Impact of Housing Growth on Water Supply and Water Quality at European sites – Update to information contained within the West Midlands RSS Phase II Revision HRA

FINAL

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Executive Summary

TEC was commissioned by the West Midlands Regional Assembly to carry out a supplementary study to update the findings and recommendations from the Habitats Regulations Assessment (HRA) of the Regional Spatial Strategy (RSS) Phase Two Revision (2007), hereafter referred to as the Phase Two HRA (2007).

The Phase Two HRA (2007) raised concerns regarding the potential for adverse impacts on several European sites in the West Midlands as a consequence of the water treatment and water resource requirement of the proposals within the RSS. Recommendations for suitable avoidance and mitigation measures were made to ensure that the RSS Phase Two would not have an adverse effect on the integrity of any European site as a result of increased water demand or deterioration of water quality. Because the HRA pre-dated the relevant draft WRMPs (Welsh Water, Severn-Trent, South Staffordshire), some relevant Reviews of Consents (Environment Agency) and increases in planned levels of housing (under the NLP scenarios), it was necessary to revisit these recommendations. In addition the Countryside Council for Wales requested additional consideration of implications for the River Usk SAC.

This report documents the results of a study carried out to review the draft WRMPs and associated Strategic Environmental Assessments/Habitats Regulations Assessments, Statements of Response, Reviews of Consents, the relevant Catchment Abstraction Management Strategies and other technical updates provided by the Environment Agency. Consultation took place with the West Midlands Regional Assembly, Government Office West Midlands, Welsh Assembly Government, Severn Trent Water, South Staffs Water, Welsh Water, the Environment Agency, Natural England and the Countryside Council for Wales.

Key conclusions with respect to the implications of the RSS Phase Two Preferred Option and the additional housing proposed under the NLP scenarios are as follows:

With respect to implications for water supply to European Sites:

There would be no Adverse Effect on Integrity (AEOI) for:

- River Usk SAC
- River Dee and Bala Lake SAC
- River Mease SAC

It is not possible to reach this conclusion for:

- River Wye SAC - No AEOI from the proposed quantum of growth overall as this is within current headroom. In some locations, accommodation of required sustainability reductions may require more costly measures which have not yet been identified. Welsh Water can supply existing customers and accommodate proposed growth with sustainability reductions in place apart from in Pilleth WRZ. RSS Policies need to ensure this issue is dealt with through the Hereford LDF.
- Severn Estuary SCI, SPA, Ramsar – Precautionary policy required until the results of the Review of Consents & Water Framework Directive (WFD)/ Restoring Sustainable Abstraction (RSA) Sensitivity Analysis can be made available to the statutory nature conservation bodies.

With respect to changes in water quality

There would be no Adverse Effect on Integrity (AEOI) for:

- Pasturefield Saltmarsh SAC.

It is not possible to reach this conclusion for:

- River Mease SAC,
- River Wye SAC and
- Severn Estuary sites

Recommendations to ensure no adverse effect on integrity of European Sites relating to water supply

It is recommended that the RSS should include the following requirements to ensure no AEOI on the River Wye SAC and Severn Estuary sites due to increased demand for water in the region:

a) A requirement for Local Authorities (particularly Herefordshire) to engage in early consultation with Water Companies and the Environment Agency concerning site allocations to ensure development is located in WRZs where there is surplus water available after the required sustainability reductions have been implemented. Mandatory water cycle studies would demonstrate this.

b). A requirement to avoid any development within the Pilleth WRZ which increases the total demand for water.

c). A commitment to be enshrined in the LDFs that development must be conditional on assured water supplies from sources that would not have an adverse effect on European sites.

In addition, considering the concerns raised by the EA with respect to locating a high proportion of housing in the River Severn Water Resource Zone (especially under the NLP options) it is prudent to continue to support the water conservation and efficiency measures set in policy SR3 of the draft RSS.

