Environmental Report

South Staffordshire Water
Final Water Resources Management Plan 2019
Strategic Environmental Assessment

Final Report for South Staffordshire Water Plc

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Introduction

Water companies in England and Wales are required to produce a Water Resources Management Plan (WRMP) every five years. South Staffordshire Water's Final WRMP 2019 (WRMP19) sets out how the company intends to maintain a balance between the supply and demand for water over the long-term planning horizon. South Staffs Water's last Water Resources Management Plan was approved for publication by the Secretary of State in May 2014. Consultation on the draft WRMP19 was held between March and May 2018, and a Statement of Response was published in August 2018 setting out the changes made to the plan in response to the consultation comments received.

This Strategic Environmental Assessment (SEA) Environmental Report accompanies our Final WRMP19. The SEA has been undertaken in parallel with the Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment to ensure an integrated approach to environmental assessment of the Final WRMP19.

SEA became a statutory requirement in the UK following the adoption of Directive 2001/42/EC (the SEA Directive) on the assessment of effects of certain plans and programmes on which could have significant environmental implications. The SEA helps to identify where there are potential impacts and how any negative impacts might be mitigated. The Government has produced SEA guidance which sets out the stages of the SEA process. This, along with specific water industry national guidance for undertaking SEA (and HRA) of WRMPs, has been used to inform this SEA.

Final Water Resource Management Plan 2019

South Staffs Water is a water-only company, providing high quality water services over an area of 1,500km^2 in the West Midlands, South Staffordshire, South Derbyshire, North Warwickshire and North Worcestershire areas. South Staffs Water provides drinking water to over 1.3 million people across some 500,000 households, as well as 35,000 businesses, and supplies some 331 million litres per day. The company provides a bulk water supply transfer to Severn Trent Water of 40 Ml/d for the Wolverhampton area from the River Severn, as well as a number of other small bulk exports (less than 2 Ml/d). Water is supplied through 8,300 km of water mains and fed from multiple sources including one impoundment reservoir (Blithfield Reservoir), one river abstraction with bankside storage (River Severn) and 25 groundwater sites. Groundwater sources and surface water sources (rivers and reservoirs) each provide approximately 50% of the total volume of water put into supply. For water resource planning purposes, South Staffs Water's supply area is managed under one Water Resource Zone (WRZ) as shown in Figure A below.

Figure A also indicates the geographical extent of the SEA which encompasses an area beyond the South Staffs Water supply area to include the River Severn catchment area that supports the company's abstraction from the River Severn.

Further details about the South Staffs Water supply system are provided on the South Staffs Water website (https://www.south-staffs-water.co.uk).

In developing its Final WRMP19, South Staffs Water has examined the future forecast water supply/demand balance and determined how any deficit between forecast demand and reliable water supply availability should be addressed. In developing the plan, a large number of alternative options were identified and assessed to understand their costs, their benefits to the supply-demand balance, their effect on carbon emissions and their environmental and social effects (through the SEA process and associated HRA and WFD assessments). The options were subsequently compared through a comprehensive programme appraisal process to determine the 'best value' programme of options to maintain the supply-demand balance over the planning period. Decisions on the best value programme took account of a range of factors, such as the implications for water customer bills, the resilience to future risks and uncertainties, deliverability considerations and the environmental and social effects of the programme (both adverse and beneficial effects), as informed by the SEA. Figure B below summarises the overall approach to the evolution of the Final WRMP19: from the initial "unconstrained" list of options through to the consideration of alternative programmes and the development of the Final WRMP19.

Figure A. Geographical area covered by the SEA

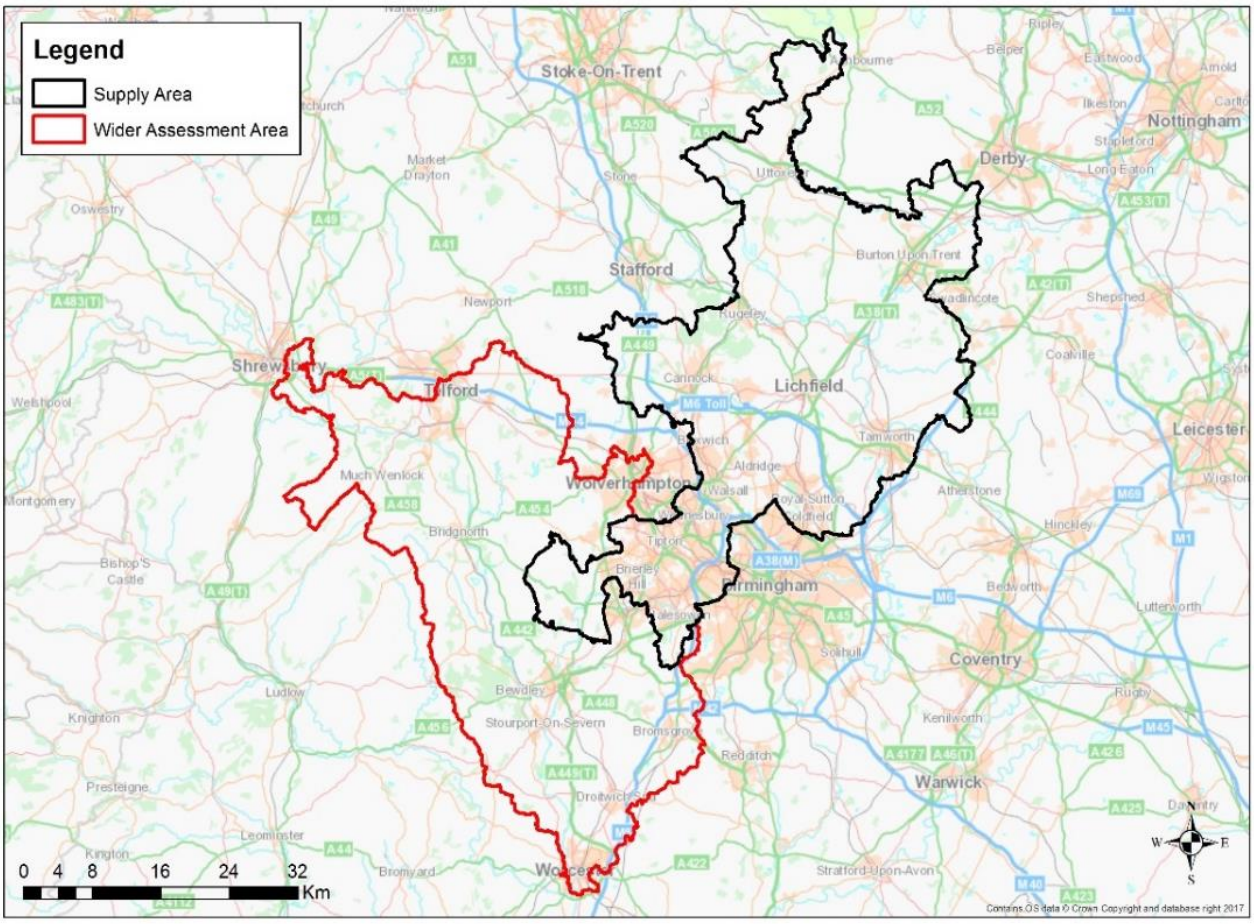
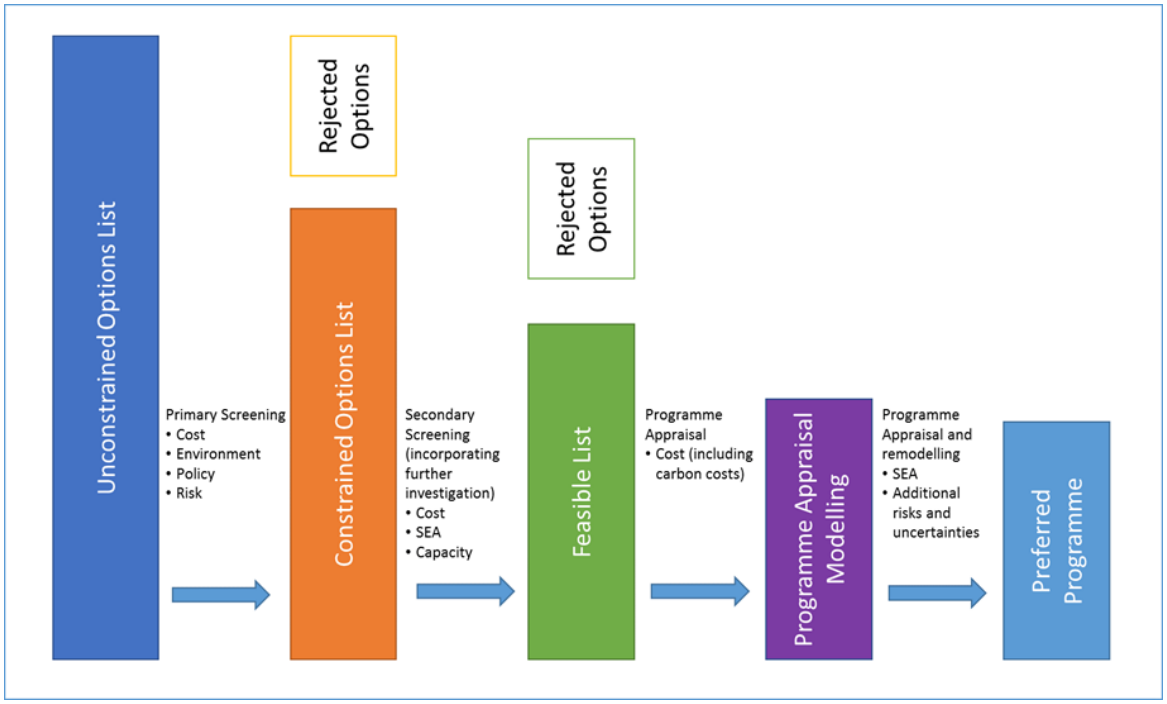


Figure B. Option screening approach

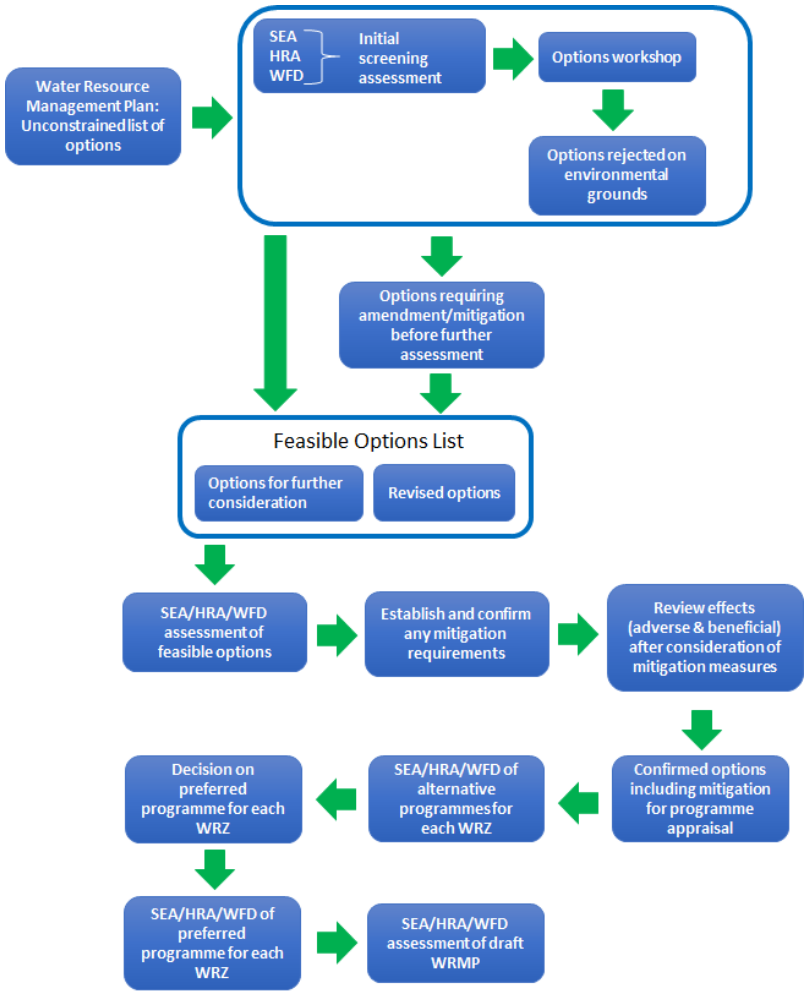


Assessment Approach

An 'objectives-led' approach was adopted for the SEA. The SEA scoping process included a review of environmental and social objectives established in law, policy or other relevant plans, programmes and a review of the baseline environmental information. This included the area covering South Staffs Water as well as the River Severn catchment upstream of the company's River Severn abstraction intake. This derived more than 80 key policy objectives to be taken into account in the development of SEA objectives. The SEA objectives were categorised under the following topic areas: biodiversity, flora and fauna; population and human health; material assets and resource use; water; soil, geology and land use; air and climate; archaeology and cultural heritage; and landscape and visual amenity. The SEA objectives were subject to public consultation through the Scoping Report and feedback from the consultation process was taken into account in developing the final SEA objectives against which each constrained option and alternative programmes were assessed.

Consideration and assessment of environmental and social effects (both beneficial and adverse) of the wide range of alternative options for maintaining water supply reliability was undertaken at each stage of WRMP development, with an increasing level of assessment detail applied as the refinement of the list of options progressed through the planning process (see Figure C below). Detailed SEA, HRA and WFD assessments were carried out for all the Feasible List options. These assessments were documented in appraisal framework tables for each option with a colour coded effects summary (ranging from major beneficial effects to major adverse effects) providing a comparative assessment of the residual environmental effects. The findings were used to inform the development of the preferred programme. To meet the requirements of the SEA Directive, cumulative effects have been assessed within the preferred programme, and between the WRMP and other relevant plans, programmes or projects.

Figure C. Integration of SEA, HRA and WFD assessment into the development of WRMP19



SEA Screening of Options

SEA screening of the very large set of options in the 'unconstrained' list was carried out initially. The screening included consideration of SEA topics as well as risks to WFD water body status and the risk of any likely significant effects on European sites designated under the Habitats Directive. This identified options with unacceptable adverse environmental effects which were rejected from the options list and were not taken forward to the next stage of the appraisal process. A further, more detailed stage of SEA (HRA and WFD) screening was then applied to the screening of the initial 'constrained' list of options. The screening assessment findings were discussed with the Environment Agency and Natural England, and feedback from these regulatory bodies was used to refine some of the assessments. Options assessed as having unacceptable adverse environmental or social effects were removed from the options list; the remaining options were included in a final 'Constrained' list.

Assessment of Feasible List Options

Each of the Feasible list options were fully assessed against each of the SEA objectives, and in compliance with statutory requirements and associated national SEA guidance. The assessments were also supported by the parallel HRA and WFD assessments, the Sustainable Economic Level of Leakage (SELL) assessment (which incorporates considerations of the environmental and social effects relating to leakage control options), carbon emissions assessment and valuation, and consideration of customer research evidence relating to environmental and social issues. South Staffs Water's Final WRMP proposed reduction takes leakage significantly below the SELL.

The SEA considered both beneficial and adverse effects of each of the options to fully understand the overall potential effects on the environment. Where applicable, mitigation measures were identified as part of the option assessment to prevent or reduce any identified significant adverse environmental or social effects. These mitigation measures were taken into account in assessing the potential residual effects on the SEA objectives. Equally, any opportunities for potential enhancement of benefits were taken into consideration.

The SEA involved detailed assessment of the potential adverse and beneficial effects of the option design, construction/development and operation against each of the SEA topics and objectives using an effects magnitude scale ranging from major beneficial to major adverse. A summary of the key findings of the SEA is provided below.

Demand Management Options

The Demand Management options comprise measures to reduce leakage (principally, active leak detection and repair activities and further actions to manage water pressure in the water supply system) and encourage greater water efficiency by customers (including further water metering of customers, changes to tariff structures to incentivise water efficiency and promotion of water efficient devices). Overall, demand management options serve to reduce pressure on water resources by reducing customer demand for water and thereby helping to reduce the volumes of water abstracted from the water environment. This, in turn, also contributes to reducing the amount of energy needed for water abstraction, treatment and distribution. The leakage and metering options have some limited, temporary adverse effects associated with vehicle movements and associated temporary disruption from working in streets to repair leaks or driving vehicles as part of meter installations.

Water Supply Options

Overall, the assessment of the water supply options revealed a wide spectrum of beneficial and adverse effects.

- **Groundwater options** may influence local groundwater levels and connected surface water bodies, with potential risk to some water-dependent habitats. Potential effects on water levels and/or surface water flows could affect other water-dependent receptors such as heritage or landscape features. However, the groundwater options generally require only small-scale infrastructure development and have relatively limited potential for other adverse effects, apart from those associated with materials use and energy linked to the abstraction and treatment of water.
- **Large reservoirs and abstraction and transfer options** exhibit the greatest magnitude of adverse effects relating to construction as well as risks of potential permanent adverse effects on

landscape, local communities and heritage features. Conversely, these options bring benefits in respect of securing significant additional reliable water supplies that are more resilient to climate change effects. These options range from adapting existing reservoirs (e.g. Blithfield Reservoir) to the construction of new large storage reservoirs.

- Three variants of an option that involves the purchase of a proportion of the **Shropshire Groundwater Scheme** abstraction licence volumes from the Environment Agency have relatively limited adverse effects compared with the benefits associated with the potential additional reliable water supply provided. The adverse effects are associated with construction and materials use and energy consumption linked to the abstraction and treatment of water.
- Two options to **import water from other water companies** have limited potential for adverse effects (other than energy linked to the abstraction and treatment of water) and moderate beneficial effects associated with the provision of additional reliable water supplies.

Programme Appraisal

The programme appraisal process initially involved the generation of a 'least-cost' programme using a water resource management cost optimisation model. Certain environmental and social effects were monetised and included in the option costs input to this model. South Staffs Water used the outputs from the optimisation model along with the findings of the SEA option appraisal (as well as the HRA and WFD assessments) and other factors such as regulatory requirements, customer preferences, risk and reliability, to identify a short-list of reasonable alternative programmes. To avoid double counting of effects, those effects identified in the SEA that had been monetised in the optimisation model (e.g. carbon) were not considered when reviewing the SEA findings to reach decisions on the short-listed programmes.

The alternative short-listed programmes were assessed through the programme-level SEA to help inform decisions on the preferred programme to be included in the Final WRMP19.

Figure D below summarises the environmental effects of the preferred programme and identifies those effects that have been partly represented by environmental and social costs in the programme appraisal model. In general, the demand management components of the preferred programme will bring a wide range of beneficial effects with mostly negligible adverse effects.

One water supply option is included in the preferred programme. The SOPW and SHPW option (option 1.4.1) involves asset refurbishment work, new water treatment works, a new effluent pipeline and a new pumping station. The assessment identified potential moderate adverse effects associated with the construction phase for these assets. Moderate adverse effects with respect to biodiversity, fauna and flora relate to two small areas of Ancient Woodland that would be in close proximity to the proposed pipeline: this will require consideration of further mitigation measures (e.g. re-routing) as part of the detailed scheme design to ensure the woodland and associated root zone is not adversely affected. The scheme will result in an estimated permanent land take of 1ha which may result in a loss of non-designated habitat, with potential for some minor habitat fragmentation. Moderate adverse effects were identified with respect to temporary impacts on population and human health in relation to recreation amenity as construction of the pipeline could result in short term severance of public rights of way and disturbance to places of interest including the Shropshire Union Canal. Negligible to minor adverse operational effects were identified in relation to increased pumping of water consistent with recent historic abstraction levels. Negligible beneficial effects have been identified, mostly relating to the provision of a small volume of additional reliable water supplies.

Figure D. SEA evaluation summary of the final WRMP19 preferred programme

Scheme		SEA Topics and Objectives																					HRA Screening	WFD Assessment
		Biodiversity				Population and Human Health			Material Assets and Resource Use		Water					Soil, Geology and Land Use			Air and Climate			Archaeology and Cultural Heritage	Landscape and Visual Amenity		
		1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	
Effects wholly or partially captured in environmental and social costs						✓													✓					
Leakage reduction measures	Adverse																							No LSE	Compliant
	Beneficial																							
Enhanced free meter optants	Adverse																							No LSE	Compliant
	Beneficial																							
Scheme 1.4.1 SHPW and SOPW	Adverse																							No LSE	Compliant
	Beneficial																							

Cumulative Effects Assessment of the Final WRMP19

Cumulative beneficial effects have been identified for all the demand management options as they will act in combination to reduce demand for water, thereby contributing to sustainable abstraction. The cumulative benefits will help reduce stress on the water environment at times of low flows as well as the water settings of heritage and landscape features. They will also help to reduce energy use for water pumping and treatment. There is a small risk that simultaneous implementation of the demand management options could lead to some minor cumulative adverse effects, whereby disturbance to human health, increased resource use and greenhouse gas emissions arise due to leak repair and associated water network enhancement activities. However, the cumulative effect of these activities would be localised and small in scale, and could be effectively mitigated through careful project management and best practice construction methods.