Future critical review of this issue and of the Water Resources Management Plan will be necessary, for four reasons:

- the Water Resources Management Plans will be revised and finalised during 2009;
- Severn Trent Water has now committed to undertake a HRA of their WRMP;
- the assumptions upon which the Plan is based (particularly with respect to future water efficiencies and water metering levels) may require revision;
- future housing growth and other development figures – both within the RSS and in other regions – may challenge the conclusions in the Water Resources Management Plans.

It is likely that, at least for the Severn Estuary sites, the gaps in information will be filled before the Secretary of State reaches the process of adopting the plan. There should be opportunity for consideration of RoC conclusions and FWRMP during the period of Proposed Changes and an opportunity to a replace more the precautionary approach with definite policies.

Recommendations relating to implications for water quality

There is a lack of information regarding future water infrastructure needs in relation to water quality. Clearer understanding is required of constraints, coupled with clarification of the relationship between particular wastewater treatment works, drainage area networks and individual European sites. RSS Policies will need to ensure clear that any specific local issues that arise are tackled through the LDF process, but with strong mitigation policies in place (see below) it is possible to

conclude that there will be no AEOI for the sites identified. Although it is difficult to identify, at a broad scale, those areas where wastewater treatment works and drainage area networks may not be easily adapted to accommodate the growth proposed without an adverse impact on the integrity of European sites, it is important that concerted action should be undertaken to clarify such constraints. In the meanwhile recommendations have been suggested for inclusion within the RSS to allow local planning authorities to tackle this problem through the LDF process.

The following actions are recommended to support the ongoing development of the RSS:

- A comprehensive update of the EA technical paper by the EA to re-examine the implications of planned development with respect to pressure on sewage treatment works and to identify any European sites which could be adversely affected in light of the recent RoC progress.
- Ongoing, concerted action to develop an approach to clarify specific capacity constraints around individual wastewater treatment works and drainage area networks, in relation to projected housing and other development. Clearer understanding of such constraints, coupled with clarification of the relationship between particular wastewater treatment works and drainage area networks and individual European sites, would facilitate the identification of areas where development might give rise to adverse effects.

In the absence of a clear strategic understanding of the relationship between the potential impacts of housing and development growth on water quality a precautionary approach will have to be taken within the regional HRA process. The RSS should:

a) Require water cycle studies to be mandatory for all areas where likely significant effects on a European site are possible and these should include a Surface Water Management Plans.

b) Require local authorities to link delivery of housing with review of the capacity of STWs and the sewerage network, and plan improvements to these as necessary to ensure that water quality at European Sites is not compromised. Those Local authorities with European Sites that could be at risk need to adopt a precautionary approach to development and must test plan alternatives.

c) Reinforce the need for more detailed assessment at a local level and include a policy allowing a lower housing allocation where it is the only effective mitigation to ensure no adverse effect on the integrity of European sites

In addition, in many areas, excessive surface water flows to drains create most of the significant flooding and water quality incidents. The RSS already supports sustainable drainage systems but further consideration should be given to strengthening the RSS in this regard.

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1 Introduction

The Habitats Regulations Assessment (HRA) of the West Midlands Regional Spatial Strategy Phase Two Revision (referred to hereon as the 'Phase Two HRA 2007') was completed in October 2007 and identified a number of possible adverse impacts on European Sites in the region as a result of increasing demand on water resources and water treatment infrastructure due to proposed development. These included changes in aquatic communities and the quality of the aquatic environment associated with low flows, concentration of pollutants, reduced oxygen levels, eutrophication and fish entrainment.

Recommendations for suitable avoidance and mitigation measures were provided in to ensure that the RSS Phase Two would not have an adverse effect on the integrity of any European site as a result of increased water demand or deterioration of water quality. Because the HRA pre-dated the relevant draft WRMPs (Welsh Water, Severn-Trent, South Staffordshire), some relevant Reviews of Consents (Environment Agency) and increases in planned levels of housing (under the NLP scenarios), it was necessary to revisit these recommendations. In addition the Countryside Council for Wales requested additional consideration of implications for the River Usk SAC.

This report documents the results of a supplementary study carried out in 2009 to update the findings and recommendations from the original Phase Two HRA 2007, based on review of the draft WRMPs and associated Strategic Environmental Assessments/Habitats Regulations Assessments, Statements of Response, Reviews of Consents, the relevant Catchment Abstraction Management Strategies and other technical updates provided by the Environment Agency. Consultation also took place with the West Midlands Regional Assembly, Government Office West Midlands, Welsh Assembly Government, Severn Trent Water, South Staffs Water, Welsh Water, the Environment Agency, Natural England and the Countryside Council for Wales.

This study considers the impact of the Phase Two Revision Preferred Option and also the three potential growth scenarios presented by NLP, which propose between 417,100 and 445,600 additional housing units up to 2026. These represent housing allocations which build on, and are between 51,500 and 80,000 higher, than the draft West Midlands Phase 2 Regional Spatial Strategy Revision. An assessment carried out by Baker Shepherd Gillespie[1] reinforced possible implications for European Sites due to changes in water supply and quality, so it was necessary to give further consideration to the implications of the NLP scenarios.

The purpose of the study was to identify whether any additional measures would be needed in the RSS to ensure the integrity of European Sites in the region with respect to water supply and quality.

The contents of the report are as follows:

- chapter 1 (this chapter) introduces the study and explains the methodology used;
- chapter 2 summarises the findings from the Phase Two Revision HRA and identifies the sites for which changes in water supply or quality were identified as a concern;

[1] Baker Shepherd Gillespie (2008) Development of Options for the West Midlands RSS in Response to the NHPAU Report Government Office for the West Midlands Volume 7: HRA Assessment Report

- chapter 3 presents the results of a review of the draft WRMPs from the perspective of European Sites;
- chapter 4 presents the results from relevant Environment Agency assessments, including reviews of consents;
- chapter 5 considers possible in-combination effects associated with other plans and projects;
- chapter 6 summarises conclusions concerning possible impact on site integrity; and
- chapter 7 makes recommendations for further measures to avoid or mitigate adverse effects on the integrity of European Sites.

1.1 Methodology

The agreed brief for this study was to establish and examine the information that has become available since the Phase Two HRA 2007 was completed in October 2007, and to consult with the water companies, relevant interest groups and stakeholders in order to establish whether European sites might be adversely affected. Then to consider whether any additional mitigation might be required to ensure the integrity of European Sites in the region with respect to water supply and quality.

A full set of references is included in section 10, but key sources of information used in this work included:

- draft Water Company WRMPs (dWRMPs);
- Severn Trent and South Staffordshire Statements of response (which became available during this study);
- SEAs of the dWRMPs;
- HRA of the Welsh Water dWRMPs;
- review of Consents information;
- updates to the CAMS review;
- updates to the technical papers issued by the Environment Agency in 2007;
- notes from meetings with the water companies, the EA, CCW, NE, Government Office, the WMRA and the Welsh Assembly; and
- emails and phone calls with the Environment Agency, the Environment Agency Wakes, the Countryside Council for Wales and Natural England.

The focus of the study is on European sites and the environmental conditions required for integrity to be maintained, as it relates to water supply and quality. The work carried out by TEC in 2007 and subsequent HRA work in the region has underpinned the necessary understanding of the European sites.

Significance of effect is notoriously difficult to assess at the strategic level and it is a recognised problem that policies and proposals within Regional Spatial Strategies often provide insufficient detail to allow appropriate assessment of individual component projects, for example, the precise location of new housing may not be known.

This study has attempted to deal with proposals that require a strategic response and to address the risk of such effects at a regional level (for example; the quantum of growth allocated to a particular WRZ). The purpose is to avoid impact at the higher

possible point in the decision making hierarchy as the opportunity to avoid adverse effects at source decline as one moves from a national, to regional, to local level, until damage limitation through mitigation and ultimately compensation, are the only remaining options.