As only one water supply option is included in the preferred programme, there are no in-combination effects.

Cumulative effects with other relevant plans, programme and projects

Cumulative effects of the Final WRMP19 with other relevant plans, programmes and projects have included assessment of the following:

- South Staffordshire Water Draft Drought Plan 2017
- Neighbouring water companies' draft 2019 WRMPs and published Drought Plans
- River Basin Management Plans
- Environment Agency Drought Plans
- Canal & River Trust Management Plans
- Local Development Plans
- National Policy Statements and National/Regional Infrastructure Plans
- Major projects.

The information used to carry out these assessments is considered to be the most up to date information available at the time of writing, but the assessments should be reviewed at the time of option

implementation to ensure that no changes to the Plans have been made in the intervening period, and that the assessment, therefore, remains valid.

Cumulative effects with the Draft Drought Plan 2017

No cumulative effects with the South Staffs Water draft Drought Plan 2017 have been identified. The draft Drought Plan includes a number of supply-side measures to ensure that existing water sources are fully operational, to maximise the use of enhanced groundwater treatment sites and to review the bulk water supplies between Severn Trent Water and South Staffs Water. No cumulative effects are considered likely with respect to these measures and the Final WRMP19 option to improve and enhance the SHPW and SOPW source outputs. Whilst this WRMP scheme will involve additional abstraction compared to the current baseline environmental conditions, the assessment of the effects of this scheme in the SEA assumed that all other existing South Staffs Water sources are operating at their full licensed (or asset constrained) outputs in dry weather conditions – it is against this baseline that the effects have been assessed. Consequently, there are no additional cumulative effects to be taken into consideration with respect to the draft Drought Plan measures to maximise use of existing sources.

The 2017 draft Drought Plan also includes several site-specific drought permit options; however, these are associated with the River Blithe or Blithfield Reservoir located more than 20km distant from the water supply option in the South Staffs Water Final WRMP19 preferred programme and therefore the potential for cumulative effects is considered negligible

Cumulative effects with other water company plans

South Staffs Water's supply boundary is surrounded by Severn Trent Water's supply area. Severn Trent's Revised Draft WRMP19 and draft Drought Plan 2018 have been assessed. Severn Trent Water's plans (as at September 2018) do not include any supply-side options that would have the potential to lead to any cumulative construction or operational adverse effects. Severn Trent Water's revised draft WRMP19 and draft Drought Plan 2018 includes various demand management components, similar to those included in South Staffs Water's Final WRMP 2019. Improved water efficiency across the Midlands will provide beneficial cumulative effects in terms of reduced consumption and water abstraction, as well as reduced energy use due to less water pumping and treatment.

Cumulative effects assessment with other water company revised draft WRMP19s and published Drought Plans that may also impact (directly or indirectly) on the River Severn or River Trent catchment areas relevant to South Staffs Water has been carried out, involving consideration of the following water company plans (as at September 2018): United Utilities, Yorkshire Water, Welsh Water, Thames Water and Bristol Water. This assessment concluded that no cumulative adverse effects are anticipated in relation to any of these other water company plans and the options included in the South Staffs Water final WRMP19 preferred programme. There may be cumulative beneficial effects in respect of water efficiency measures included in all of the plans in helping to promote water conservation messages across the Midlands and surrounding areas.

Cumulative effects with other plans

No adverse cumulative effects have been identified between the Severn River Basin District and Humber River Basin District River Basin Management Plans and the Final WRMP19. The demand management options in the Final WRMP19 may have cumulative beneficial effects in supporting some of the River Basin Management Plans objectives.

The Final WRMP19 does not include any options that will have any cumulative significant environmental effects with the measures included in the Environment Agency's Drought Plans. External drought management communications by the Environment Agency during drought may have beneficial cumulative effects with South Staffs Water's demand management options in the Final WRMP19, reinforcing the importance of water efficiency to the public.

No adverse cumulative effects between the Canal & River Trust Water Resources Strategy and the options included in the Final WRMP19 have been identified.

There is potential for cumulative effects with outline measures in one Local Development Plan in relation to the SOPW and SHPW scheme (Option 1.4.1) which has been identified as resulting in potential for moderate adverse effects associated with construction. The South Staffs Local Plan proposes that the

majority of future development and service provision in the area should be focused on the Main Service Villages. Cumulative construction effects would however only arise if the timing of the construction works for the scheme were to coincide with housing or economic development construction works. If such timing overlap arises, it is anticipated that these impacts could be effectively mitigated through appropriate scheduling of all the construction required to avoid any concurrent works that might lead to significant environmental effects.

The West Midlands Interchange project involves construction of an inter-modal rail freight terminal with connections to the West Coast Main Line, container storage on land located on land at Four Ashes (Staffordshire). This major project is located within 5km of the SOPW and SHPW option. Cumulative construction effects would only arise if the location and timing of the construction works required for the scheme were to coincide with the Interchange project. It is anticipated that these impacts could be effectively mitigated through appropriate scheduling of all the construction required so as to avoid any concurrent works that might lead to significant environmental effects.

Habitats Directive and Water Framework Directive Assessments

The Habitats Regulations Assessment (HRA) has concluded that the Final WRMP19 is compliant with the Habitats Directive, with no likely significant effects on any European sites anticipated.

The Water Framework Directive (WFD) assessments have concluded that the Final WRMP19 meets the WFD Regulations and associated objectives with the application of appropriate mitigation measures.

Consideration of Reasonable Alternatives

South Staffs Water considered a range of reasonable alternative programmes to balance supply and supply over the planning period. The environmental and social performance of these alternative programmes was considered, alongside other key factors, to help determine the preferred programme for the Final WRMP19. The preferred programme focuses on measures to increase demand management and leakage reduction activities, reflecting customer and stakeholder expectations. The inclusion of these demand management measures in the preferred programme resulted in a draft plan with greater environmental beneficial effects and fewer adverse effects than would arise from the least-cost plan.

Through the assessment of several reasonable alternative programmes, the SEA has also identified that feasible alternative schemes exist that could be developed with acceptable environmental and social effects that are broadly comparable to those of the schemes included in the Final WRMP19. In this way, 'substitute' schemes are available for consideration should this prove necessary during implementation of the plan over the planning period.

Mitigation and enhancement

Mitigation may be defined as a measure to limit the effect of an identified significant impact or, where possible, to avoid the adverse impact altogether. Consideration of mitigation measures has been an integral part of the SEA process and has informed development of the Final WRMP19. The SEA appraisals have been based on the assessment of residual effects likely to remain after the implementation of identified mitigation measures associated with each option. Additional site specific mitigation measures have however been identified to address some residual moderate adverse effects with respect to the SOPW and SHPW option during construction.

The proposed mitigation measures would be implemented through the planning processes. Construction Environmental Management Plans would be developed to ensure the mitigation measures (and associated effects monitoring) are in place during construction activities. In this way, effective mitigation plans can be developed to minimise many of the residual adverse effects currently identified in the SEA.

Monitoring of effects during plan implementation

The natural, built and human receptors potentially impacted by development and operation of the schemes included in the Final WRMP19 have been set out in the table below alongside proposed monitoring indicators of effects. These proposed monitoring indicators would form the core component of a SEA monitoring programme to assess whether the identified effects in the SEA are occurring as anticipated, or whether it is giving rise to greater or lesser effects (adverse or beneficial). In turn, the

monitoring may identify changes to the mitigation measures necessary to minimise adverse effects and/or modifications to scheme design or operation to further augment beneficial effects.

Impacted Receptor	Monitoring Indicator	Information Source	Responsibility
Water resources, water quality, biodiversity	Proportion of surface waters and groundwater waterbodies at 'Good' WFD status	Environment Agency online Catchment Data Explorer	Environment Agency
	Protected species and habitats surveys	Site-specific monitoring during detailed design stage to confirm presence/likely absence of protected species	South Staffs Water
	Biological monitoring (macrophytes, macroinvertebrates, fish)	Environment Agency database plus site-specific monitoring completed by South Staffs Water	Environment Agency, South Staffs Water
	Condition of European Sites and SSSIs according to Natural England condition assessments	Natural England favourable condition assessment tables	Natural England
	Progress against the South Staffs Water biodiversity targets	Biological monitoring and surveys	South Staffs Water
	Surface water and groundwater levels	Monitoring and comparison with historic records	South Staffs Water, Environment Agency
Climate Factors	Net greenhouse gas emissions per Ml (million litres) of treated water (kg CO2 equivalent emissions per Ml)	Reported annually by South Staffs Water	South Staffs Water
Transport	Transport fleet fuel consumption, emissions and mileage	Routinely monitored by South Staffs Water	South Staffs Water
Nuisance/ Community Amenity Effects	Scheme level community disruption due to construction works / during operation (where applicable)	Monitored through an Environmental Management Plan	South Staffs Water
	Complaints logged during construction	Compile data held by South Staff (and contractors) and Local	South Staffs Water, Local Authority

Impacted Receptor	Monitoring Indicator	Information Source	Responsibility
		Authority Environmental Health Officer	
	Customer satisfaction surveys	Responses gauged through and reported in South Staffs Water's annual performance processes	South Staffs Water
	Surveys of recreational and other amenities likely to be affected	Survey responses pre- and post- construction	South Staffs Water
Air Quality	Scheme-specific monitoring during construction works / during operation (where applicable)	Environmental Management Plan	South Staffs Water
	Changes in background air quality	Defra Automatic Urban and Rural Network, Local Authority monitoring	Defra, Local Authority data sources
Resource Use	Proportion of demolition materials sent to land fill or recycled	Part of Construction Environmental Management Plan	South Staffs Water (contractors)
	Proportion of construction build materials derived from recycled materials	Part of design criteria for new builds	South Staffs Water
Landscape and visual amenity	Loss of land within AONB, National Park or protected views	Landscape and Visual Impact Assessments	Complete assessments in consultation with Natural England, Local Authority and Historic England
	Changes to townscape and views	Townscape assessment	As above
Cultural Heritage	Loss or change in condition of buried archaeology	Archaeological Written Scheme of Investigation Environmental Management Plan	Complete assessment in consultation with Historic England and Local Authority South Staffs Water
	Change in condition of existing heritage assets	Monitoring of heritage assets such as Listed Buildings and Scheduled Monuments, Registered Battlefields, Registered Parks and Gardens, in particular the 'Heritage at risk' register.	Historic England

As the WRMP19 options are brought forward for development, further specific monitoring requirements may be set out in the detailed design accompanying scheme development (including scheme-specific HRA and WFD assessments). These will be discussed with relevant regulatory and statutory bodies and stakeholders to agree the appropriate scale and duration of the scheme-specific monitoring activities proportionate to the assessed environmental risks.

Conclusions

Through application of the SEA process (and associated HRA and WFD assessments) from the very outset, South Staffs Water has actively considered environmental and social effects throughout the development of its Final WRMP19 and consulted regularly with regulators, stakeholders and customers to seek their views on the emerging findings. The SEA process complies with the regulatory requirements and national best practice guidance. The assessments have been based on a broad range of objective environmental and social criteria, developed through public consultation, to ensure all options were considered on a consistent basis, in line with the meeting the requirements of the SEA Directive and national SEA Regulations.

By integrating environmental and social assessment into the development of the Final WRMP19, a long-term sustainable water resource plan has been produced that maintains water supply reliability for South Staffs Water's customers without unacceptable adverse effects on the environment or local communities.

As well as protecting the environment, the Final WRMP19 provides opportunities for environmental enhancement through various measures, in particular:

- Actively pursuing further measures to reduce leakage from the water supply system and customer properties, reducing water abstraction from the environment
- Extending the promotion of free water meters to more customers and helping customers reduce their demand for water.

Consultation

South Staffs Water formally invited the statutory consultation bodies, stakeholders and the public to comment on the draft WRMP19 and the SEA Environmental Report in early 2018 (March to May 2018). Comments made have been considered in producing the Final WRMP and this final Environmental Report, acknowledging that environmental and social considerations are not the only determining factors in formulating the WRMP.

Once the Final WRMP has been published, South Staffs Water will also publish a SEA Statement, describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP. This statement will describe how environmental considerations have been integrated in the WRMP and explain any changes made or alternatives rejected. Information will also be provided on the environmental monitoring to be carried out during the implementation of the WRMP to track the environmental effects of the WRMP and to trigger appropriate responses where effects are identified.

1 Introduction

1.1 Background and Purpose of Report

Water companies in England and Wales are required to produce a Water Resources Management Plan (WRMP) every five years. The Plan sets out how the company intends to maintain the balance between supply and demand for water over the long-term planning horizon in order to ensure security of supply in each of the water resource zones making up its supply area.

This Strategic Environmental Assessment (SEA) Environmental Report has been prepared in support of the development of South Staffs (South Staffs) Water's Final WRMP 2019. Habitats Regulations Assessment (HRA) Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment have also been carried out in parallel to ensure an integrated approach to environmental assessment.

SEA is a statutory requirement for plans or programmes which could have significant environmental implications, and helps to identify where there are potential impacts and how any negative impacts might be mitigated. More information about SEA, and its role in supporting the development of the draft Water Resources Management Plan, is provided in Section 1.2.

This Environmental Report is the second output of the SEA process. In April 2017, the SEA Scoping Report was issued for consultation which summarised the environmental baseline and set out the proposed assessment framework. Comments and issues raised by consultees have been considered in preparing this Environmental Report (see Appendix A).

The Environmental Report presents the review of relevant policies and plans (Section 2 and Appendix B) and the baseline environment information (Section 3 and Appendix C) that set the context for the assessment that has been carried out in accordance with the assessment methodology (Section 4). High level environmental screening to establish the constrained and feasible list of options is described in Section 5. The potential effects of alternative Water Resources Management Plan options are described in Section 6, and the Final WRMP programme appraisal is presented in Section 7. The assessment of the cumulative effects between Final WRMP 2019 options and other activities, programmes and plans set out in Section 8. Section 9 explains how the SEA findings have been used to inform the development of the draft Water Resources Management Plan. Information regarding mitigation and monitoring is provided in Section 10. SEA quality assurance is provided in Section 11.

This SEA Environmental Report accompanies the submission of South Staffs Water's Final Water Resources Management Plan to Defra.

1.2 Application of SEA to Water Resource Management Planning

1.2.1 Overview of Strategic Environmental Assessment

SEA became a statutory requirement in the UK following the adoption of Directive 2001/42/EC (the SEA Directive) on the assessment of effects of certain plans and programmes on the environment. The Directive was transposed into national legislation by The Environmental Assessment of Plans and Programmes Regulations 2004 (referred to as the SEA Regulations).

The objectives of SEA are set out in Article 1 of the SEA Directive as follows:

> *'to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development'.*

The SEA Directive requires preparation of an Environmental Report in which the likely significant effects on the environment of implementing the plan or programme, and reasonable alternatives taking into account the objectives and geographical scope of the plan or programme, are identified, described and evaluated. It should be noted that, as stated in the Office of the Deputy Prime Minister (ODPM) SEA

Guidelines, “it is not the purpose of the SEA to decide the alternative to be chosen for the plan or programme. This is the role of the decision-makers who have to make choices on the plan or programme to be adopted. The SEA simply provides information on the relative environmental performance of alternatives, and can make the decision-making process more transparent. The SEA process has therefore been used to help inform decision making, including the selection of options, and the timing and implementation of Water Resources Management Plan options within the plan, as well as the consideration of appropriate monitoring and mitigation of identified environmental and social effects.

The range of environmental and social issues to be included in an SEA is set out in the SEA regulations, and includes biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage, and landscape.

As identified above, the Government has produced SEA guidance which sets out the stages of the SEA process. This, along with specific guidance for undertaking SEA and Habitats Regulations Assessment (HRA) of WRMPs, is being used to inform the SEA of South Staffs Water's WRMP. The 2016 Final Water Resources Planning Guideline (WRPG) also provides guidance on the role of SEA within the water resources management planning process.

These guidance documents and regulations have all informed South Staffs Water’s Final Water Resources Management Plan 2019 and the SEA.

1.2.2 Requirement for SEA and HRA of South Staffs Water’s Water Resources Management Plan

The SEA Scoping Report issued in 2017 set out the reasons why an SEA of the South Staffs Water’s Water Resources Management Plan was required. The Scoping Report concluded that an SEA is required when taking into account a precautionary approach and uncertainties associated with whether the plan is likely to set a framework for future development consent and the risk that the Habitats Regulations Assessment (HRA) would identify the potential for likely significant effects on certain Natura 2000 sites. A HRA has since been undertaken which accompanies the Final Water Resources Management Plan and which has informed the SEA.

Undertaking a SEA of the Final Water Resources Management Plan has aided its development and South Staffs Water’s decision-making on the options to be included in the final preferred plan, their timing and phasing taking account the assessed environmental and social effects (adverse and beneficial). The application of the SEA (and HRA) have helped ensure strategic decisions affecting the environment were made early on in the Water Resources Management Planning process.

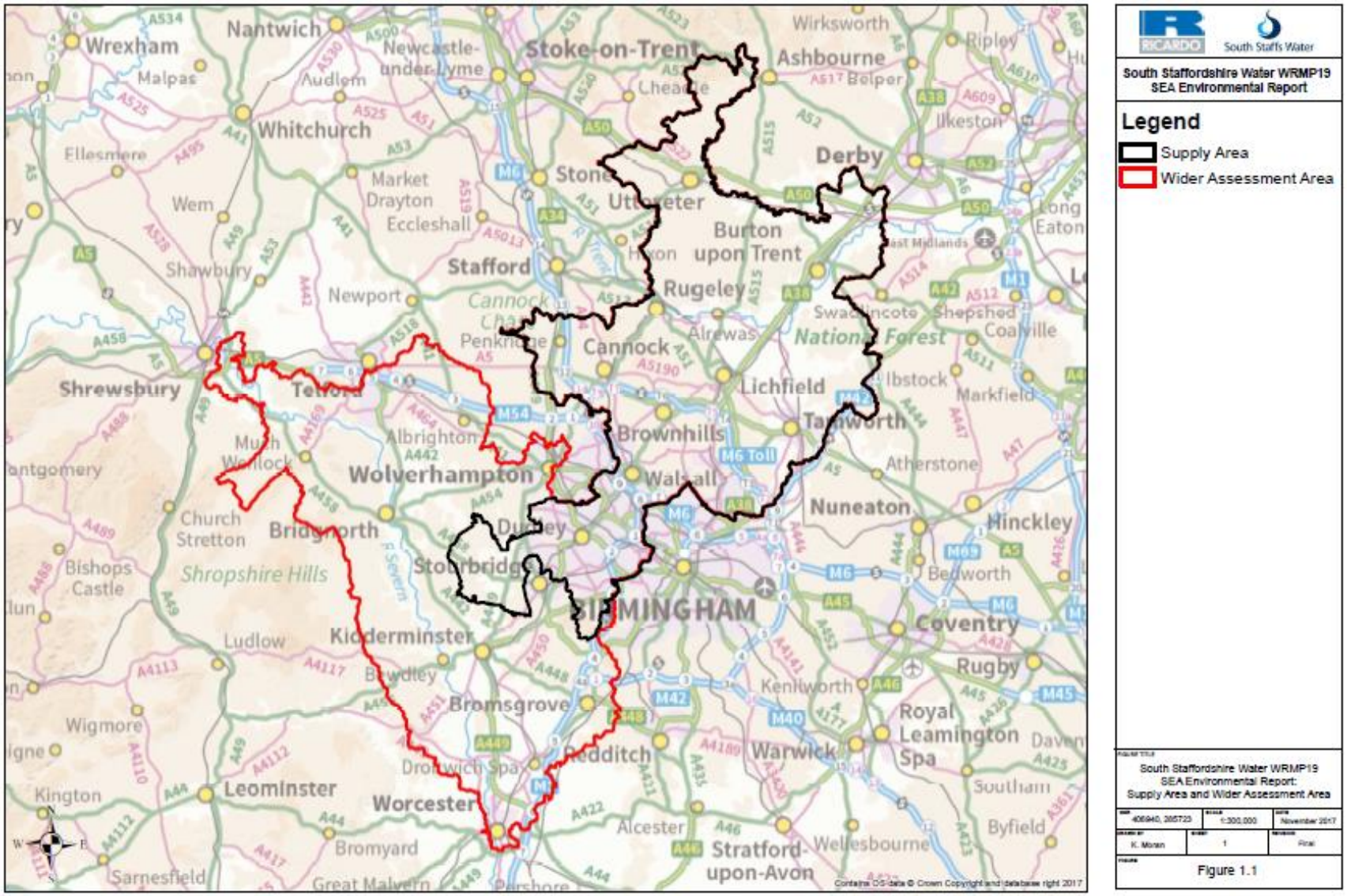
1.3 South Staffs Water Supply Area and Water Resources Management Planning

1.3.1 South Staffs Water Supply Area

South Staffs Water is a water only company, providing high quality water services over an area of 1,500 square km in the West Midlands, South Staffordshire, South Derbyshire, North Warwickshire and North Worcestershire areas. South Staffs Water provides drinking water to over 1.3 million people (> 500.000 households and 35,000 businesses, supplying 331 million litres per day including Severn Trent bulk supply of 40 Ml/d for Wolverhampton and a number of other small bulk exports (less than 2 Ml/d) (see Figure 1.1). Water is supplied through 8,300 km of water mains and fed from multiple sources including one impoundment reservoir (Blithfield Reservoir), one river abstraction with bankside storage (River Severn) and 25 groundwater sites. Groundwater sources and surface water derived sources (rivers and reservoirs) each provide approximately 50% of the total volume of water put into supply.