However, we recognise, that in some cases, any effects are likely to be localised and/or there is more flexibility over location and so these issues can be more appropriately assessed at a lower tier of planning. These are the situations where there could be an adverse impact from the implementation of a Policy but it is not an inevitable consequence of the Policy. In this latter circumstance, the appropriate assessment of the Regional Spatial Strategy should identify the risk of effects but can assume that Habitats Regulations Assessment of lower-level strategies or the individual schemes will provide the information to allow rigorous appropriate assessment. In this situation, further refinement of the proposals at local level will be required to ensure that adverse impacts are identified and avoided or mitigated – but it is the conclusion of the Habitats Regulations Assessment of the Regional Spatial Strategy that the Policy could be implemented without inevitable adverse impacts on sites of international importance for nature conservation.

The information supporting this study has been changing dramatically even whilst we have been undertaking the assessment. For example; Severn Trent Water's statement of response involved a complete amendment of options to be included in the final WRMPs (FWRMPs). The WRMP's have not been finalised, many of the Review's of Consents are still to be completed and the plan can still be dramatically changed in regulatory steps to come. This assessment has been based on information available when it was undertaken. The conclusions and the recommendations may need to be re examined in later stages of the plan development, for example, when the Secretary of State is considering proposed changes.

2 Findings from the Phase Two Revision HRA

2.1 Potential effects on integrity

2.1.1 Water resources

The Phase Two HRA 2007 report concluded that the integrity of several European sites could be affected, due to predicted future Water Resource Zone (WRZ) deficits and the housing and economic growth envisaged in this and adjacent RSSs. These sites, and the reasons for which possible risks to integrity were identified, are summarised in Table 1. Full details of European sites assessed in this report are included in the Phase Two HRA 2007 and for the sake of brevity have not been replicated here.

In addition to these sites, which were highlighted in the Phase Two 2007 HRA report, CCW later provided comments (in July 2008) to Government Office requesting further consideration of the effects on the River Wye SAC and River Usk SAC:

> "*Consideration should also be given in this assessment to Dwr Cymru/Welsh Water and Severn Trent's influence on the Usk SAC (in respect of water transfers from the Wye)*".

Consideration of implications for the River Usk SAC has therefore also been included.

Table 1 Risk to site integrity from an increase in water demand (this is sourced from the Phase Two HRA 2007 and is provided for reference. This does not constitute the conclusions of this report)

European site	Baseline Situation as noted in the Phase Two HRA (2007)	WRZ – Risk of deficit with housing and economic growth in preferred option[2]	Information from CAMS	Possible in-combination impacts from other plans & projects	Risk to site integrity (as concluded in the Phase Two HRA (2007)
River Dee and Bala Lake SAC.	The main issues of concern are with fish entrainment and with the potential for some abstractions to reduce flows.	Surplus of water available within the Oswestry and Ellesmere WRZ.	No information available relevant to site.	Cheshire and Merseyside source water from the River Dee. Predicted household growth in this area will place additional demands upon available resources. Dee Valley WRZ is sensitive to household growth.	RoC indicates that some current licences are having an effect and will have to be modified. Possible cumulative adverse effect on integrity as Welsh Water, Severn Trent Water and Dee Valley Water all take abstractions from site. **Note: Welsh water do not provide the West Midlands region with abstractions from the Dee**
River Mease SAC	All aquatic features of this site require suitable flow conditions to maintain favourable status. RoC has been undertaken.	Housing growth and other demands mean WRZ in deficit by 2024 and in critical period by 2009.	No information available relevant to site.	Draft East Midlands Plan proposes housing development in Coalville, Swadlincote and Ashby de la Zouch. Increased demands could affect water levels in the Mease.	Yes: review of consents has confirmed risks from future abstraction. High levels of household growth could have a significant effect if abstraction is needed from the River.
River Wye SAC	All aquatic features of this site require suitable flow conditions to	Small deficit at critical periods with housing proposed, but Habitats Directive Reviews not	No relevant information available.	Growth in South Wales and Herefordshire will require increased abstractions from this catchment. Water is also transferred from the	The River Wye is subject to a review of licences and consents under the Habitats Directive which could affect future resource availability.