For water resource planning purposes, South Staffs Water's supply area is managed under one Water Resources Zone (WRZ) (Figure 1.1). Further details about the South Staffs Water supply system are provided on the South Staffs Water website (https://www.south-staffs-water.co.uk).

Figure 1.1 South Staffs supply area and area under consideration in the SEA



1.3.2 Area under consideration for the SEA

Development of the WRMP will involve a sequential process to determine the preferred programme of water supply and demand management options to maintain a supply-demand balance. Sections 4 and 5 explain in more detail how SEA informs the process, and includes the feasible list of options currently under consideration for the Final WRMP. For the SEA, the assessment area includes the South Staffs water supply area and the Middle Severn management catchment, where there are existing or proposed sources of water for the company (e.g. the Company's River Severn Works source). The area under consideration for the SEA is also shown in **Figure 1.1**.

1.3.3 Temporal scope of the SEA

As discussed earlier, the temporal scope of the WRMP must cover a minimum statutory planning period of 25 years. In Section 3 of this Environmental Report and Appendix C, the current environmental and social baseline for the SEA geographical area under consideration is described together with the likely future changes to this baseline as currently understood. Over the long-term planning horizon of the WRMP, there is uncertainty as to how the future baseline will evolve. Consequently, it is sensible to adopt a scenario approach to test the sensitivity of the WRMP against the central assessment of environmental and social effects based on the known or likely changes to the baseline conditions. In this way, the resilience of the WRMP options, programmes and the overall plan can be assessed and used to inform decision-making as well as recommendations for future monitoring to provide data for subsequent WRMPs and the associated SEA.

In considering this approach to the future environmental and social baseline, it is important to recognise that WRMP options for implementation beyond 2025 will be further assessed by South Staffs Water through the next statutory WRMP due to be published in 2024; this will also be subject to SEA. This process is currently assumed to be repeated every subsequent five years. This regular statutory update and review will ensure that actual changes to the baseline and updated forward projections can be taken into account in subsequent WRMPs and SEAs.

1.4 South Staffs Water Resource Management Planning Process

1.4.1 Overview and Timetable

Water resources management planning is undertaken by all water companies in England and Wales in order to ensure reliable, resilient water supplies over the long-term planning horizon. The process includes calculating and forecasting how much water customers will need over the planning period (assessing demand) and how best to provide it (assessing options to reduce or constrain demand growth and/or augment reliable supplies of water) in an efficient, timely manner (programme appraisal). Companies seek to identify the preferred, 'best value' programme of demand management and water supply options to maintain a balance between reliable supply and demand in each WRZ and for their supply area as whole (the WRMP).

Water companies in England and Wales have a statutory requirement to prepare a WRMP every five years; the next WRMP must be submitted in draft to the Secretary of State by the 1 December 2017 to seek her agreement for issuing for public consultation during early 2018, with the final plan submitted for approval to the Secretary of State in late 2018. The WRMP also informs the regulatory water company business planning 'Periodic Review' process through which the Water Services Regulation Authority (Ofwat) sets the prices that water companies can charge their customers for water (and wastewater) services. The next Periodic Review will be in 2019.

Engagement with government, regulators, other licensed water suppliers and water companies, customers and a wide range of stakeholders is key to the WRMP process. South Staffs Water's WRMP19 consultation programme commenced in 2016 and includes a wide range of stakeholders and the regulators. Consultation will continue throughout the next few years as the WRMP19 continues to be developed. The Final WRMP 2019 was published for formal public consultation in early 2018 (March to May), accompanied by the SEA Environmental Report.

Following comments on the draft WRMP 2019 and SEA Environmental Report, a Statement of Response was prepared by South Staffs Water, setting out how it intends to take account of the comments received in producing a Final WRMP for the Secretary of State's approval. The Statement of Response was published in August 2018.

In developing its WRMP19, South Staffs Water examined the future forecast water supply/demand balance and determined how any deficits between forecast demand and reliable water supplies should be addressed for the selected planning period.

1.4.2 Water resource Management Plan Development

There are several future key challenges faced by South Staffs Water in providing reliable and secure water supplies to its customers. These include increasing population in some areas, the potential effects of climate change, and possible "sustainability reductions" to the availability of water supplies from various existing water sources to help meet Water Framework Directive (WFD) requirements to deliver good ecological status for waterbodies.

As a result of these various pressures, actions are likely to be required by South Staffs Water to maintain sustainable and secure water supplies to customers. These actions could include measures to reduce the demand for water and/or develop additional water supply availability. A wide range of demand and supply measures will be considered initially, which will then be narrowed down to a smaller number of options for more detailed evaluation.

The planning process considers key issues which affect future water supply reliability and demand for water, such as:

- population and housing growth
- water consumption behaviour and how these may change in the future
- climate change implications for reliability of water supplies
- reductions to the availability of water supplies due to environmental impact of existing water source abstractions ('sustainability reductions')
- raw water quality deterioration due to land use and/or climate change

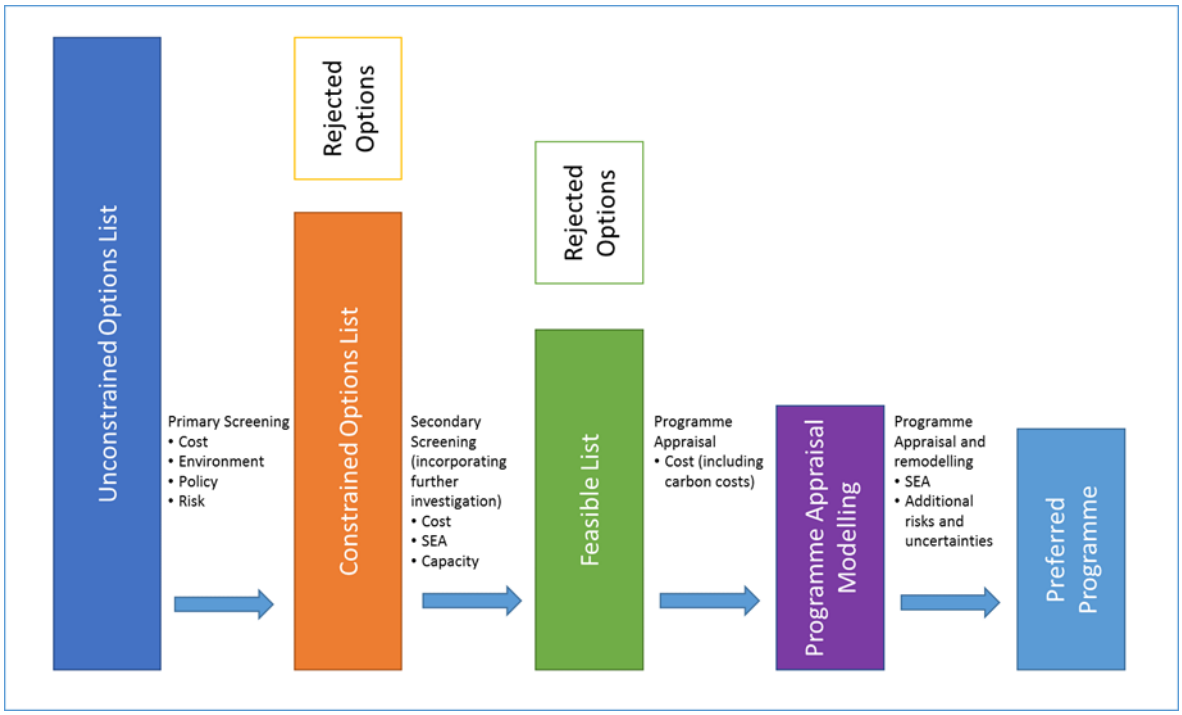
A wide range of alternative options have been considered by South Staffs Water to address any forecast supply shortfalls, including:

- alternative water tariffs to encourage water efficiency
- promotion of water efficiency measures
- reducing water leakage from the water supply network or at customers' properties
- water transfers from other water companies or other owners of water sources
- water reuse
- changes to river or groundwater abstraction
- raising the level of existing reservoir
- increased transfer of water between WRZs

Each of these options is assessed to understand the costs, the benefits to the supply-demand balance, the effect on carbon emissions, meeting customer preferences and the environmental and social effects (through the SEA process and associated HRA and WFD assessments). The options are subsequently compared through a comprehensive programme appraisal process to determine the 'best value' programme of options to maintain a supply-demand balance over the planning period for each WRZ. Decisions on the best value programme will take account of a range of factors, such as the implications for water bills, the resilience to future risks and uncertainties (e.g. climate change), deliverability considerations and the environmental and social effects of the programme (adverse and beneficial, as informed by the SEA). The programmes developed form the WRMP.

The UKWIR Guidance on integrating SEA into WRMPs and the WRPG provide clear direction on how SEA outputs should be used in options and programme appraisal. **Figure 1.3** summarises the overall approach to the evolution of the WRMP from initial 'unconstrained' list of options through to the preferred programme for South Staffs Water. Costing in the second step of screening involved both engineering; and environmental and social costing. Sections 4, 5 and 9 of this Environmental Report explain in more detail how the SEA actively informs the WRMP process at each key stage.

Figure 1.3 WRMP Options and Programme Appraisal



1.4.3 Water Resource Management Options

South Staffs Water investigated a wide range of potential options to balance future supply and demand. These were assessed as to their practicability and feasibility from which a 'constrained' list and subsequently a 'feasible' list of options was produced. There are two broad categories of water resources management options: demand management options and supply options, as described below.

Demand management options are designed to reduce the demand for water. The demand management options considered in developing the WRMP19 are largely targeted at leakage detection, management and control, water efficiency measures and metering improvements.

In parallel with this, supply options have been investigated to meet the forecast shortfall of water over the planning period. Potential supply options that have been considered in developing the draft Water Resources Management Plan are listed in Table 1.1. Benefits of these options are expressed in terms of Dry Year Annual Average (DYAA) and/or Dry Year Critical Period (DYCP) volumes in million litres per day (Ml/d).

Table 1.1 Potential supply options

Option Ref.	Option name	Benefits (Ml/d)
1.1.1	New BH KIPW1	0 DYAA; 9.0 DYCP
1.1.3a	New BH HIPW	0 DYAA; 5.0 DYCP
1.1.3b	New BH HIPW with nitrate	0 DYAA; 5.0 DYCP
1.1.7	SSPW	4.9 DYAA and DYCP
1.1.9	Warton	2.0 DYAA; 2.5 DYCP
1.1.10	SAPW	4.9 DYAA and DYCP
1.1.12	SOPW	1.5 DYAA and DYCP
1.4.1	SOPW/SHPW	6.4 DYAA; 7.0 DYCP
1.4.5	Coven	1.9 DYAA; 2,8 DYCP
6.1.1	Trent 40	20.0 DYAA; 40.0 DYCP
6.1.3	Trent 70	49.0 DYAA; 70.0 DYCP
1.3.2	TVPW Borehole to Central Works	0 DYAA; 5.0 DYCP
2.1.1	40 Ml/d Trent	3.0 DYAA
2.2.1	Dam height Blithfield	8.5 DYAA
2.2.2	Dam height 2m Blithfield	18.0 DYAA
7.1.2	CRT Bham Blithfield	0 (5.0 benefit in normal year conditions only)
7.3.1	SGW River Severn Works	20.0 DYAA
7.3.2	SGW River Severn Works	50.0 DYAA
7.3.3	SGW River Severn Works phases 6,7 & 8	80.0 DYAA
7.5.1	UU River Severn	30.0 DYAA

1.4.4 Supporting Information

For each option, baseline information was collated to permit SEA, WFD and HRA assessments to be completed, focusing on:

- Analysis of the environmental and hydrological issues
- Strategic assessment of the residual environmental effects after mitigation (including construction/implementation and operational effects)
- Assessment of secondary, cumulative and synergistic effects
- Identification of potential monitoring requirements.

Information to support the SEA was drawn from developing option engineering and water resources information (engineering proforma) and environmental screening for each option (see Section 5 and Appendix D), these initial screening assessments together with the WFD assessment informed not only the SEA, but also the HRA which itself informed the SEA.

1.5 Stages of Strategic Environmental Assessment

SEA incorporates the following stages:

- Stage A: Setting the context, identifying objectives, problems and opportunities, and establishing the baseline – Scoping Report published in April 2017.
- Stage B: Developing and refining options and assessing effects (impact assessment)
- Stage C: Preparing the Environmental Report (recording results)
- Stage D: Consulting on the Draft Plan and the Environmental Report (seeking consensus)
- Stage E: Monitoring the significant effects of the plan or programme on the environment (verification)

This Environmental Report encompasses Stages B and C of the SEA process, which is being issued for public consultation (Stage D) alongside the draft Water Resources Management Plan.

Table 1.2 is an extract from the ODPM Practical Guide[1] that sets out the main stages of the SEA process and the purpose of each task within the process. Specific guidance on the application of the SEA process to WRMPs is provided by UKWIR (2012)[2].

Table 1.2 SEA Stages and Tasks

Stage / Task	Purpose
Stage A: Setting the context and objectives, establishing the baseline and deciding on the scope	
Task A1. Identifying other relevant plans, programmes and environmental protection objectives	To establish how the plan or programme is affected by outside factors to suggest ideas for how any constraints can be addressed, and to help identify SEA objectives.
Task A2. Collecting baseline information	To provide an evidence base for environmental problems, prediction of effects, and monitoring; to help in the development of SEA objectives.
Task A3. Identifying environmental problems	To help focus the SEA and streamline the subsequent stages, including baseline information analysis, setting of the SEA objectives, prediction of effects and monitoring.
Task A4. Developing SEA Objectives	To provide a means by which the environmental performance of the plan or programme and alternatives can be assessed.
Task A5. Consulting on the scope of the SEA	To ensure the SEA covers the likely significant environmental effects of the plan or programme.
Stage B: Developing and refining alternatives and assessing effects	
Task B1. Testing the plan or programme objectives against SEA objectives	To identify potential synergies or inconsistencies between the objectives of the plan or programme and the SEA objectives and help in developing alternatives.
Task B2. Developing strategic alternatives	To develop and refine strategic alternatives.

[1] Office of the Deputy Prime Minister (2005). A Practical Guide to the Strategic Environmental Assessment Directive.
[2] UKWIR (2012) Strategic Environmental Assessment and Habitats Regulation Assessment – Guidance for Water Resources Management Plans & Drought Plans (12/WR/02/A).

Stage / Task	Purpose
Task B3. Predicting the effects of the plan or programme, including alternatives	To predict the significant environmental effects of the plan or programme and its alternatives.
Task B4. Evaluating the effects of the plan or programme, including alternatives	To evaluate the predicted effects of the plan or programme and its alternatives and assist in the refinement of the plan or programme.
Task B5. Mitigating adverse effects	To ensure that adverse effects are identified and potential mitigation measures are considered.
Task B6. Proposing measures to monitor the environmental effects of plan or programme implementation	To detail the means by which the environmental performance of the plan or programme can be assessed.
Stage C: Preparing the Environmental Report	
Task C1. Preparing the environmental report	To present the predicted environmental effects of the plan or programme, including alternatives, in a form suitable for public consultation and use by decision-makers.
Stage D: Consulting on the Draft Plan or programme and the Environmental Report	
Task D1. Consulting the public and consultation bodies on the draft plan or programme and the Environmental Report	To give the public and the consultation bodies an opportunity to express their opinions on the findings of the Environmental Report and to use it as a reference point in commenting on the plan or programme. To gather more information through the opinions and concerns of the public
Task D2. Assessing significant changes	To ensure that the environmental implications of any significant changes to the draft plan or programme at this stage are assessed and taken into account.
Task D3. Making decisions and providing information	To provide information on how the Environmental Report and consultees opinions were taken into account in deciding the final form of the plan or programme to be adopted.
Stage E: Monitoring the significant effects of the plan or programme on the environment	
Task E1. Developing aims and methods for monitoring	To track the environmental effects of the plan or programme to show whether they are as predicted; to help identify adverse effects.
Task E2. Responding to adverse effects	To prepare for appropriate responses where adverse effects are identified.

1.6 Structure of the Environmental Report

This SEA Environmental Report presents the findings of Tasks B1 to C1 set out in Table 1.3, and provides the public, stakeholders and regulatory bodies with an opportunity to express their opinions on the findings of the assessment. The Environmental Report is structured as follows:

- **Section 1** (this section): describes the requirement for, purpose and process of the SEA, and its context in relation to the draft Water Resources Management Plan.
- **Section 2** – Policy Context: identifies key messages and environmental protection objectives from other relevant plans and programmes.

- **Section 3** – Environmental Baseline Review: draws out the key environmental issues South Staffs Water intends to consider in the SEA.
- **Section 4** – Methodology: provides details of the methods employed in undertaking the assessment including the cumulative effects assessment methodology.
- **Section 5** – Describes the Environmental Screening of Water Resources Management Plan options undertaken that was undertaken and summaries the results.
- **Section 6** – Assessment of Water Resources Management Plan options: presents the potential effects of the various Water Resources Management Plan options against the SEA framework.
- **Section 7** – Presents the assessment of the preferred programme of options for the Final WRMP
- **Section 8** – Cumulative Effects Assessment: discusses the potential cumulative effects between options and other plans and projects in the region.
- **Section 9** – Describes how the SEA has been used to inform the development of the Final Water Resources Management Plan.
- **Section 10** – Mitigation and Monitoring: discusses measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the Final Water Resources Management Plan and monitoring to track the environmental effects to show whether they are as predicted, to help identify any adverse effects and trigger deployment of mitigation measures.
- **Section 11** – References the SEA quality assurance checklist.
- **Section 12** – Conclusions and Next Steps.

1.7 Consultation

1.7.1 Consultation on the Scoping Report

Consultation bodies, stakeholders and the public were invited to express their views on the Scoping Report in accordance with SEA Regulation 12(5). The Scoping Report was issued on 21st April 2017 to the Environment Agency (EA), Historic England and Natural England (NE), and was made available to the public and stakeholders on the South Staffs Water website. The consultation period ran until 2nd June 2017. The responses to comments provided on the Scoping Report and how these have been considered in carrying out the SEA are presented in Appendix A.

1.7.2 Consultation on the Environmental Report

This Environmental Report has been produced taking into consideration the responses received from consultation bodies during the Scoping consultation. It provides assessments of the potential effects (adverse and beneficial) of the water resources management options considered for the draft Water Resources Management Plan and sets out how the findings have been used to inform the development of the plan.

The public, regulatory bodies and stakeholders were invited to express their views on the draft Environmental Report, and South Staffs Water's draft 2019 Water Resources Management Plan that the Environmental Report accompanies, between 2nd March and 28th May 2018.

2 Policy Context

2.1 Introduction

Annex 1 of the SEA Directive (Directive 2001/42/EC) requires the following specific information to be included within the Environmental Report:

- *'an outline of the…relationship with other plans and programmes'*
- *'the relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme'*
- *'the environmental characteristics of areas likely to be significantly affected'*
- *'any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC (the 'Birds Directive') and 92/43/EEC (the 'Habitats Directive')'*
- *'the environmental protection objectives, established at international, (European) Community or Member state level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.'*

In accordance with the Directive, a review of relevant plans, policies and programmes is presented in Appendix B. A summary of key messages derived from the review is presented in Table 2.1 of this section.

2.2 Review of Policies, Plans and Programmes

Identifying other relevant plans, policies and programmes, as well as environmental protection and social objectives, is one of the first steps in undertaking SEA, forming part of Stage A of the SEA process. The review identifies how South Staffs Water's Final WRMP might be influenced by other plans, policies, programmes and other objectives which the WRMP should consider. This information helps to identify and inform the objectives for the SEA process.

Relevant plans, policies and programmes were identified from the wide range that has been produced at an international, national, regional and local level. The emphasis is on '*relevant*': plans and programmes that have no likely interaction with the WRMP (i.e. they are unlikely to influence the WRMP, or be influenced by it), have been excluded from the review. Important relevant plans, policies and programmes and strategic level plans that fall within the area under consideration have been considered, including relevant plans, policies and programmes in Wales as some key water sources used by South Staffs Water are located within Wales.

Net environmental gain has been included as a principle in the Government's 25 year Plan to Improve the Environment[3] published in January 2018. References to achieving net gains across the three overarching objectives for sustainable development (economic, social and environmental) along with achieving net gain in biodiversity are set out in the updated National Planning Policy Framework (NPPF) 2018[4]. References to achieving net gains across each of the three sustainable development dimensions (economic, social and environmental) as well providing net gains for biodiversity were previously referenced in the 2012 NPPF[5]. Having regard to the Government's 25 year Environment Plan and the updated NPPF it is considered that the SEA objectives established, consulted upon and adopted remain relevant.

[3] HM Government (2018). A Green Future: Our 25 year Plan to Improve the Environment
[4] Ministry of Housing, Communities and Local Government (2018). National Planning Policy Framework (NPPF) 2018
[5] Department for Communities and Local Government (2012). National Planning Policy Framework (NPPF) 2012.

The Government states that the ‘net environmental gain’ principle for development aims to deliver environmental improvements locally and nationally, primarily to "enable housing development without increasing overall burdens on developers". South Staffs Water in its Final WRMP19 further explains the benefits that are expected to arise as a result of implementing its plan and measures aimed at delivering overall net environmental gain.

The key messages derived from the review of policies, plans and programmes are documented below in Table 2.1. Appendix B provides a detailed summary of all the policies, plans and programmes identified through the review.

Table 2.1 Key Policy Messages derived from the Review of Policies, Plans and Programmes

SEA Topic	Key Messages
Biodiversity, flora and fauna	• Conservation and enhancement of the natural environment and of biodiversity, particularly internationally and nationally designated sites, whilst taking into account future climate change and ability to adapt. • Promote a catchment-wide approach to water use to ensure better protection of biodiversity. • To achieve favourable condition for priority habitats and species. • Avoidance of activities likely to cause irreversible damage to natural heritage. • Support well-functioning ecosystems, respect environmental limits and capacities, and maintain/enhance coherent ecological networks, including provision for fish passage and connectivity for migratory/mobile species. • Strengthen the connections between people and nature and realise the value of biodiversity. • Ensure maintenance and/or support provision of fish passage for migratory fish. • Protection, conservation and enhancement of natural capital. • Ecosystem services from natural capital contributes to the economy and therefore should be protected and, where possible, enhanced. • Avoidance of activities likely to cause the spread of Invasive Non-Native species (INNS). • A need to protect the green infrastructure network.
Population and human health	• To ensure secure, safe, reliable, dependable, sustainable and affordable supplies of water are provided for all communities and all business sectors. • Access to high quality open spaces and opportunities for sport and recreation can make an important contribution to the health and well-being of communities. • To provide a clean, healthy environment that benefits both people and the economy. • Water resources play an important role in supporting the health and recreational needs of local communities. • Increase awareness of sustainability, the true value of water and its efficient use. • Promotion of well-being and healthy communities and protection from risks to these. • Promotion of a sustainable economy supported by universal access to essential utility and infrastructure services. • Protection and improvement of drinking water quality.
Material assets and resource use	• Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently. • Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources. Government expects water companies to continue reducing overall demand for water. • Contribute to a resource efficient, green and competitive low carbon economy. • Maintain a resilient, reliable public water supply and ensure there is enough water for human uses, as well as providing an improved water environment.

SEA Topic	Key Messages
	• Minimise the production of waste, maximise resource benefits from waste and ensure waste management is in line with the 'waste hierarchy': eliminate waste sent to landfill. • Promote the sustainable management of natural resources.
Water	• Promote sustainable production and consumption whilst seeking to reduce the amount of waste generated by using materials, energy and water more efficiently. • Consider issues of water demand, water supply and water quality in the natural environment and ensure a sustainable use of water resources. Government expects water companies to continue reducing overall demand for water. • Contribute to a resource efficient, green and competitive low carbon economy. • Maintain a resilient, reliable public water supply and ensure there is enough water for human uses, as well as providing an improved water environment. • Minimise the production of waste, maximise resource benefits from waste and ensure waste management is in line with the 'waste hierarchy': eliminate waste sent to landfill. • Promote the sustainable management of natural resources. • Balance the abstraction of water for supply with the other functions and services the water environment performs or provides. • Steer new development to areas with the lowest probability of flooding and manage any residual flood risk, taking account of the impacts of climate change. • Promote measures to enable and sustain long-term improvement in water efficiency. • Ensure a sustainable balance between the supply and demand for water. • Reduce flood risk to people, residential and non-residential properties, community facilities and key transport links, as well as designated nature conservation sites and heritage assets and landscapes of value. • Reduce risk of flooding from reservoirs. • Support achievement of River Basin Management Plan objectives.
Soil, geology and land use	• Protect and enhance the quality and diversity of geology (including geological Sites of Special Scientific Interest) and soils including geomorphology and geomorphological processes. • Ensure that soils will be protected and managed to optimise the varied ecosystem service functions that soils perform for society (e.g. supporting agriculture and forestry, protecting cultural heritage, carbon sequestration, supporting biodiversity, as a platform for construction), in keeping with the principles of sustainable development. • Promote catchment-wide approach to land management by relevant stakeholders, in order to benefit natural resources, reduce pollution and develop resilience to climate change. • Promote mixed use developments, and encourage multiple benefits from the use of land in urban and rural areas, recognising that some open land can perform many functions. • Encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value. • Minimise coastal erosion. • Conservation and enhancement of geological SSSIs.
Air and climate	• Reduce greenhouse gas emissions. Targets include: reduce the UK's greenhouse gas emissions by at least 80% (relative to 1990 levels) by 2050. In Wales, target is to achieve an 80% reduction in emissions. • Reduce the effects of air pollution on ecosystems.

SEA Topic	Key Messages
	• Improve overall air quality. • Sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. • Minimise energy consumption, support the use of sustainable/renewable energy and improve resilience to climate change. • Build in adaption to climate change to future planning and consider the level of urgency of associated risks of climate change impacts accordingly. • Need for adaptive measures to respond to likely climate change impacts on water supply and demand.
Archaeology and cultural heritage	• Built development in the vicinity of historic buildings and Scheduled Monuments could have implications for the setting and/or built fabric and cause damage to any archaeological deposits present on the site. • Ensure active management of the Region's environmental and cultural assets. • Ensure effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets are avoided. Consider effects on important wetland areas with potential for paleo-environmental deposits. • Promote the conservation and enhancement of the historic environment, including the promotion of heritage and landscape as central to the culture of the region and conserve and enhance distinctive characteristics of landscape and settlements. • Conserve and enhance the historic environment, heritage assets and their settings. • 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.
Landscape and visual amenity	• Protection and enhancement of landscape (including designated landscapes, landscape character, distinctiveness and the countryside). • Take account of the different roles and character of different areas, promoting the vitality of main urban areas, protecting the Green Belts around them, recognising the intrinsic character and beauty of the countryside and supporting thriving rural communities within it. • Enhance the value of the countryside by protecting the natural environment for this and future generations. • Improve access to valued areas of landscape character in sustainable ways to enhance its enjoyment and value by visitors and stakeholders.

3 Environmental Baseline Review

3.1 Introduction

An essential part of the SEA process is to identify the current baseline environmental conditions and their likely evolution during the life of the plan (in this case, a maximum of 25 years). The SEA Directive (Directive 2001/42/EC) also requires that the evolution of baseline conditions of the plan area (that would take place with or without implementation of the plan) is identified. This is useful when determining impact significance, particularly with regards to baseline conditions that may already be improving or worsening and the rate of such change.

Full environmental baseline data and the likely evolution of the baseline conditions are presented in Appendix C and have been drawn from a variety of sources, including a number of the plans and programmes reviewed as part of the SEA process (as set out above in Table 2.1). This environmental baseline review also summarises the likely future trends for the environmental issues being considered (as far as information is available). The key issues arising from the review of baseline conditions are summarised in Section 3.3. The key issues for the evolution of the baseline conditions in the absence of the WRMP19 are summarised in Section 3.4. The best available projections for environmental and social characteristics have been considered and summarised, but there is significant uncertainty which increases with time.

These key issues are considered as part of the assessment process. In this way, the resilience of options, programmes and the overall plan can be assessed and used to inform decision-making as well as future recommendations for monitoring of the effects of the plan to provide data for subsequent WRMPs and associated SEAs.

With knowledge of existing conditions and how these may evolve in the absence of the Water Resources Management Plan, the potential effects (adverse and beneficial) of the Water Resources Management Plan can be identified, mitigated where necessary and subsequently monitored.

3.2 Limitations of the data and assumptions made

The principal limitations surround the future social and environmental baseline where there is substantial differences in the availability and temporal resolution of robust projections across the various SEA topic areas: for example, whilst climate change estimates extend to a similar horizon to the WRMP planning period, regional population and housing forecasts rarely go beyond a 20 year horizon and forecasts of how the natural environment may change are very limited.

The study area for the SEA (greater in extent than just the supply area) is relatively large and covers a number of different geographical and political regions, which makes establishing a baseline at the sub-regional level challenging. There are also challenges around extrapolating information from data collated at differing spatial resolutions. Spatial data have been obtained for most of the SEA topics, and the baseline is presented graphically as mapped information where appropriate. In some instances, reporting cycles mean that available information is dated.

SEA is a high-level assessment aimed at highlighting potential environmental concerns. The environmental data to be used in this assessment is based on that which is readily available from existing sources, e.g. statutory organisations. No primary research or survey work has been carried out specifically to inform the SEA and therefore it is possible that at the individual option level, there may be additional environmental issues that could have an influence on a WRMP option.

3.3 Key issues

The baseline was set out in the Scoping Report and has been updated based on feedback provided through consultation. The baseline is detailed further in Appendix C. Key issues arising from the review of baseline conditions for each of the SEA topics are summarised in Table 3.1. These key issues have been used to support the development of the SEA objectives in Section 4.

Table 3.1 Summary of key sustainability issues

SEA topic	Key messages
Biodiversity, flora and fauna	• The need to protect or enhance the region's biodiversity, particularly protected sites designated for nature conservation. • The need to avoid activities likely to cause irreversible damage to natural heritage. • The need to take opportunities to improve connectivity between fragmented habitats to create functioning habitat corridors • The need to recognise the importance of allowing wildlife to adapt to climate change. • The need to control the spread of Invasive Non-Native Species (INNS) • The need to engage more people in biodiversity issues so that they personally value biodiversity and know what they can do to help, including through recognising the value of ecosystem services.
Population and human health	• The need to ensure water supplies remain affordable especially for deprived or vulnerable communities, reflecting the importance of water and sewerage services for health and wellbeing. • The need to ensure continued improvements in levels of health across the region, particularly in urban areas and deprived areas. • The need to ensure continuing safe, reliable and resilient provision of water and sewerage services to maintain health and wellbeing of the population. • The need to ensure a balance between different aspects of the built and natural environment that will help to provide opportunities for local residents and tourists, including opportunities for access to, protecting and enhancing recreation resources, green infrastructure and the natural and historic environment. • The need to accommodate an increasing population. • Sites of nature conservation importance, heritage assets, water resources, important landscapes and public rights of way contribute to recreation and tourism opportunities and subsequently health and well-being and the economy.
Material assets and resource use	• The need to minimise the consumption of resources, including water and energy. • The need to reduce the total amount of waste produced in the region, from all sources. The need to recognise waste as a potential resource and reuse waste productively where possible to support development of the circular economy. • The need to reduce the proportion of waste sent to landfill. • The need to continue to actively control leakage from the water supply system and promote the efficient use of water to help reduce future demand for water.

SEA topic	Key messages
Water	• The need to further improve the quality of the regions' river and estuarine waters taking into account WFD objectives. • The need to maintain the quantity and quality of groundwater resources taking into account WFD objectives. • The need to improve the resilience, flexibility and sustainability of water resources in the region, particularly in light of potential climate change impacts on surface water and groundwater. • The need to ensure sustainable abstraction to protect the water environment and meet society's needs for a resilient water supply. • The need to reduce and manage flood risk. • The need to ensure that people understand the value of water**.**
Soil, geology and land use	• The need to protect geological features of importance (including geological SSSIs) and maintain and enhance soil function and health. • The need to manage the land more holistically at the catchment level, benefitting landowners, other stakeholders, the environment and sustainability of natural resources (including water resources). • The need to make use of previously developed land (brownfield land) and to reduce the prevalence of derelict land in the region.
Air and climate	• The need to reduce air pollutant emissions (industrial processes/transport) and limit air emissions to comply with air quality standards. • The need to reduce greenhouse gas emissions (industrial processes and transport). • The need to mitigate against climate change through the reduction in greenhouse gas emissions in order to contribute to risk reduction over the long term. • The need to adapt to the impacts of climate change for example through, sustainable water resource management, water use efficiencies, specific aspects of natural ecosystems (e.g. connectivity), as well as accommodating potential opportunities afforded by climate change.
Archaeology and cultural heritage	• The need to conserve or enhance sites of archaeological importance, heritage assets and cultural heritage interest, and their settings, particularly those which are sensitive to the water environment.
Landscape and visual amenity	• The need to protect and improve the natural beauty of the region's AONBs, National Parks and other areas of natural beauty. • The need to protect and improve the character of landscapes and townscapes.

3.4 Future Environmental Baseline

3.4.1 Biodiversity, Flora and Fauna

Policy and management plans are expected to continue to focus on improving the condition of locally, nationally or internationally designated sites and NERC habitats, in contribution to meeting their respective conservation objectives over the next 25 years. These management plans recognise the importance of local environment initiatives and community activities, which are anticipated to increase the number of locally designated sites. The importance of partnership working to achieve reduced net loss of priority habitats and enhancing people's personal connection with wildlife and nature, is emphasised in the Natural Environment White Paper and 'Biodiversity 2020' governmental policies. The Natural Environment White Paper identifies the Government's aims to work to achieve more, bigger, better and less-fragmented areas for wildlife, including targets for no net loss of priority habitat and an increase of at least 200,000 hectares in the overall extent of priority habitats and at least 50% of SSSIs to be in favourable condition, while maintaining at least 95% in favourable or recovering condition. 'Biodiversity 2020' builds on the Natural Environment White Paper, the mission of which is 'to halt overall biodiversity loss, support healthy well-functioning ecosystems and establish coherent ecological networks, with more and better places for nature for the benefit of wildlife and people'.

3.4.2 Population and Human Health

The Water White Paper described modelling undertaken under a range of scenarios which suggests that by 2030, water bills may increase by an average of 14%. However, continuing reforms to the water industry are anticipated to increase competition and innovation in the water industry market, and drive cost-effective responses to water resources challenges, thereby limiting the impact on customer bills. For example, South Staffs Water has already developed the Assure Tariff as a tool to help people on lower incomes who want to be good payers but have fallen into debt.

3.4.3 Material Assets and Resource Use

There is the potential for an increase in water usage as regional population increases. Consequently, the Government, Ofwat and the Environment Agency are expected to enforce water companies to set leakage targets that take account of customer priorities for reliable water supplies, in addition to increased standards of treatment through regulatory requirements. These aims are echoed in the Government's National Infrastructure Plan (NIP) (2010) and recent (2018) National Infrastructure Commission Report, which include visions to treat water and waste in ways that sustain the environment and ensure a supply of water that meets the needs of households, businesses.

3.4.4 Water

The Environment Agency Water Strategy Regional Action Plan for Midlands Region used future scenarios to look at future pressures on water resources, although population growth is expected to increase at a modest average of 14%. Under the worst-case scenario, a further 1,025 Ml/d may potentially be necessary in the Severn (England) and Humber (south) River Basins by 2050 to meet the additional needs of the public, industry and agriculture.

By 2050, climate change could reduce river flow by 10% to 15% on an annual average basis, and could reduce summer river flows by 50% to 80%. The Water Strategy Regional Action Plan for Midlands Region and UK Climate Change Risk Assessment (CCRA) 2016 Evidence Report list key priorities for the Midland region and in response to the impacts of climate change up until 2100. For example, all abstractions in Midlands Region to be sustainable, because of corresponding pressure on the UK's water resources due to changes in hydrological conditions, population growth and regulatory requirements to maintain good ecological status.

3.4.5 Soil, Geology and Land-use

The vision of Defra's Soils Strategy for England[6] is for all England's soils to be managed sustainably and degradation threats tackled successfully by 2030. To this end, South Staffs Water has developed

[6] Defra (2009) Safeguarding our soils – A Strategy for England

the SPRING Environmental Protection Scheme which aims to support local arable farmers in the Blithe catchment area willing to explore catchment friendly alternatives, to improve agricultural management practices, with benefits to water quality and reduced pollution. The catchment-based approach to water quality and diffuse pollution is supported by the Government's Water White Paper and the subsequent Defra strategic policy.

3.4.6 Air and Climate

Analysis of climate change risks by the CCRA several key challenges facing the water industry, including; public water demand-supply deficit, lower summer river flows, number of unsustainable water abstractions (total), the northward spread of invasive non-native species, increased soil erosion due to heavy rainfall and an increase in water demand for irrigation of crops. It is considered likely that Government policy will continue to evolve to further improve air quality in light of continued concern as to the health impacts of air pollution in the Midlands and wider UK.

3.4.7 Archaeology and Cultural Heritage

The NPPF aims to protect heritage assets from future development and highlight the importance of the conservation of heritage assets to enable their enjoyment by future generations. Climate change could have variable impacts on heritage assets in the future, particularly those which are sensitive to the water environment. The current focus and protection of heritage assets is considered unlikely to materially change over the next 25 years, as set out in the 2018 NPPF.

3.4.8 Landscape and Visual Amenity

One of the core planning principles reaffirmed in the 2018 NPPF is to take account of the different roles and character of areas, promoting the vitality of our main urban areas recognising the intrinsic character and beauty of the countryside. Of these, a great weight is placed on conserving landscape and scenic beauty in AONBs. Consequently, the impact of climate change towards landscape character is recognised as an increasingly pressing issue for development as well as the need to protect landscape and visual amenity in the face of housing growth projections for the Midlands.

4 Assessment Methodology

4.1 Environmental Assessment Approach for WRMP

The SEA has been undertaken in parallel with the Habitats Regulations Assessment (HRA) and Water Framework Directive (WFD) assessment to ensure an integrated approach to environmental assessment, and has been used to inform the development of the Final WRMP19 to ensure its overall compliance with relevant legislation. Figures 4.1 and 4.2 show the overall process for integrating SEA into the development of the Final WRMP19.

Figure 4.1 Integrating SEA into WRMP decision-making alongside HRA and WFD assessments

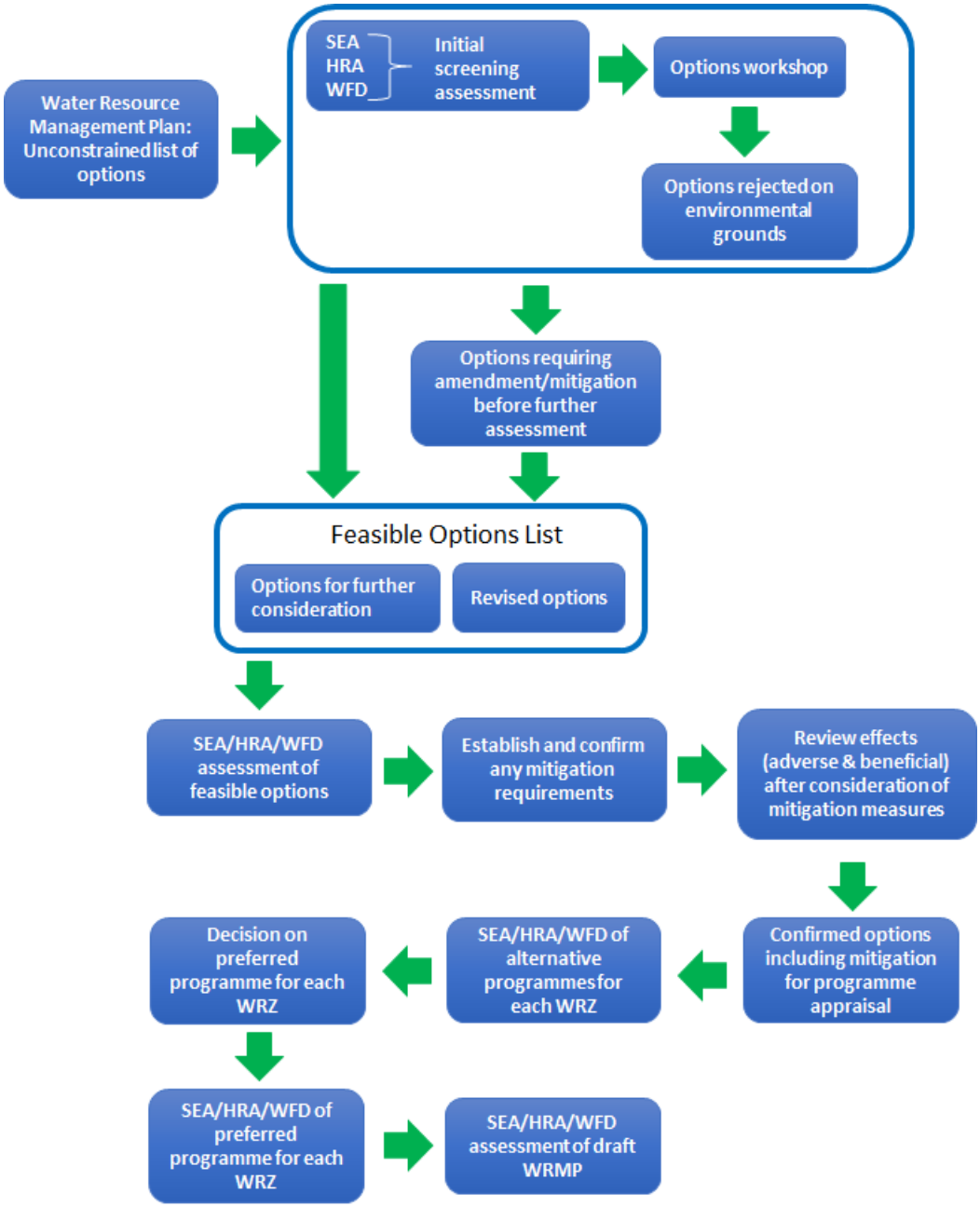


Figure 4.2 Integrating SEA into the WRMP development alongside HRA and WFD assessments

As described in Figures 4.1 and 4.2, a staged assessment approach has been followed in developing the Final WRMP19. Initially, a high-level SEA (and HRA and WFD) review was applied to an 'unconstrained' list of options, this also considered statuary/regulatory/legal constraints. This then helped inform the development of a Constrained/Feasible list of options by screening out options where SEA (HRA or WFD) assessment identified significant environmental effects that mitigation was unlikely to be able to address to reduce the effects to an acceptable level. The constrained/feasible list of options was then subject to detailed assessment in accordance with the methodology described in this Section.