[2] Information from Environment Agency (no date) West Midlands Regional Spatial Strategy. The impact of Housing Growth on Public Water Supplies.

European site	Baseline Situation as noted in the Phase Two HRA (2007)	WRZ – Risk of deficit with housing and economic growth in preferred option[2]	Information from CAMS	Possible in-combination impacts from other plans & projects	Risk to site integrity (as concluded in the Phase Two HRA (2007)
	maintain favourable status. The EA are reviewing abstractions that affect this site through the National Environment Programme.	complete.		River Wye to Cardiff so there is additional demand pressure from growth in South Wales.	Although WRZ is currently stated to be in surplus during the plan period, current abstractions are affecting the site. It is likely that control rules will be modified that will restrict existing abstractions by Welsh Water. Growth in this and adjacent regions may result in the need for abstractions that pose a risk to site integrity.
Severn Estuary cSAC,	Reduction in water supply has the potential to adverse effect qualifying features especially migratory fish such as the river lamprey.	With growth envisaged WRZ goes into deficit between 2014 – 2016 and 2020-2024.	Availability status of "no water available" has been applied to the Severn Corridor in its entirety.	SW RSS growth adds more pressure to abstractions from lower reaches of the Severn. Economic development proposed under the RES is also likely to increase abstraction requirements in towns along the Severn.	Severn system currently under stress. WRZ Likely to go into deficit in near future. Housing and economic growth poses risk to site integrity and water demand increases from the Severn Corridor. Habitats Directive Review currently underway which may limit existing abstractions and be a tension in areas of growth.
Severn Estuary SPA	Reduction in water flows in the Severn has the potential to affect the extent of habitats in the estuary and the extent and distribution of species that act as a food source for internationally important bird	With growth envisaged WRZ goes into deficit between 2014 – 2016 and 2020-2024.	Availability status of "no water available" has been applied to the Severn Corridor in it's entirely.	SW RSS growth adds more pressure to abstractions from lower reaches of the Severn. Economic development proposed under the RES is also likely to increase abstraction requirements in towns along the Severn.	Severn system currently under stress. WRZ Likely to go into deficit in near future. Housing and economic growth poses risk to site integrity and water demand increases from the Severn Corridor. Habitats Directive Review currently underway which may limit existing abstractions and be a tension in areas of growth.

European site	Baseline Situation as noted in the Phase Two HRA (2007)	WRZ – Risk of deficit with housing and economic growth in preferred option[2]	Information from CAMS	Possible in-combination impacts from other plans & projects	Risk to site integrity (as concluded in the Phase Two HRA (2007)
	populations.				
Severn Estuary Ramsar	Reduction in water flows in the Severn may affect the extent of habitats, estuarine communities and certain qualifying species	With growth envisaged WRZ goes into deficit between 2014 – 2016 and 2020-2024.	Availability status of "no water available" has been applied to the Severn. Corridor in its entirety.	SW RSS growth adds more pressure to abstractions from lower reaches of the Severn. Economic development proposed under the RES is also likely to increase abstraction requirements in towns along the Severn.	Severn system currently under stress. WRZ Likely to go into deficit in near future. Housing and economic growth poses risk to site integrity and water demand increases from the Severn Corridor. Habitats Directive Review currently underway which may limit existing abstractions and be a tension in areas of growth.