4.2 SEA Methodology

This section outlines the methodology that has been used to undertake the SEA of the Water Resources management options in the South Staffs Water's Final Water Resources Management Plan, taking account of the relevant key parts of the SEA Regulations:

Regulation 12:

(2) "The report shall identify, describe and evaluate the likely significant effects on the environment of –

(a) implementing the plan or programme; and

(b) reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme".

Schedule 2:

"The Environmental Report should include:

(6) The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects and secondary, cumulative and synergistic effects.

(8) An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information".

4.2.1 Assessment Methodology and SEA Framework

The environmental and social assessment of the alternative Water Resources Management Plan options adopts an 'objectives-led' approach. Establishing assessment objectives is a recognised way of considering the environmental effects of a plan and comparing the effects of alternatives. The SEA objectives are derived from environmental and social objectives established in law, policy or other plans and programmes, as well as from the review of baseline information and environmental problems associated with the SEA topics.

An assessment framework of objectives has been developed based on:

- The key policy messages and environmental and social protection objectives identified in the review of policies, and other plans and programmes (see Section 2). This helps to highlight any area where the Water Resources Management Plan will support or hinder the achievement of the objectives of policies, other plans and programmes.
- The current state of the environment in the area under consideration, its likely future evolution and the key environmental issues identified (see Section 3).

The SEA objectives and key indicator questions are set out in Table 4.1 and take account of the comments received on the draft SEA objectives presented in the SEA Scoping Report (see Appendix A). The following amendments have been made:

The key indicator questions that support the SEA objectives relating to biodiversity, flora and fauna have been amended to reflect consideration for creating habitats and protecting species.

A new objective (1.4) has been added to account for the risk of spreading/introducing invasive non-native species.

Objective 7.2, concerning archaeology and cultural heritage, has been merged with objective 7.1 as they overlap.

The following sections describe how these SEA objectives have been used in the assessment of the environmental and social effects of the potential Water Resources Management Plan options. By assessing each option against these objectives, the effects of the different water resources management options can be objectively compared and the findings used to help determine the options to be included in the Water Resources Management Plan, their timing and phasing of implementation.

The assessment of each option included consideration of the following information:

- Details of each potential water resources management option;
- Likelihood and predicted frequency of deployment of the option;
- Construction (where applicable) and operational/implementation details;
- Benefits to the water supply-demand position in a drought (taking uncertainty into account); and
- Key elements of the baseline environment, such as location of designated sites, priority habitats and species, landscape areas or heritage assets, recreational facilities and other environmental features.

Table 4.1 SEA objectives and indicator questions

SEA topic	SEA objective	Key indicator questions
Biodiversity, fauna and flora	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). 1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy. 1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services. 1.4 To avoid introducing or spreading INNS.	• 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 introduce or allow the spread of Invasive Non-Native Species (INNS)? • Will it avoid the spread of non-native invasive species? • 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? • Will it protect or enhance natural capital and ecosystem services? • Will it maintain or enhance access to areas of natural heritage conservation interest? • Will it provide educational or information resources for the public? • Will it create areas of improved biodiversity in urban or deprived areas? • Does it take account of climate change adaptation? • Will it introduce or allow the spread of Invasive Non-Native Species (INNS)?
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). 2.2 To protect and enhance the water environment for other users including recreation and navigation, as well as terrestrial recreational resources (including National Trails and Public Rights of Way) 2.3 To promote a sustainable economy	• Will it help to ensure provision of access to a secure resilient and affordable supply of drinking water particularly where additional water resources may not be available? • 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 protect or enhance opportunities for recreation and tourist activities such as public rights of way and including navigation?

SEA topic	SEA objective	Key indicator questions
	with good access to essential services, including a resilient, high quality and affordable supply of water over the long term.	• Will it help to promote healthy communities and avoid risks to health and wellbeing (for example through nuisance or resulting from traffic or transport changes, disruption to safe and reliable water/sewerage services)? • Will it assist in ensuring provision of essential infrastructure and services to support health and well-being a sustainable economy? • Is it located in an area considered to be significantly more deprived than others in the region? • Will it improve access to open spaces, the natural and historic environment? Does it protect and enhance the green infrastructure network?
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. 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 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 enable efficient water resource management to help maintain a supply-demand balance? • Will it encourage the productive reuse of waste including energy recovery?
Water	4.1 To avoid adverse impact on surface and groundwater levels and flows, including when this impacts on habitats and/or navigation. 4.2 To protect and enhance surface and groundwater quality and protect and enhance estuarine waterbodies. 4.3 To ensure appropriate and sustainable water resource management	• Will it alter the flow regime or residence time of surface waters? • Will it prevent water pollution? • Will it affect water quality compliance or WFD protected areas? • Will it lead to changes in river flows, wetted width or river level? • Will it lead to changes in groundwater levels and recharge? • Will it present a risk to water quality of groundwater, surface waters or estuarine waters? • Will it prevent water pollution?

SEA topic	SEA objective	Key indicator questions
	whilst protecting ecosystem functions that rely on water resources, including contributing to the achievement of WFD objectives 4.4 To promote measures to enable and sustain long term improvement in water efficiency. 4.5 To reduce or manage flood risk.	• Will it affect water quality compliance? • Will it affect WFD protected areas? • Will it achieve WFD compliance? e.g. good ecological potential/status, prevent deterioration of WFD status between status classes? • 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 present a risk to water quality of groundwater or surface waters? • Will it ensure sustainable abstractions, taking account of water resources availability status? • Will it contribute to meeting society's needs for a sustainable, resilient water supply? • Will it achieve an appropriate balance of water supply with other functions and services? • Will it contribute towards improving the awareness of water sustainability and its true value? • Will it promote measures to enable improvements in water efficiency and assist in balancing supply and demand? • Will it avoid reducing flood plain storage, or provide opportunities to improve flood risk management?'
Soil, geology and land use	5.1 To protect and enhance geology, geomorphology, the quality and quantity of soils 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 avoid damage to and protect geologically important sites? • Will it protect and enhance geomorphology and geomorphological processes? • Will it protect and enhance the quality of soils? • 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? • Will it protect and enhance geological SSSIs or similar nationally protected sites?

SEA topic	SEA objective	Key indicator questions
	5.3 To promote a catchment-wide approach to catchment land management.	
Air and Climate	6.1 To reduce air pollutant emissions. 6.2 To reduce greenhouse gas emissions. 6.3 To adapt and improve resilience to the threats of climate change.	• Will it reduce or minimise air pollutant and greenhouse gas 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)? • Will it reduce transport or energy requirements? • 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 resilience of water supplies? • Will it create opportunities to benefit from potential effects of climate change? • Will it make use of renewable energy?
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?
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?

4.3 Assessment Framework

4.3.1 SEA Screening of Options

At the outset of developing the alternative options to be considered for the WRMP, SEA principles were used to carry out a high-level screening assessment of the options in the 'unconstrained' list. This included consideration of several key environmental and social criteria including risk to Water Framework Directive (WFD) water body status and risk of likely significant effects on European designated conservation sites under the Habitats Regulations. This screening helped identify several options that would likely lead to unacceptable adverse effects on the environment or society; these options were therefore excluded from the 'unconstrained'.

The findings from the screening process were shared and discussed with the EA and NE (7/11/2016 and 22/05/2017). Feedback from this engagement, along with the findings of the screening assessment and ongoing option development and environmental assessment (described below) resulted in several further options being excluded to form the feasible list.

4.3.2 Primary Assessment of Options

The appraisal framework set out in Table 4.2 below has been used to assess each of the potential WRMP options, taken forward to the constrained/feasible list, against the SEA objectives. The outcomes of the assessment have been used to inform the development of the Water Resources Management Plan, primarily the selection and phasing of options for inclusion in South Staffs Water's Water Resources Management Plan.

The first and second columns set out the SEA topics and objectives. The third column provides commentary and evaluation of the impact of each alternative measure on the objectives for each topic, with reference to the key questions set out above in Table 4.1. The assessment assumes the implementation of standard industry best practice methods in implementing the options as well as any defined mitigation measures (which are set out in the commentary) such that the significance of effects relates to the residual effects after the application of any mitigation measures in line with the ODPM Practical Guide and UKWIR SEA national guidance. The eighth column identifies the magnitude of the effect assessed against a scale of negligible to high. The effect magnitude includes consideration of the scale of the impact, likelihood, duration and permanence (fourth, fifth, sixth and seventh columns of Table 4.2) in compliance with criteria for determining the likely significance of effects specified in the SEA Directive Article 3(5) and Annex II, and the SEA Regulations Part 2, Regulation 9(2a) and Schedule 1. The value and sensitivity of the receptor(s) is identified in the ninth column on a scale of negligible to high. The scale of the effect, which might relate to either geographical scale or the size of the population affected, is identified in the sixth column on a scale of negligible to large. With respect to duration, short-term effects are defined as those that last for up to six months, medium term effects are those that extend beyond six months to two years whilst long term effects are assessed as those that continue for greater than two years.

The residual adverse and beneficial effects (after application of best practice approaches and any appropriate and explicitly defined mitigation measures) are identified in the tenth and eleventh columns respectively. These are identified separately so as to avoid mixing adverse and beneficial effects, in line with SEA best practice, so that these are clearly understood and the transparency of the effects is maintained throughout the Water Resources Management Plan decision-making process.

Where qualitative and/or quantitative information was available (e.g. as identified by the HRA or WFD assessment process), this has been used to inform the assessment. Objectives or key questions that are not supported by available data or information have been evaluated using spatial analysis, professional judgement and applicable assessment guidelines relating to that topic/objective.

Varying levels of uncertainty are inherent within the assessment process. The level of uncertainty of the option assessment for each SEA objective is included in the appraisal framework. Where there is significant uncertainty which precludes an effects assessment category being assigned for a particular SEA objective, an "uncertain" residual effects assessment label is applied to that specific SEA objective.

Table 4.2 Example SEA appraisal matrix

SEA topics and objectives		Assessment of option								
Topic	SEA objective	Potential residual effect on sensitive receptors: Commentary	Scale of effect: geographical / population affected (low / medium / high)	Certainty of effect (low / medium / high)	Duration of effect (short-term / medium-term, long-term)	Permanence of effect (permanent / temporary)	Magnitude of effect (low/ medium/ high)	Value/ sensitivity of receptor (low / medium / high)	Residual adverse effect significance (negligible / minor / moderate / major)	Residual beneficial effect significance (negligible / minor / moderate / major)
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).									
	1.2 To protect, conserve and enhance natural capital and the ecosystem services from natural capital that contribute to the economy.									
	1.3 To strengthen the connections between people and nature and realise the value of biodiversity and ecosystem services.									

The SEA appraisal framework has been used to capture the assessment for each option (one table completed per option) and the WRMP as a whole.

The assessment of the options and the overall WRMP has been carried out using the effects assessment matrix shown in Figure 4.3 taking account of the scale, duration and permanence of the effect. The definitions for the effect significance are explained beneath Figure 4.3. The colour coding shown in Figure 4.3 will be used to complete the columns for residual effects in the SEA appraisal framework.

The effects assessment takes account of any proposed mitigation measures that have been incorporated into the option conceptual design and costs, i.e. it is the residual effects after the application of mitigation that will be assessed. Certain mitigation measures and construction practice were assumed standard for all options, for example:

- Best practice mitigation measures;
- Resources for construction of the scheme would be sourced locally where possible;
- Appropriate pipeline laying techniques regarding river crossings etc.;
- Footpath diversions established regarding construction work including pipelines; and
- Siting of temporary and permanent works to minimise impacts on setting of heritage and landscape features.

For each SEA objective, a residual effects assessment was determined against a significance of effects matrix (Figure 4.3) which considers the value/sensitivity of the receptor (e.g. species, air quality, river water quality, landscape value, heritage feature) and the magnitude of the assessed effect. This significance matrix comprises effects on a scale ranging from 'major beneficial' to 'major adverse'. For the box signifying low magnitude and high receptor value/sensitivity, this could result in a greater than 'moderate' effects being assigned dependent on the sensitivity/value of the receptor. This colour coding was used to complete the columns for residual effects in the appraisal framework.

The resulting significance of effects has been used in helping South Staffs Water to select the options for inclusion in the Water Resources Management Plan and the subsequent timing and phasing of the selected options. Where major adverse effects are predicted, measures envisaged to prevent, reduce (and as far as possible, offset) these effects on the environment (as a result of implementing the measure) are outlined where relevant/appropriate.

Figure 4.3 SEA significance matrix

Significance of effect		Value/sensitivity of receptor		
		High	Medium	Low
Effect magnitude	High	Major Beneficial / Major Adverse	Major Beneficial / Major Adverse	Moderate Beneficial / Moderate Adverse
	Medium	Major Beneficial / Major Adverse	Moderate Beneficial / Moderate Adverse	Minor Beneficial / Minor Adverse
	Low	Moderate Beneficial / Moderate Adverse	Minor Beneficial / Minor Adverse	Negligible

Significance levels identified in Figure 4.3 are defined as follows:

Major - effects represent key factors in the decision-making process. They are generally associated with sites and features of international, national or regional importance. If adverse, such resources/features are generally those which cannot be replaced or relocated.

Moderate - effects are likely to be important considerations at a regional or district scale. If adverse, they are likely to be of potential concern.

Minor - effects are not likely to be decision-making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.

Negligible - effects which are not perceptible, being within normal bounds of variation or the margin of forecasting error.

For the 'high' effect magnitude (top row), a major effect significance is assigned for both high and medium value receptors to reflect the magnitude of the effect.

For the 'low' effect magnitude and 'high' value receptor (bottom left box), the significance of effect could be minor, moderate or major dependent on the precise nature of the impact or benefit.

All options (both supply-side options and demand management options) are assessed to the same level of detail, in line with the SEA legislative requirements, national SEA guidance and the UKWIR SEA guidance. The level of detail is consistent with the strategic nature of SEA.

4.3.3 Summarising the effects assessment

The outputs derived from the completed appraisal framework tables for each Water Resources Management Plan option are presented in Section 6. The outputs are presented in a summary visual evaluation matrix, an example is provided below in Figure 4.4).

Figure 4.4 Example Visual Evaluation Matrix

Scheme		SEA Topics and Objectives																								HRA Screening	WFD Assessment	Commentary
		Biodiversity				Population and Human Health			Material Assets and Resource Use		Water					Soil, Geology and Land Use			Air and Climate			Archaeology and Cultural	Landscape and Visual				
		1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1					
Scheme 1	Adverse																									No LSE	Uncertain	
	Beneficial																											
Scheme 2	Adverse																									HRA Stage 2 Required	Negligible Risk	
	Beneficial																											
Scheme 3	Adverse																									No LSE	Uncertain	
	Beneficial																											

4.3.4 Secondary, cumulative and synergistic environmental effects

Schedule 2(6) of the SEA Regulations requires the assessment of "*The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects...*" These can be defined as follows:

- Secondary or indirect effects are effects that are not a direct result of the plan, (e.g. an abstraction that changes local groundwater levels and thus affects the ecology of a nearby wetland).
- Cumulative effects arise, for instance, where several nearby groundwater sources each have insignificant effects but together have a measurable effect on river flows; or where several individual effects of a water resource zone programme (e.g. traffic disruption) have a combined effect.
- Synergistic effects interact to produce a total effect greater than the sum of the individual effects. Synergistic effects often happen as habitats, resources or human communities get close to capacity. For instance, a wildlife habitat can become progressively fragmented with

limited effects on a particular species until the last fragmentation makes the areas too small to support the species at all.

The term 'cumulative effects' is being adopted as the collective term to include secondary, cumulative and synergistic effects (as suggested by the Practical Guide).

4.3.4.1 Option level cumulative effects assessment

A matrix has been used to help consider interactions between all the options in the feasible list that could potentially be implemented at the same time. Mutually exclusive options (e.g. those that draw upon the same resource or use the same site) were also identified. In assessing these effects, consideration has been given to other factors which may affect the receiving environment during implementation of the options.

4.3.4.2 Programme and WRMP level cumulative effects assessment

To meet the requirements of the SEA Directive, cumulative effects have been assessed within the preferred programmes, and between the WRMP and other relevant plans, programmes or projects. These include South Staffs Water's Drought Plan and neighbouring water companies' WRMPs and Drought Plans.

Cumulative effects with non-water resources related plans, programmes and projects have been considered where relevant, including existing completed projects, approved but uncompleted projects, ongoing activities, plans or projects for which an application has been made and which are under consideration by consenting authorities and plans and projects which are reasonably foreseeable (i.e. projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative effects).

Sources of information for the cumulative effects assessment include the following:

- Land use and development plans to identify major development proposals (those which are likely to generate large scale construction or operational effects e.g. growth points, strategic centres.
- Transport and other infrastructure plans (e.g. flood risk management plans, energy, and other utilities).

4.3.5 Consideration of reasonable alternatives

A wide range of alternative options were considered for the WRMP through the SEA process, including different supply-side and demand-side options. In determining the preferred programme of options, South Staffs Water has used the findings of the option-level SEA assessments (incorporating the HRA and WFD screening assessments) to inform the programme appraisal modelling, which has identified a short-list of alternative programmes. These alternatives have been assessed through the programme-level SEA to inform decisions on the preferred programme. Finally, the combined set of all feasible options included in the preferred programme has been assessed through the WRMP-level SEA, and including identification of any further modifications to the programmes prior to finalisation of the WRMP for public consultation.

4.4 Limitations of the study

SEA is a high-level assessment aimed at highlighting potential environmental concerns. The environmental data used in this assessment are based on that which is readily available from existing sources. Difficulties encountered in undertaking this SEA included the requirement to rely on varying levels of detail in design specifications of options, many of which are at conceptual or outline design stage only. Assessment of impacts is necessarily limited when, for example, pipeline routes are at an indicative stage only.

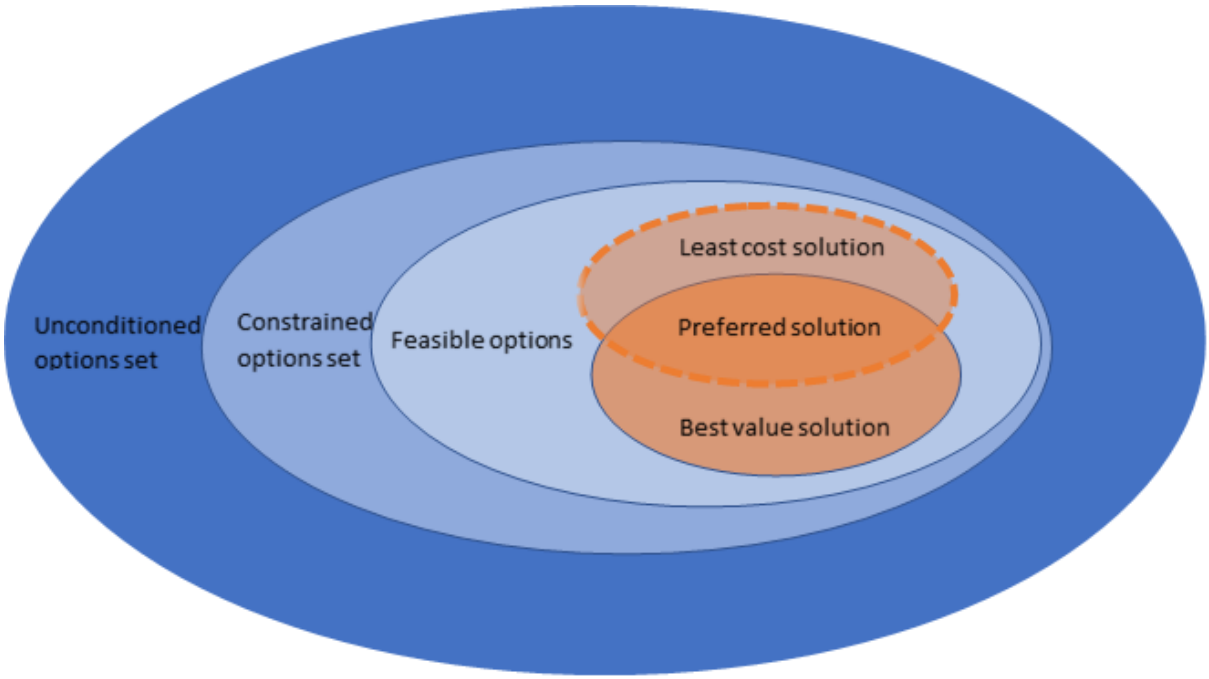
Where particular limitations or outstanding issues are known, these are briefly described in the SEA appraisal tables for the relevant option concerned. Detailed assessments of options will be conducted in project-level EIA closer to the time of option implementation.

5 Screening of options

5.1 Overview

Options appraisal is an overarching term for the specification and assessment of options under consideration for the WRMP. The UKWIR Guidance on integrating SEA into WRMPs and the WRPG provide clear directions as to how SEA outputs should be used in options and programme appraisal. This section describes the results of this process. Figure 5.1 summarises the overall approach to the evolution of the WRMP from initial 'unconstrained' list of options through to the preferred programme (as described in Section 4.3.1).

Figure 5.1 WRMP Options and Programme Appraisal



The 'unconstrained' list of options is a high-level list including generic option types as well as taking account of government policy and aspirations. It is populated with previous options and studies from past WRMPs as well as new option ideas. The draft 'unconstrained' list was consulted with the EA and NE (07/11/2016).

5.2 Moving from the Unconstrained Option set to the Constrained List

As described in Section 4.3.1, high level screening assessment of the options in the 'unconstrained' list which included consideration of several key environmental and social criteria (planning and environmental, HRA and WFD compliance risks) as well as other criteria under the headings 'Location of option benefits', 'Meet customer / stakeholder needs' and 'Option Robustness'. This identified options with unacceptable adverse environmental effects which were rejected from the options "pool" (initially formed of 108 supply options) and not taken further in the option appraisal process. This included groundwater options and an option relating to Chasewater Reservoir with identified environmental risks/concerns. Many options were rejected with respect to other key screening criteria, especially location and viability. Through this process a 'constrained' list of options was developed (23 options).

The findings from the screening process were shared and discussed with the EA and NE, along with key stakeholders.

5.3 Moving from the Constrained List to the Feasible list

A further, more detailed review of environmental and social assessment was applied to the 'constrained' list. The intent of the screening was to reject options that perform poorly on environmental grounds. The assessment criteria contributed evidence as to why any options have been screened as per WRMP Guidance "it should not include options with unalterable constraints that make them unsuitable for promotion (e.g. unacceptable environmental impacts that cannot be overcome). Again, options found to have unacceptable adverse environmental effects were rejected. For example, an excluded option (1.1.2) to drill new boreholes in Stour Valley (Upgrade Prestwood) has been screened out on the basis that it will have issues with Checkhill Bogs SSSI and Smestow Brook and potential major adverse construction-related impacts on the River Stour. Furthermore, there may be potential major adverse impacts on Fens Pools SAC which was identified within the proximity to the option in the HRA. The list was reduced to form the 'feasible list' (21 options) identified to be taken forward into the decision-making modelling processes. All these options have been fully assessed against the SEA objectives as described in Section 6.

6 Assessment of Options

6.1 Assessment of Options Against SEA Objectives

Assessment of the water resources management options has been carried out in accordance with the methodology described in Section 4. Appraisal framework assessment tables have been completed for each water resource option on the feasible list and are presented in full in Appendix E. A summary of the assessment is presented in this section as colour-coded visual evaluation summary matrices (Figures 6.1 and 6.2). The colour coding represents a range from significant adverse impact in red through to significant beneficial impacts in dark green as shown in the legend below.

Legend:

Colour		Significance of Effect
	Dark Green	Major Beneficial
	Mid Green	Moderate Beneficial
	Light Green	Minor Beneficial
	Blue	Negligible
	Yellow	Minor Adverse
	Orange	Moderate Adverse
	Red	Major Adverse

6.1.1 Demand Management Option Assessment Findings

A visual summary of the SEA conclusions for each of the demand side measures considered for South Staffs Water's Final Water Resources Management Plan is provided in Figure 6.1 below. The Demand Management options comprise measures to reduce leakage (e.g. Active Leakage Control and Pressure Management) and water efficiency measures (e.g. metering, changings to tariff structures, and promotion of water efficient devices). Overall, demand management options serve to reduce pressure on water resources by reducing customer demand for water and thereby helping to reduce the volumes of water abstracted from the water environment. This, in turn, also contributes to reducing the amount of energy needed for water abstraction, treatment and distribution. The options all have limited and temporary effects associated with vehicle movements during their commissioning phases. They may also cause disruption as a result of streetworks or nuisance, for example as a result of meter installations.

6.1.2 Supply Option Assessment Findings

Each of the supply options on the Feasible List of options (see Table 1.2) considered for South Staffs Water's Water Resources Management Plan has been assessed against the SEA objectives. The completed appraisal tables for each of the options are provided in Appendix E and should be referred to for full details of potential adverse and beneficial effects of each feasible option. The findings of the WFD assessments and the HRA have also been incorporated into the SEA assessment. A visual summary of the SEA conclusions and associated commentary is provided in Figure 6.2.

The assessment shows that of the numerous groundwater options, many may influence local groundwater levels and connected surface waterbodies with potential risk to some water-dependent habitats (options 1.1.1 to 1.4.5). Potential effects on water levels and/or surface water flows could affect other receptors reliant on certain thresholds of water level or flow. However, groundwater abstraction related options often have relatively small-scale surface infrastructure and have relatively limited potential for other types of adverse effects, apart from those associated with materials use and energy linked to the abstraction and treatment of water.

Two options involve surface water abstraction and transfer (option 2.1.1 and 7.1.2) which have the potential for a number of different adverse effects relative to the anticipated deployable output and associated beneficial effects. These include moderate adverse effects associated with construction impacts to designated sites and issues concerning the transfer of water between different catchments and the risk of spreading invasive non-native species.

Where significant major adverse effects have been identified they are, in the main, associated with reservoir options. These range from adapting existing reservoirs (e.g. Blithfield Reservoir, options 2.2.1 and 2.2.2) to the construction of storage reservoirs (e.g. options 6.1.1 and 6.1.3). The reservoirs could provide significant water storage and supply with low risks to the water environment in operation and therefore provide some benefits regarding resilience to the effects of climate change by storing water when river flows are high for use during periods of dry weather when groundwater and river sources may not be available or provide a reduced supply of water. However, they also have potential for significant adverse effects relating to construction and risks of the potential for permanent adverse effects on landscape, local communities and heritage features.

Three variants of an option (options 7.3.1, 7.3.2 and 7.3.3) that involves the purchase of the Shropshire Groundwater Scheme licence from the EA have relatively limited adverse effects relative to the benefits associated with the potential deployable output. The adverse effects are associated with construction and materials use and energy linked to the abstraction and treatment of water.

One option to import water from other water companies (option 7.5.1) have limited potential for adverse effects (other than energy linked to the abstraction and treatment of water) and moderate beneficial effects associated with deployable output.

Figure 6.1 Visual evaluation matrix summary for demand management options

Scheme		SEA Topics and Objectives																					HRA Screening	WFD Assessment	Commentary
		Biodiversity				Population and Human Health			Material Assets and Resource Use		Water					Soil, Geology and Land Use			Air and Climate			Archaeology and Cultural Heritage	Landscape and Visual Amenity			
		1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1			
Effects wholly or partially captured in environmental and social costs						✓													✓							
Leakage reduction measures	Adverse																							No LSE	Compliant	Predominantly negligible effects on SEA objectives, with just three minor adverse effects relating to the use of materials and vehicle emissions during construction activities in predominately urban settings. Moderate beneficial effects associated with helping to reduce the growth in demand for water and consequently small-scale improvements to the water environment and associated users of the environment.
	Beneficial																									
Enhanced free meter optants	Adverse																							No LSE	Compliant	Predominantly negligible effects with four minor adverse effects relating to population and human health (temporary nuisance), material assets and resource use and air and climate (transport-related emission impacts).Predominantly minor beneficial effects relating to biodiversity, flora and fauna, population and human health, material assets and resource use (promoting water efficiency by customers and ensuring efficient use of water resources), sustainable water resources management, water quality, river flows and groundwater levels, air and climate (reducing greenhouse gas emissions and climate change adaptation).
	Beneficial																									
Water efficiency measures	Adverse																							No LSE	Compliant	Predominantly negligible effects with two minor adverse effects relating material assets and resource use and emissions to air (manufacture of water efficient devices and house visits). Several minor beneficial effects as a result of reducing customer demand which relate to population and human health, the sustainable management of water resources, adapting to climate change and with respect to the promotion of water efficiency.
	Beneficial																									

Figure 6.2 Visual evaluation matrix summary for supply-side options

Scheme		SEA Topics and Objectives: Biodiversity 1.1	1.2	1.3	1.4	Population and Human Health 2.1	2.2	2.3	Material Assets and Resource Use 3.1	3.2	Water 4.1	4.2	4.3	4.4	4.5	Soil, Geology and Land Use 5.1	5.2	5.3	Air and Climate 6.1	6.2	6.3	Archaeology and Cultural Heritage 7.1	Landscape and Visual Amenity 8.1	HRA Screening	WFD Assessment	Commentary
Effects wholly or partially captured in environmental and social costs						✓													✓							
Scheme 1.1.1 Drill new boreholes in Stour Valley: Upgrade Kinver BH	Adverse																							No LSE	Uncertain Effect	Two moderate adverse effects relating to biodiversity fauna and flora and sustainable water abstractions. The WFD assessment indicates that the abstraction from the Worcestershire Middle Severn - PT Sandstone groundwater body has the potential to adversely affect surface waterbodies and potentially water dependent habitats namely Checkhill Bogs SSSI (on the banks of the Spittle Brook). The adverse effects on flow may lead to a deterioration in status for fish, macro-invertebrates, macrophytes and phytobenthos, depending on their sensitivity to flow changes. Minor beneficial effects associated with population and health due to the supply of water (8.9Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.1.3a Drill new boreholes in Stour Valley: New borehole at Hinksford BH site - Blending	Adverse																							No LSE	Uncertain Effect	Four moderate adverse effects relating to potential effects regarding water (surface water flows, water quality and sustainable abstractions); and biodiversity fauna and flora (water dependent habitats). Water available for licencing is identified, however, the EA identify risks regarding the peak abstraction (as proposed) from the sandstone and the potential for spatial and environmental impacts. Minor beneficial effects associated with population and health due to the supply of water (4.9Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.1.3b Drill new boreholes in Stour Valley: New borehole at Hinksford BH site - Nitrate Treatment	Adverse																							No LSE	Uncertain Effect	Two moderate adverse effects relating to sustainable water abstractions and biodiversity fauna and flora (adverse construction effects to an LNR and operational effects to water dependent habitats). The WFD assessment indicates that the abstraction from the Worcestershire Middle Severn - PT Sandstone groundwater body has the potential to adversely affect surface waterbodies and potentially water dependent habitats namely Checkhill Bogs SSSI (on the banks of the Spittle Brook). Minor beneficial effects associated with population and health due to the supply of water (4.9l/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.1.7 Reinstate Shenstone BH	Adverse																							No LSE	Uncertain Effect	Five moderate adverse effects relating to potential effects of biodiversity, flora and fauna, the groundwater abstraction on water (river flows and sustainable water abstractions). The WFD assessment indicates that the abstraction from the Tame Anker Mease - PT Sandstone Birmingham Lichfield groundwater body has the potential to adversely affect flows for three dependent river waterbodies: Black-Bourne Brook (GB104028047000), Crane Brook - source to Footherley Brook (GB104028046480) and Footherley Brook - source to Black-Bourne Brook (GB104028046450). Minor beneficial effects associated with population and health due to the supply of water (4.9Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.1.9 New groundwater source and treatment works in Warton Unit	Adverse																							Stage 2 Required	Compliant	One major adverse effect relating to biodiversity fauna and flora and two moderate adverse effects relating to population and human health and sustainable water abstractions. HRA Stage 1 screening identifies that the associated works could have a significant effect on the River Mease SAC and will need further assessment to determine mitigation measures. The construction phase has the potential to adversely effect other designated sites including Alvecote Pools SSSI and an area of ancient woodland. Scheme construction effects which take place over the medium to long-term may have adverse nuisance and disturbance effects to the local population. Minor beneficial effects associated with population and health due to the supply of water (2Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.1.10 Reinstate Sandhills BH for potable supply including CRT releases from Chasewater	Adverse																							Stage 2 Required	Uncertain Effect	Six moderate adverse effect relating to biodiversity, fauna and flora (potential small scale construction requirements within a SSSI); water environment; material assets and resource use; and GHG emissions. HRA Stage 1 screening identifies that the associated works could have a significant effect on the Cannock Extension Canal SAC and will need further assessment to determine mitigation measures. The scheme could adversely affect the surface waters in operation and, as identified by the WFD assessment, there is a potential risk to WFD. Minor beneficial effects associated with population and health due to the supply of water (4.9Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.1.12 Treat Somerford BH water in isolation from Glade Heath.	Adverse																							No LSE	Compliant	One major adverse effect relating to energy use and GHG emissions. Three moderate adverse effects relating to biodiversity fauna, (due to pipeline construction effects on areas of ancient woodland); material assets and resource use (infrastructure requirements and intensive water treatment requirements in operation). Minor beneficial effects associated with population and health due to the supply of water (1.5Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.3.2 Drill a new borehole at Trent Valley: New borehole and headworks, transfer to Seedy Mill WTW.	Adverse																							No LSE	Uncertain Effect	Four moderate adverse effects relating to biodiversity fauna and flora and the water environment. The WFD assessment indicates that there is the potential for adverse impacts to flows in one dependent river waterbody (Pyford Brook (GB104028047250)). Given the uncertainty of the potential impact on river flows, the potential to deteriorate the ecological status could not be discounted. Minor beneficial effects associated with population and health (5Ml/d) and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.4.1 SHPW and SOPW	Adverse																							No LSE	Compliant	Five moderate adverse effects identified, these relate to construction impacts to sensitive features (Smestow Valley LNR and Shropshire Union Canal); material assets and resource use; and GHG emissions. With specific mitigation included the significance of effects could be reduced. The option involves restoring abstraction to recent actual abstraction levels and therefore no adverse effects are expected to the groundwater WFD water body or dependent surface water bodies. There will be no adverse effects on the water balance within the Teddesley Groundwater Management Unit. Minor beneficial effects associated with population and health due to the supply of water (6.35-7Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									
Scheme 1.4.5 New groundwater source and treatment works in Coven Unit as an extension of Option 1.4.1	Adverse																							No LSE	Compliant	Six moderate adverse effects identified relate to construction impacts to sensitive features (i.e. Smestow Valley LNR, Chillington Registered Park & Garden); material assets and resource use; and GHG emissions. With specific mitigation included the significance of effects could be reduced. Minor beneficial effects associated with population and health due to the supply of water (2Ml/d) for health and wellbeing, and for promotion of sustainable socio-economic development.
	Beneficial																									

Scheme		SEA Topics and Objectives: Biodiversity 1.1	1.2	1.3	1.4	Population and Human Health 2.1	2.2	2.3	Material Assets and Resource Use 3.1	3.2	Water 4.1	4.2	4.3	4.4	4.5	Soil, Geology and Land Use 5.1	5.2	5.3	Air and Climate 6.1	6.2	6.3	Archaeology and Cultural Heritage 7.1	Landscape and Visual Amenity 8.1	HRA Screening	WFD Assessment	Commentary
Effects wholly or partially captured in environmental and social costs						✓													✓							
Scheme 2.1.1 40 Ml/d capacity raw water abstraction from the Trent to Blithfield	Adverse																							Stage 2 Required	Compliant	Major adverse effect relating to biodiversity flora and fauna. HRA Stage 1 Screening identified likely significant effects on Cannock Chase SAC. Moderate adverse effect relating to biodiversity fauna and flora and population and human health. There is the potential for adverse construction effects to Blithfiled SSSI. Potential for adverse effects as a result of transferring water between different catchments and waterbodies resulting in an increased risk of spreading invasive non-native species. This may also have a knock on effect regarding the recreational value of Blithfield Reservoir. Minor beneficial effects associated with promotion of health and well-being due to water supply (3Ml/d), sustainable water resource management and improved resilience to the threats of climate change.
	Beneficial																									
Scheme 2.2.1 Increase storage at Blithfield: Increase dam height by 1m	Adverse																							No LSE	Compliant	Major adverse effect relating to biodiversity fauna and flora (due to the potential for adverse effects to Blithfield Reservoir SSSI and Stansley Wood ancient woodland); population and human health (due to adverse effects to an area with high recreational value); material assets and resource use (due to large scale demolition and construction requirements) and carbon emissions. There is the potential for moderate adverse effects regarding adverse construction effects to the local population and businesses; soil and landuse; and landscape and visual amenity (due to the significant construction area). Minor beneficial effects associated with promotion of health and well-being due to water supply (3.7Ml/d), sustainable water resource management and improved resilience to the threats of climate change.
	Beneficial																									
Scheme 2.2.2 Increase storage at Blithfield: Increase dam height by 2m	Adverse																							No LSE	Compliant	Major adverse effect relating to biodiversity fauna and flora (due to the potential for adverse effects to Blithfield Reservoir SSSI and Stansley Wood ancient woodland); population and human health (due to adverse effects to an area with high recreational value); material assets and resource use (due to demolition and large scale construction requirements) and carbon emissions. There is the potential for moderate adverse effects regarding adverse construction effects to the local population and businesses; soil and landuse; and landscape and visual amenity (due to the significant construction area). Moderate beneficial effects associated with promotion of health and well-being due to water supply (10Ml/d), sustainable water resource management and improved resilience to the threats of climate change.
	Beneficial																									
Scheme 6.1.1 40 Ml/d capacity treatment works on the Trent, with 6 month bankside storage. 40Ml/d intake on the River Trent between Rugeley and Yoxall	Adverse																							Stage 2 Required	Compliant	Five major adverse effects relating to biodiversity flora and fauna (HRA Stage 1 Screening identified likely significant effects on the River Mease SAC); construction effects on the local population; the significant anticipated resource use; carbon emissions; and archaeology and cultural heritage due to designated sites located close to the site (Church of All Saints Listed Building and Causewayed enclosure SAM). Four moderate adverse effects relating recreation and wellbeing; soil and land use; emissions to air; and landscape and visual amenity. Moderate beneficial effects are associated with promotion of health and well-being and sustainable water resource management (40Ml/d).
	Beneficial																									
Scheme 6.1.3 70 Ml/d capacity treatment works on the Trent, with 6 month bankside storage. 70Ml/d intake on the River Trent between Alrewas and Burton.	Adverse																							Stage 2 Required	Compliant	Six major adverse effect relating to biodiversity flora and fauna (HRA Stage 1 Screening identified likely significant effects on the River Mease SAC); construction effects on the local population and recreation resources; the significant anticipated resource use; carbon emissions; and archaeology and cultural heritage due to designated sites located in the planned pipeline corridor. Four moderate adverse effects relating to soil and land use; emissions to air; and landscape and visual amenity. Two major beneficial effects associated with promotion of health and well-being (associated with a DO of 60 - 70Ml/d) and sustainable water resource management.
	Beneficial																									
Scheme 7.1.2 Third Party Option: Canal & River Trust: Birmingham Blithfield surplus	Adverse																							Stage 2 Required	Uncertain Effect	One major adverse effect relating to biodiversity flora and fauns (HRA Stage 1 Screening identified likely significant effects on Cannock Chase SAC). Three moderate adverse effects relating to biodiversity fauna and flora and water quality. There is the potential for adverse construction effects to Rawbones Meadow and Blithfield Reservoir SSSIs; adverse effects as a result of transferring water between different catchments and waterbodies resulting in potential for deterioration of water quality in Blithfield Reservoir, its ecology and the risk of spreading invasive non-native species. Minor beneficial effects associated with promotion of health and well-being due to water supply (5Ml/d), sustainable water resource management and improved resilience to the threats of climate change.
	Beneficial																									
Scheme 7.3.1 Utilise Shropshire GW Scheme - Phase 6	Adverse																							No LSE	Compliant	Moderate adverse effects relating to biodiversity fauna and flora (due to construction adjacent to Actonlea/Ash Coppice, an area of ancient woodland), material assets and resource, and GHGs. Limited adverse effects under other SEA topics due to the relatively small scale construction requirement and sustainable abstraction. Moderate beneficial effects associated with promotion of health and well-being due to water supply (10Ml/d); and sustainable water resource management.
	Beneficial																									
Scheme 7.3.2 Utilise Shropshire GW Scheme - Phase 6 & 7	Adverse																							No LSE	Compliant	Two major adverse effects relating to material assets and resource use, and carbon emissions. Moderate adverse effect relating to biodiversity fauna and flora (adjacent to an area of ancient woodland and Montgomery Canal, Aston Locks - Keeper's Bridge SSSI). Limited adverse effects under other SEA topics due to the relatively small scale construction requirement and sustainable abstraction. Major beneficial effects associated with promotion of health and well-being due to water supply (50Ml/d), sustainable water resource management and moderate beneficial effects regarding resilience to the threats of climate change.
	Beneficial																									
Scheme 7.3.3 Utilise Shropshire GW Scheme - Phase 6, 7 & 8	Adverse																							No LSE	Compliant	Two major adverse effects relating to material assets and resource use, and carbon emissions. Moderate adverse effect relating to biodiversity fauna and flora (due to construction adjacent to an area of ancient woodland and Montgomery Canal, Aston Locks - Keeper's Bridge SSSI and Hodnet Heath SSSI), material assets and resource use, and carbon emissions. Limited adverse effects under other SEA topics due to the relatively small scale construction requirement (at any one location) and sustainable abstraction. Major beneficial effects associated with promotion of health and well-being due to water supply (80Ml/d), sustainable water resource management and moderate beneficial effects regarding resilience to the threats of climate change.
	Beneficial																									

Scheme		SEA Topics and Objectives																					HRA Screening	WFD Assessment	Commentary
		Biodiversity				Population and Human Health			Material Assets and Resource Use		Water					Soil, Geology and Land Use			Air and Climate			Archaeology and Cultural Heritage	Landscape and Visual Amenity		
		1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1			
Effects wholly or partially captured in environmental and social costs						✓													✓							
Scheme 7.5.1 UU River Severn	Adverse																							No LSE	Uncertain Effect	The scheme involves no construction and in operation the River Severn is used to transfer water between existing water company sites. It is assumed that all precautions to supply water of similar or better quality than that found in River Severn, as well as mitigating against the risk of invasive non-native species spread. The Water Framework Directive (WFD) assessment identifies the potential for adverse effects to the hydrological regime and WFD status in the River Severn where the water is released, information is lacking and further investigation is required. Therefore the potential for moderate adverse effects have been identified regarding biodiversity, fauna and flora and water flows anf levels. There would also be an increase in carbon emissions and material use is associated with the abstraction and treatment of water. Moderate beneficial effects associated with promotion of health and well-being due to water supply (10Ml/d), sustainable water resource management and improved resilience to the threats of climate change.
	Beneficial																									

6.1.3 Cumulative effects of options

This section provides an assessment of potential interactions, and therefore cumulative effects, between all options on the Feasible List of options (see Table 1.2) considered for South Staffs Water's Water Resources Management Plan. The interactions are categorised by the potential for cumulative effects to arise due to construction, operation and the potential for cumulative effects on European designated sites and large landscape scale features. While these categories used to identify potential interactions, where interactions are identified all the SEA objectives have been considered. The assessment of these potential cumulative effects are summarised in Figure 6.3.

Figure 6.3 Cumulative effects matrix: Supply options

Option Name

Cumulative Effects Assessment Key
Potential cumulative effects in operation - water body receptor
Potential cumulative effects to landscape scale receptor
Potential for cumulative effects to European designated sites
Potential for cumulative effects during construction
Mutually exclusive schemes

Option Name	Scheme 1.1.1 Drill new boreholes in Stour Valley: Upgrade Kinver BH	Scheme 1.1.3a Drill new boreholes in Stour Valley: New borehole at Hinksford BH site - Blending	Scheme 1.1.3b Drill new boreholes in Stour Valley: New borehole at Hinksford BH site - Nitrate Treatment	Scheme 1.1.7 Reinstate Shenstone BH	Scheme 1.1.9 New groundwater source and treatment works in Warton Unit	Scheme 1.1.10 Reinstate Sandhills BH for potable supply including CRT releases from Chasewater	Scheme 1.1.12 Treat Somerford BH water in isolation from Slade Heath.	Scheme 1.3.2 Drill a new borehole at Trent Valley: New borehole and headworks, transfer to Seedy Mill WTW.	Year 5 Scheme 1.4.1 Improve and enhance SHPW and SOPW outputs	Scheme 1.4.5 New groundwater source and treatment works in Coven Unit as an extension of Option 1.4.1	Scheme 2.1.1 40 Ml/d capacity raw water abstraction from the Trent to Blithfield	Scheme 2.2.1 Increase storage at Blithfield: Increase dam height by 1m	Scheme 2.2.2 Increase storage at Blithfield: Increase dam height by 2m	bankside storage. 40Ml/d intake on the River Trent between Rugeley and Yoxall	bankside storage. 70Ml/d intake on the River Trent between Alrewas and Burton.	Scheme 7.1.2 Third Party Option: Canal & River Trust: Birmingham Blithfield surplus	Scheme 7.1.5 Third Party Option: Canal & River Trust: Chasewater options	Scheme 7.3.1 Utilise Shropshire GW Scheme - Phase 6	Scheme 7.3.2 Utilise Shropshire GW Scheme - Phase 6 & 7	Scheme 7.3.3 Utilise Shropshire GW Scheme - Phase 6, 7 & 8	Scheme 7.5.1 Import raw water from United Utilities (Transfer via River Severn)
Scheme 1.1.1 Drill new boreholes in Stour Valley: Upgrade Kinver BH																					
Scheme 1.1.3a Drill new boreholes in Stour Valley: New borehole at Hinksford BH site - Blending																					
Scheme 1.1.3b Drill new boreholes in Stour Valley: New borehole at Hinksford BH site - Nitrate Treatment																					
Scheme 1.1.7 Reinstate Shenstone BH																					
Scheme 1.1.9 New groundwater source and treatment works in Warton Unit																					
Scheme 1.1.10 Reinstate Sandhills BH for potable supply including CRT releases from Chasewater																					
Scheme 1.1.12 Treat Somerford BH water in isolation from Slade Heath.																					
Scheme 1.3.2 Drill a new borehole at Trent Valley: New borehole and headworks, transfer to Seedy Mill WTW.																					
Year 5 Scheme 1.4.1 Improve and enhance SHPW and SOPW outputs																					
Scheme 1.4.5 New groundwater source and treatment works in Coven Unit as an extension of Option 1.4.1																					
Scheme 2.1.1 40 Ml/d capacity raw water abstraction from the Trent to Blithfield																					
Scheme 2.2.1 Increase storage at Blithfield: Increase dam height by 1m																					
Scheme 2.2.2 Increase storage at Blithfield: Increase dam height by 2m																					
bankside storage. 40Ml/d intake on the River Trent between Rugeley and Yoxall																					
bankside storage. 70Ml/d intake on the River Trent between Alrewas and Burton.																					
Scheme 7.1.2 Third Party Option: Canal & River Trust: Birmingham Blithfield surplus																					
Scheme 7.1.5 Third Party Option: Canal & River Trust: Chasewater options																					
Scheme 7.3.1 Utilise Shropshire GW Scheme - Phase 6																					
Scheme 7.3.2 Utilise Shropshire GW Scheme - Phase 6 & 7																					
Scheme 7.3.3 Utilise Shropshire GW Scheme - Phase 6, 7 & 8																					
Scheme 7.5.1 Import raw water from United Utilities (Transfer via River Severn)																					

7 SEA and Programme Appraisal

As outlined in Section 1.4, programme appraisal commences with the generation of a least-cost programme using a water resource management cost optimisation model. This process is explained in full in Section 10 of the Final WRMP.

Certain environmental and social effects were monetised and included in the option costs input to this model. South Staffs Water used the outputs from the optimisation model along with the findings of the SEA option appraisal (as well as the HRA and WFD assessments) and other factors such as regulatory requirements, customer preferences, risk and reliability, to identify a short-list of reasonable alternative programmes. To avoid double counting of effects, those effects identified in the SEA that had been monetised in the optimisation model (e.g. carbon) were not considered when reviewing the SEA findings to reach decisions on the short-listed programmes.

The alternative short-listed programmes were assessed through the programme-level SEA to help inform decisions on the preferred programme to be included in the Final WRMP19.

7.1 The least-cost programme

The matrix in Figure 7.1 lists the options included within the least-cost programme modelled for the Final WRMP and summarises the non-valued environmental effects. None of the options contained in the least-cost programme would result in significant effects. Several of the demand management components have a wide range of beneficial effects.

As described in the Final WRMP, South Staffs Water reviewed its initial least-cost programme plan against the SEA findings, including ensuring that the environmental and social effects were not 'double-counted' in both the monetisation process and the SEA, as this could potentially skew the options and programme appraisal process.

Figure 7.1 Visual evaluation matrix for the least-cost programme

Scheme		SEA Topics and Objectives																					HRA Screening	WFD Assessment
		Biodiversity				Population and Human Health			Material Assets and Resource Use		Water					Soil, Geology and Land Use			Air and Climate			Archaeology and Cultural Heritage	Landscape and Visual Amenity		
		1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	
Effects wholly or partially captured in environmental and social costs						✓													✓					
Leakage reduction measures	Adverse																							No LSE	Compliant
	Beneficial																							
Enhanced free meter optants	Adverse																							No LSE	Compliant
	Beneficial																							

In terms of cumulative effects, as shown by Figure 6.3, none of the selected options would result in adverse cumulative effects.

7.2 Alternative programmes and scenario testing

Having reviewed the least-cost programme, South Staffs Water investigated a series of alternative programmes through scenario testing to successfully demonstrate that the programme portfolio is effective and robust in meeting a range of future uncertainties. In order to successfully demonstrate that the preferred portfolio is effective and robust in meeting a range of future uncertainties, a series of

scenarios were appraised within the model. These scenarios mainly focused on stress testing the demands or available yields within the options; however, South Staffs Water also looked to understand the certainty in deliverability of options and how the programme appraisal model would behave if some feasible options were excluded from the analysis (for example, the Shropshire Groundwater Scheme and the River Trent). In addition to this, South Staffs Water optimised across a range of other objectives to understand how bringing in, for example, a greater level of resilience, or a portfolio that better delivered on customer preferences would change the base least-cost programme portfolio.

Through the scoring of some of the objectives within the multi-criteria appraisal approach, such as resilience and deliverability, South Staffs Water was able to generate a number of alternative programmes of supply options. These were then overlaid with the outputs of the company's specific WRMP customer engagement work to ensure that customer preferences around the supply and demand options were reflected within the preferred portfolio so as to demonstrate the plan has been co-created through customer engagement.

The programme appraisal modelling outputs of each of these scenarios were then considered in the context of the distribution network to ensure that customer priorities were met in relation to key performance standards for continuous supplies and excellent water quality.

Findings from the SEA (and associated HRA and WFD assessments) were used to consider the relative environmental performance of the different programmes.

7.3 The preferred programme

After reviewing the various alternative programmes from the scenario testing and their relative performance against a range of evaluation criteria, South Staffs Water decided to modify the least-cost programme and created a hybrid portfolio that it considered demonstrates a robust flexible approach to ensuring the balance of supply and demand into the future. The preferred portfolio has been shaped by what customers have told the company is important to them. In essence, this promotes demand-side opportunities and balances resilience benefits against cost for supply-side options.

The resulting preferred programme for providing the required amount of water over the 25-year period of the Final WRMP includes the SHPW and SOPW option which has potential for adverse environmental and social effects during construction (e.g. construction works within Air Quality Management Area, habitat loss during pipeline construction), however, none are considered significant. The inclusion of this option in the preferred programme ensures other requirements, such as customer preferences and improving resilience to climate change, are met to a greater extent than the least-cost programme.

The matrix in Figure 7.2 summarises the non-valued environmental effects of the preferred programme. As with the least-cost programme, several of the demand management components have a wide range of beneficial effects.

Figure 7.2 Visual evaluation matrix summary for options within the preferred programme

Scheme		SEA Topics and Objectives																					HRA Screening	WFD Assessment
		Biodiversity				Population and Human Health			Material Assets and Resource Use		Water					Soil, Geology and Land Use			Air and Climate			Archaeology and Cultural Heritage	Landscape and Visual Amenity		
		1.1	1.2	1.3	1.4	2.1	2.2	2.3	3.1	3.2	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	6.1	6.2	6.3	7.1	8.1	
Effects wholly or partially captured in environmental and social costs						✓													✓					
Leakage reduction measures	Adverse																							No LSE	Compliant
	Beneficial																							
Enhanced free meter optants	Adverse																							No LSE	Compliant
	Beneficial																							
Scheme 1.4.1 SHPW and SOPW	Adverse																							No LSE	Compliant
	Beneficial																							

The option to improve and enhance SHPW and SOPW outputs (Option 1.4.1) to achieve a deployable output of 6.35Ml/d (average) requires new headworks and a new borehole pump at SOPW borehole; replacement of three borehole pumps at SHPW existing boreholes; a new nitrate removal plant; a 6.8km nitrate effluent main to Severn Trent Water's Barnhurst Wastewater Treatment Works (WwTW); and a new effluent pumping station.

The assessment identified potential moderate adverse effects associated with the construction phase for these assets. Moderate adverse effects with respect to biodiversity, fauna and flora relate to several areas of Ancient Woodland that would be in very close proximity to one of the proposed pipelines: this will require consideration of further mitigation measures as part of the detailed scheme design to ensure the woodland and associated root zone is not adversely affected. The scheme will result in an estimated permanent land take of 1ha which may result in a loss of non-designated habitat, with potential for some minor habitat fragmentation. Moderate adverse effects were identified with respect to temporary impacts on population and human health in relation to recreation amenity as construction of the pipeline could result in short term severance of public rights of way and disturbance to places of interest such as the Shropshire Union Canal.

Operational effects of the scheme relate principally to water abstraction and treatment. There will be a minor effect on climate change and air quality, as well as material assets and resource use, due to additional energy required for pumping water and water treatment. The scheme involves restoring abstraction to recent actual abstraction levels and therefore no adverse effects are expected to the groundwater WFD water body (Staffordshire Trent Valley - PT Sandstone Staffordshire) or dependent surface water bodies. There will be no adverse effects on the water balance within the Teddesley Groundwater Management Unit. The WFD assessment also concluded that there was no risk of adversely affecting the groundwater body chemical status at groundwater body scale.

In terms of cumulative effects, as shown by Figure 6.3, none of the selected options included in the preferred programme would result in adverse cumulative effects.

7.4 Summary of HRA and WFD Assessments

7.4.1 Habitats Regulations Assessment

The HRA of the Final WRMP19 has concluded that the preferred programme is compliant with the Habitats Directive, with no likely significant effects (LSE) on European sites anticipated.

Further information is provided in the accompanying Habitats Regulations Assessment Report.

7.4.2 Water Framework Directive

The WFD assessment of the Final WRMP19 has demonstrated compliance with WFD objectives and statutory requirements for the South Staffs Final WRMP19 preferred programme.

Further information is provided in the accompanying Water Framework Directive Assessment Report.

7.5 Role of SEA in informing development of the WRMP19

The SEA, along with the findings of the HRA and WFD assessments, have been used to help inform the development of the WRMP19.

The findings of the SEA feasible option assessments were initially used (alongside the HRA and WFD assessments) to evaluate the environmental and social performance of a range of alternative programmes, as described in Section 7.2.

The likely scale of adverse and beneficial environmental and social effects for each option was considered, both on its own but also in combination with the other options included in the programme. The potential effects in combination with any other relevant projects, plans or programmes (for example, any planned major infrastructure schemes that may be constructed and/or operated at the same time and affecting the same environment and/or communities) was also assessed. This appraisal of each alternative programme also included consideration of the potential for any regulatory compliance risks associated with the Habitats Regulations and WFD, as well as other statutory obligations (including effects on SSSIs, National Parks, AONBs, heritage features and Marine Conservation Zones).

These assessments, together with the consultation responses to the draft WRMP19, helped to determine the appropriate programme for inclusion in the preferred programme. In particular, consideration of the mostly negligible adverse effects and minor beneficial effects of demand management options influenced decisions to include a greater proportion of these options in the preferred programme. The SEA, WFD and HRA assessments indicated that the SHPW and SOPW option had relatively few adverse environmental effects compared to many of the other supply-side options, and additionally provided resilience benefits. This assessment influenced the inclusion of these two options in the preferred programme - rather than the other options in the feasible list - in order to eliminate the remaining supply deficit that could not be achieved by demand management measures alone.

7.6 Delivering on national environmental policy objectives

Net environmental gain has been included as a policy principle in the Government's 25 year plan to improve the environment (published in January 2018). References to achieving net gains across the three overarching objectives for sustainable development (economic, social and environmental) along with achieving net gain in biodiversity are also set out in the updated National Planning Policy Framework (NPPF) published in July 2018 (and were previously included in the 2012 NPPF). The National Infrastructure Commission (NIC) report on water infrastructure (published in April 2018) also emphasises the economic and social benefits of improving water supply resilience.

The SEA incorporates these key policy principles within the various topic area objectives against which each option and the Final WRMP19 as a whole has been assessed. Regard has therefore been had to these national planning objectives in developing the Final WRMP19.

South Staffs Water is committed to delivering the principles set out the NPPF as each of the two supply-side scheme included in our Final WRMP19 is developed, working in dialogue with regulators, planners and stakeholders as we progress to the detailed design stage and detailed consideration of any required environmental mitigation measures.

At the WRMP19 level as a whole, South Staffs Water will continue to embed the principles of achieving net gain across the three overarching objectives for sustainable development (economic, social and environmental) in line with the government’s 25 Year Plan and the NPPF as the plan is delivered.

The SEA has had regard to South Staffs Water’s statutory duties under the Water Industry Act 1991, Wildlife and Countryside Act 1981 and Countryside and Rights of Way Act 2000 to further the

conservation and enhancement of SSSIs, along with the Water Industry Strategic Environmental Requirements (WISER) for delivery of these obligations. Effects of each option on any SSSI have been assessed and considered under the Biodiversity, Flora and Fauna SEA topic area and associated objective. The WRMP19 preferred programme will not lead to any adverse effect on any SSSI.

Additionally, it is noted that, as part of its programme of environmental improvements under its 2019 Business Plan, South Staffs Water has proposed to continue its catchment management activities at Blithfield reservoir SSSI. The catchment management programme includes the Slug Pesticide Rethink – Ideas for Nurturing Growth ('SPRING') environmental protection scheme, enabling farmers in the Blithe catchment to apply for a grant to carry out improvements on their farms that are designed to protect the environment and improve water quality. 55 farmers covering an area of 6,382 hectares in the Blithe catchment are already signed up to this scheme. Under the Water Industry National Industry Natural Environment Programme – or 'WINEP' – component of the 2019 Business Plan, South Staffs Water also intends to put in place measures to ensure the continued protection of designated sites, including Sites of Special Scientific Interest (SSSIs).

In respect of South Staffs Water's statutory duties towards Areas of Outstanding Natural Beauty (AONBs) and national policy objectives set out for protected landscapes in the Government's 25 Year Environment Plan, the WRMP19 will not have any adverse effects on Cannock Chase AONB. Measures to reduce demand for water (and therefore reducing abstraction from the water environment) included in the WRMP19 may help improve the setting of this AONB in respect to existing water sources.

8 Cumulative Effects Assessment

8.1 Preferred programme cumulative assessment

The cumulative assessments between options in the preferred programme have been carried out in line with the methodology described in Section 4. Consideration has been given to the potential for cumulative effects by reference to the cumulative effects matrix set out earlier in Figure 6.3.

Cumulative beneficial effects have been identified for all demand management options in relation to these measures acting in-combination to increase the overall demand savings, thereby contributing to sustainable abstraction. The cumulative benefits will help reduce stress on the water environment and the water settings of heritage and landscape features, as well as reducing energy use for water pumping and treatment. There is a small risk that simultaneous implementation of the demand management options could lead to cumulative adverse effects, whereby disturbance to human health, resource, and greenhouse gas emissions could increase due to supply network repair and enhancement activities. However, any such cumulative impacts would be minor, as most of these activities would be localised and small in scale, and could be effectively mitigated through careful project management and best practice construction methods.

As described in Section 6.1.3 and illustrated in Figure 6.3, as there is only one supply side option, there is no potential for adverse cumulative effects.

8.2 Cumulative effects with other relevant plans, programmes and projects

Cumulative effects of the WRMP with other relevant plans, programmes and projects have been considered. These include the following:

- South Staffs Water's Draft Drought Management Plan 2017
- Neighbouring water companies' latest available draft WRMP19 and published Drought Plans (as at September 2018)
- River Basin Management Plans (RBMP)
- Environment Agency Drought Plans
- Canal and River Trust water resources and drought plans
- Local Development Plans
- National Policy Statements and National/Regional Infrastructure Plans; and
- Relevant major projects.

8.2.1 South Staffs Water's Draft Drought Management Plan 2017

No cumulative effects with the South Staffs Water draft Drought Plan 2017 have been identified. The draft drought plan includes a number of supply-side measures to ensure that existing water sources are fully operational and to review the bulk water supplies between Severn Trent Water and South Staffs Water. No cumulative effects are anticipated with respect to these measures and the Final WRMP19 as the preferred programme does not involve any options with potential for hydrological or hydrogeological connectivity. The 2017 draft Drought Plan also includes several site-specific drought permit options; however, these are associated with the River Blithe or Blithfield Reservoir located more than 20km distant from the water supply option in the Final WRMP19 preferred programme and therefore the potential for cumulative effects is considered negligible.

8.2.2 Neighbouring water companies' WRMPs and Drought Plans

South Staffs Water's supply boundary is surrounded by Severn Trent Water's supply area. Severn Trent's Revised Draft WRMP19 and draft Drought Plan 2018 have been assessed. Severn Trent Water's plans (as at September 2018) do not include any supply-side options that would have the potential to lead to any cumulative construction or operational adverse effects. Severn Trent Water's revised draft WRMP19 and draft Drought Plan 2018 includes various demand management components, similar to those included in South Staffs Water's Final WRMP 2019. Improved water efficiency across the Midlands will provide beneficial cumulative effects in terms of reduced consumption and water abstraction, as well as reduced energy use due to less water pumping and treatment.

Cumulative effects assessment with other water company revised draft WRMP19s and published Drought Plans that may also impact (directly or indirectly) on the River Severn or River Trent catchment areas relevant to South Staffs Water has been carried out, involving consideration of the following water company plans (as at September 2018): United Utilities, Yorkshire Water, Welsh Water, Thames Water and Bristol Water. No cumulative adverse effects are anticipated in relation to any of these other water company plans and the option included in the South Staffs Water Final WRMP19 preferred programme. There may be cumulative beneficial effects in respect of water efficiency measures included in all of the plans in helping to promote water conservation messages across the Midlands and surrounding areas.

8.2.3 River Basin Management Plans (Severn River Basin District and Humber river Basin District)

Assessment of the potential for cumulative effects with these River Basin Management Plans (RBMPs) has been undertaken. The information used to carry out these assessments is considered to be the most up to date information available at the time of writing, but the assessments should be reviewed at the time of option implementation to ensure that no changes to the River Basin Management Plans have been made in the intervening period, and that the assessment, therefore, remains valid.

The Severn and Humber RBMPs describe the planned steps to implement the measures required to achieve the environmental objectives of the WFD. They provide the framework for protecting and enhancing the water environment. The SEAs[7,8] of the RBMPs determined that the plans were likely to have significant positive effects on the environment, particularly in respect of biodiversity, water, population and human health and that any local negative effects would expect to be mitigated during implementation. Therefore, there will be no adverse cumulative effects between the Severn and Humber RBMPs and South Staffs Final WRMP19. The demand management options in the Final WRMP19 may have cumulative beneficial effects in supporting some of the RBMP objectives.

8.2.4 Environment Agency drought plans

Assessment of the potential for cumulative effects of the preferred plan with the EA Drought response framework[9] has been undertaken. The information used to carry out these assessments is the most up to date information available at time of writing, but the assessments should be reviewed at the time of option implementation to ensure that no changes to the EA Drought response framework have been made in the intervening period, and that the assessment therefore remains valid.

Drought actions and triggers are given in the EA Drought response framework. Actions described include communications (internal and external), monitoring and potential drought order applications to protect the environment. Of these actions, those which are applicable for cumulative assessment with South Staffs draft preferred programme are external communications and potential environmental drought orders. However, as the South Staffs draft preferred programme involves no options that will have any effects to groundwater or surface waters the potential for cumulative adverse effects is considered negligible. External communications may have positive cumulative effects with South Staffs demand management options that have water efficiency components as drought communication

[7] Environment Agency (2015) *River basin management plan for the Humber River Basin District Strategic Environmental Assessment*: Statement of Particulars. Updated December 2015.
[8] Environment Agency (2015) *River basin management plan for* the Severn River Basin District Strategic *Environmental Assessment*: Statement of Particulars. Updated December 2015.
[9] Environment Agency (2017) *Drought response: our framework for England* June 2017

messages may reinforce each other, thereby resulting in increased demand savings and greater recognition by the public to use water wisely.

8.2.5 Canal and River Trust Management Plans

The Canal & River Trust (formerly British Waterways) is responsible for managing the various navigable waterways and canals in the South Staffs supply area and the wider assessment area considered in this SEA. The Canal & River Trust Water Resources Strategy[10] sets out the vision for how it intends to manage water resources across its network through to 2050. It contains the Trust's planned actions over the next five years relating to the canal network. The Birmingham Canal Navigations (BCN) hydrological unit partially overlaps with South Staffs water supply area. However, the main actions for the strategy are to undertake a range of modelling scenarios for the hydrological units in order of preference. Specific restoration projects or other canal developments are not detailed, however Strategic Action 4 states that appropriate water resource assessments will be undertaken aiming for "no net impact on long term water resource levels of service". No adverse cumulative effects between the Canal & River Trust Water Resources Strategy and the options included in South Staff's Final WRMP19 have been identified. At the time of writing (October 2018), the Canal & River Trust had not published its drought plans in the public domain.

8.2.6 Local Development Plans

The potential for cumulative effects with Local Development Plans relates to the SOPW and SHPW resulting in potential for moderate adverse effects associated with construction; the option is located in South Staffordshire. The South Staffordshire Local Plan[11] proposes that majority of development and service provision should be focused on the Main Service Villages. Cumulative construction effects would only arise if the timing of the infrastructure required by the WRMP scheme was to coincide. It is anticipated that these impacts could be effectively mitigated through appropriate scheduling of all the construction required so as to avoid any concurrent works.

8.2.7 National Policy Statements, National/Regional Infrastructure Plans and Proposed Major Infrastructure Projects

There are a number of National Infrastructure Projects listed for the west midlands region[12]. Most are more than 5km distance from the SOPW and SHPW option, which as described above has been identified as resulting in potential for moderate adverse effects associated with construction. The Wolverhampton Interchange involves construction of an intermodal rail freight terminal with connections to the West Coast Main Line (WCML), container storage on land located on land at Four Ashes, Staffordshire, which is within 5km of the option to improve and enhance SOPW and SHPW outputs. Cumulative construction effects would only arise if the timing of the infrastructure required by the WRMP scheme was to coincide. It is anticipated that these impacts could be effectively mitigated through appropriate scheduling of all the construction required so as to avoid any concurrent works.

There is a small risk that simultaneous implementation of the demand management options could lead to cumulative adverse effects with respect to other national or regional infrastructure plans and projects for example those that relate the national road and rail networks. However, any such cumulative effects would be minor, as most of the demand management activities would be localised and small in scale, and could be effectively mitigated through careful project management and best practice construction methods.

[10] Canal & Rivers Trust (2015) Putting the water into waterways: Water Resources Strategy 2015-2020. f
[11] https://www.sstaffs.gov.uk/planning/south-staffordshire-local-plan.cfm
[12] https://infrastructure.planninginspectorate.gov.uk/projects/West%20Midlands/

9 Mitigation and Enhancement

9.1 Overview

Key stages of the SEA process include Task B5: Mitigating adverse effects and Task B6: Proposing measures to monitor the environmental effects of implementing a plan or programme, as well as Stage E: Monitoring the significant effects of the plan or programme on the environment. The sections below describe how Task B5: Mitigating adverse effects tasks have been or will be addressed, as applicable and the appropriate mitigation measures are implemented for any adverse effects identified.

9.2 Mitigation Measures

Mitigation may be defined as a measure to limit the effect of an identified significant impact or, where possible, to avoid the adverse impact altogether. Consideration of mitigation measures has been an integral part of the SEA process and has informed development of the draft Water Resources Management Plan. The SEA appraisals set out in Sections 6 and 7 above have been based on the assessment of residual impacts, i.e. those impacts likely to remain after the implementation of identified mitigation measures. Certain assumptions have been made regarding mitigation in carrying out the assessments, notably:

- Where suitable mitigation measures have been identified, these have been taken into account, such that the resultant residual impact has been determined in this SEA; and
- In line with recommendations made in the UKWIR SEA Guidance[13], the SEA appraisals have assumed the implementation of reasonable mitigation measures such as operation of water sources in line with regulatory requirements, the use of good construction practice and mitigation measures such as:
    - Best practice mitigation measures;
    - Resources for construction of the scheme would be sourced locally where possible;
    - Appropriate pipeline laying techniques regarding river crossings etc.;
    - Footpath diversions established regarding construction work including pipelines; and
    - Siting of temporary and permanent works to minimise impacts on setting of heritage and landscape features.

The mitigation measures to address adverse residual effects as discussed further below, would, in some cases, be implemented through the planning process. In this way, effective mitigation plans can be developed to minimise many of the residual adverse effects currently identified in the SEA appraisals. Site specific mitigation to address identified residual adverse effects has only been identified with respect to the SOPW and SHPW option. This mainly relates to potential construction effects as outlined below.

9.2.1 Biodiversity, fauna and flora

Moderate adverse effects were identified with respect to biodiversity, fauna and flora due to the proximity of the proposed nitrate effluent main to two small areas of ancient woodland. This will require careful detailed design and additional mitigation measures to protect these features and ensure the woodland and root zone is not adversely effected. The construction work would also present potential for temporary, medium to long term effects to non-designated habitats including hedgerows with associated temporary fragmentation effects and the estimated permanent land take of 1ha may result in a loss of non-designated habitat. In addition to standard best practice mitigation measures, careful detailed design and any required habitat compensation to offset the residual impacts should be implemented.

[13] UKWIR (2012) Strategic Environmental Assessment and Habitats Regulations Assessment of Water Resources Management Plans (UKWIR Project WR/02/A)

9.2.2 Population and human health

Moderate adverse effects were identified with respect population and human health in relation to the recreation. Construction of the pipeline could result in short term severance of public rights of way and nearby places of interest such as Shropshire Union Canal. In addition to provision of footpath diversions and reinstatement following construction completion, careful siting and use of screening where work locations are in proximity sensitive receptors should be employed e.g. Shropshire Union Canal.

9.2.3 Archaeology and cultural heritage

There remains a risk to unknown assets from the excavation of pipeline routes and at other construction sites. Further investigation and liaison with Historic England would be required as well as appropriate mitigation measures such as amendment of pipeline routes and routing pipelines to follow existing roads wherever possible.

9.2.4 Air and Climate

Adverse effects concerning air quality and carbon emissions are less spatially specific. Air quality effects may be mitigated through improved transport logistics, and routing to avoid sensitive areas such as AQMAs. Opportunities to generate energy from renewable sources, energy recovery and renewable energy options will be positively explored as part of the development of the detailed design of options included in the plan.

9.3 Mitigation of cumulative impacts with other plans and programmes

Section 8 explains the potential cumulative impacts with other plans. Potential water resource impacts that could arise due to future, as yet, unknown new abstractions from common sources would be assessed and considered by the EA as informed by detailed environmental assessment work as part of the abstraction licensing and water resources planning processes.

Liaison with local planning authorities will also be essential to assess any required mitigation measures from any identified cumulative effects on development plans and projects as discussed in Section 8.

10 Monitoring proposals

A key stage of the SEA process with regard to monitoring is Stage E: Monitoring the significant effects of the plan or programme on the environment. The sections below describe how this task has been addressed and how South Staffs Water proposes to monitor the effects of implementation of the WRMP, noting that no significant adverse effects have been identified).

10.1 Monitoring Requirements

Monitoring will be required to track the residual environmental effects to show whether they arise as anticipated in the SEA appraisal, to help identify any adverse impacts and trigger deployment of any of the mitigation measures.

Monitoring for options identified in the preferred plan is set out in Section 10.2. These monitoring recommendations are based on the current understanding of the option design. As options are brought forward for development, further monitoring requirements may be set out in planning applications, or in South Staffs voluntary best-practice monitoring plans accompanying scheme development. This will be discussed with relevant key regulatory bodies and stakeholders. In practice, close dialogue should occur between South Staffs Water, EA, NE, Historic England and any affected third parties to agree the appropriate scale and duration of such scheme-specific monitoring activities proportionate to the assessed environmental risks.

10.2 Proposed Monitoring

Table 10.1 lists the potential effects that may arise from implementation of the Final WRMP19 and which require monitoring in accordance with the SEA Regulations, and the ownership of the monitoring activity.

Key monitoring parameters at the strategic WRMP level will be those relating to the abstraction of water and the effects that this may have on waterbodies and their functions as habitats. There are also direct potential effects on humans, the built environment, terrestrial habitats, the atmosphere and heritage assets, which may arise from construction activities and/or option operation. These parameters should, therefore, be included within the monitoring programme where it is practicable to do so. Extensive primary data collection is neither feasible nor appropriate for this programme level of monitoring, and use should be made where possible of existing datasets and monitoring regimes.

Site-specific monitoring requirements for the supply option included in the preferred plan (SOPW and SHPW option) will be developed in the detailed design accompanying scheme development (including scheme-specific HRA and WFD assessments) during the planning process closer to the time of implementation.

The plan will include:

- Scheme-specific monitoring requirements and targets that focus on scheme-specific risks, habitats, species and sites; and
- Strategic, regional and local monitoring requirements and targets to ensure that monitoring is conducted at a suitable spatial scale that reflects the scale and risks of each scheme and the overall plan.

The monitoring plan will be owned and implemented by South Staffs Water and will be developed to reflect phasing of the plan. The monitoring plan will be further developed beyond this report during the implementation of this plan in consultation with the Environment Agency and Natural England to make best use of available data, to share existing monitoring locations and locate new monitoring sites where possible in locations that not only meet scheme-specific requirements but provide additional value to the Environment Agency and Natural England’s monitoring programmes.

Table 10.1 Proposed SEA monitoring parameters – strategic WRMP monitoring

Impacted Receptor	Monitoring Indicator	Information Source	Responsibility
Water resources, water quality, biodiversity	Proportion of surface waters and groundwater waterbodies at 'Good' WFD status	Environment Agency online Catchment Data Explorer for RBMP2 for the year 2015 and any updates	Environment Agency
	Protected species and habitats surveys	Site specific during detailed design stage to confirm presence/likely absence of protected species	South Staffs Water
	Biological monitoring (macrophytes, macroinvertebrates, fish)	Environment Agency database, monitoring completed by South Staffs Water	Environment Agency, South Staffs Water
	Condition of European Sites and SSSIs according to Natural England condition assessments	Natural England favourable condition assessment tables	Natural England
	Progress against the South Staffs Water biodiversity targets	Biological monitoring and surveys	South Staffs Water
	Surface water and groundwater levels	Monitoring and comparison with historic records	South Staffs Water, Environment Agency
Climate Factors	Net greenhouse gas emissions per Ml (million litres) of treated water (kg CO2 equivalent emissions per Ml)	Reported annually by South Staffs Water	South Staffs Water
Transport	Transport fleet fuel consumption, emissions and mileage	Routinely monitored by South Staffs Water	South Staffs Water
Nuisance/ Community Amenity Effects	Scheme level community disruption due to construction works / during operation (where applicable)	Monitored through an Environmental Management Plan	South Staffs Water
	Complaints logged during construction	Compile data held by South Staff (and contractors) and Local Authority Environmental Health Officer	South Staffs Water, Local Authority

Impacted Receptor	Monitoring Indicator	Information Source	Responsibility
	Customer satisfaction surveys	Responses gauged through and reported in South Staffs Water's annual performance processes	South Staffs Water
	Surveys of recreational and other amenities likely to be affected	Survey responses pre- and post- construction	South Staffs Water
Air Quality	Scheme-specific monitoring during construction works / during operation (where applicable)	Environmental Management Plan	South Staffs Water
	Changes in background air quality	Defra Automatic Urban and Rural Network, Local Authority monitoring	Defra, Local Authority data sources
Resource Use	Proportion of demolition materials sent to land fill or recycled	Part of Construction Environmental Management Plan	South Staffs Water (contractors)
	Proportion of construction build materials derived from recycled materials	Part of design criteria for new builds	South Staffs Water
Landscape and visual amenity	Loss of land within AONB, National Park or protected views	Landscape and Visual Impact Assessments	Complete assessments in consultation with Natural England, Local Authority and Historic England
	Changes to townscape and views	Townscape assessment	As above
Cultural Heritage	Loss or change in condition of buried archaeology	Archaeological Written Scheme of Investigation	Complete assessment in consultation with Historic England and Local Authority
		Environmental Management Plan	South Staffs Water
	Change in condition of existing heritage assets	Monitoring of heritage assets such as Listed Buildings and Scheduled Monuments, Registered Battlefields, Registered Parks and Gardens, in particular the 'Heritage at risk' register.	Historic England

These proposed indicators would form the core component of the monitoring programme to assess whether the identified effects in the SEA are occurring as anticipated, or whether it is giving rise to

greater or lesser effects (adverse or beneficial). In turn, the monitoring may identify changes to the mitigation measures necessary to minimise adverse effects and/or modifications to scheme design or operation to further augment beneficial effects.

The SEA Directive states that monitoring must enable appropriate remedial action to be taken. For the monitoring programme to be effective, there must therefore be a mechanism in place to detect trends and to ensure that action is taken where trends are progressively adverse.

As options are brought forward for development, further specific monitoring requirements may be incorporated in detailed designs and plans accompanying scheme development (including, where applicable, formal applications for any required environmental permits or abstraction licences, planning permission, as well as any scheme-specific HRA and WFD assessments). These will be discussed with relevant regulatory and statutory bodies and stakeholders to agree the appropriate scale and duration of such scheme-specific monitoring activities proportionate to the assessed environmental risks.

Five-yearly assessment of monitoring and any measures taken would be included within the SEA for the subsequent Final WRMP development. Through the proposed monitoring and analysis of the results obtained over the five-year period, the SEA will inform and influence the development of the WRMP for future periods.

11 Quality Assurance

ODPM Guidance on SEA contains a quality assurance checklist to help ensure that the requirements of the SEA Directive are met. The checklist is reproduced in Appendix E, demonstrating how this Environmental Report meets the requirements.

12 Conclusions and Next Steps

Through application of the SEA process (and associated HRA and WFD assessments) from the very outset, South Staffs Water has actively considered environmental and social effects throughout the development of its Final WRMP19 and consulted regularly with regulators, stakeholders and customers to seek their views on the emerging findings. The SEA process complies with the regulatory requirements and national best practice guidance. The assessments have been based on a broad range of objective environmental and social criteria, developed through public consultation, to ensure all options were considered on a consistent basis, in line with the meeting the requirements of the SEA Directive and national SEA Regulations.

By integrating environmental and social assessment into the development of the Final WRMP19, a long-term sustainable water resource plan has been produced that maintains water supply reliability for South Staffs Water's customers without unacceptable adverse effects on the environment or local communities.

As well as protecting the environment, the Final WRMP19 provides opportunities for environmental enhancement through various measures, in particular:

- Actively pursuing further measures to reduce leakage from the water supply system and customer properties, reducing water abstraction from the environment
- Extending the promotion of free water meters to more customers and helping customers reduce their demand for water.

South Staffs Water formally invited the statutory consultation bodies, stakeholders and the public to comment on the draft WRMP19 and the SEA Environmental Report in early 2018. Comments made were considered in producing the Final WRMP19, acknowledging that environmental and social considerations are not the only determining factors in formulating the WRMP. Any significant changes were assessed and reported in this Environmental Report. The SEA findings were taken into account in developing the Final WRMP19.

Once the Final WRMP is published, South Staffs Water will also publish a SEA Post Adoption Statement, describing how the SEA and the responses to consultation have been taken into account during the preparation of the WRMP19. This statement will describe how environmental considerations have been integrated in the WRMP19 and explain any changes made or alternatives rejected. Information will also be provided on the environmental monitoring to be carried out during the implementation of the WRMP19 to track the environmental effects of the WRMP19 and to trigger appropriate responses where effects are identified.

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