2.1.2 Water Quality

As a result of the Phase Two HRA (2007), it was concluded that the integrity of the Midlands Meres and Mosses Phase I & II Ramsar site would not be adversely affected as a result of the plan (see Table 2). Since the HRA was carried out, local issues associated with potential pollution of the Cannock Extension Canal SAC have been resolved. These sites are therefore not considered further in this report.

The Phase Two HRA (2007) could not conclude that there would be no adverse effect on the integrity of Pasturefields Salt Marsh SAC, River Mease SAC, River Wye SAC, or the Severn Estuary cSAC & Ramsar sites, because the plan had the potential to reduce water quality at a number of sites by putting pressure on sewage treatment infrastructure and by increasing the risk of diffuse pollution reaching surface water sewers (See Table 2).

A number of caveats were included in the HRA report because of the lack of data and the "broad brush" nature of the information provided in the EA technical paper[3].

Strong avoidance recommendations and mitigation measures were provided in the Phase Two HRA 2007 to ensure no adverse effect on integrity from the plan and from deterioration of water quality despite the uncertainty. However, the HRA also stressed the need to revisit these recommendations when further information was available, including Reviews of Consents by the Environment Agency and reviews of the once the Habitats Review of Consents was complete and when further work had been carried on the capacity of sewage treatment works[4] and the sewerage system in districts identified for significant growth.

[3] Environment Agency (No Date) West Midlands Regional Spatial Strategy (RSS 11) The Impact of Housing Growth on Water Quality and Waste Water Infrastructure

[4] This was a specific recommendation with the EA water quality technical paper - Environment Agency (No Date) West Midlands Regional Spatial Strategy (RSS 11) The Impact of Housing Growth on Water Quality and Waste Water Infrastructure

Table 2 Effects on the integrity of European sites due to possible declines in water quality (this is sourced from the Phase Two HRA 2007 and is provided for reference. This does not constitute the conclusions of this report)

European site	Water quality issues and risk to integrity	Effects of the plan	Trends and in combination effects	Effect on integrity
Cannock Extension Canal SAC	Impacts on water quality caused by surface water run-off, including sedimentation. Good water quality is needed to support floating water-plantain *Luronium natans.*	Increased traffic on the A5 & B4154, which may result from population growth and increased economic activity (promoted by policies under the chapters on Communities for the Future and Prosperity of All) could exacerbate this problem unless measures are taken to reduce road run-off.	The RES aims to create a tourism and regeneration plan for canal-related activity within the Black Country and Birmingham which may create an opportunity for water quality improvements. 'Looking Forward: The Black Country in 2033' identifies the potential of the canal network to promote new and heritage uses which may lead to land use changes affecting levels of runoff.	Increased contaminated road run off possible as traffic increases. However, little information available on either specific traffic increases on these roads or how increases in traffic relate to increases in diffuse pollution. Although we cannot conclude that there is not an adverse effect on integrity such a specific issue needs mitigation at a local level. **Note – this issue has since been resolved at the local level. Investigations by the Highway's Agency, Natural England and Cannock District Council have shown that this specific concern, runoff from A5 and B4154 is not an issue and so this site is not considered further in this report.**
Pasturefields Salt Marsh SAC	This site is periodically affected by flood water from River Trent which has high sewage loadings and additional loadings from surface water runoff. This problem could be exacerbated by housing development upstream.	Housing development under policy CF3, which will result in the development 5,700 in Newcastle under Lyme, 10,100in Stafford (of which 7000 in Stafford Town) and 11,400 in Stoke on Trent.	The STWs upstream of the site have been identified as being at high risk (Strongford STW) and medium risk (Pirehill STW).	Water quality during flood events and its effects on the site is the subject of another appropriate assessment planned by the Environment Agency and Natural England (Terms of Reference yet to be agreed). This needs to be reviewed when that information is available.

European site	Water quality issues and risk to integrity	Effects of the plan	Trends and in combination effects	Effect on integrity
River Mease SAC	Existing water quality problems largely associated with agricultural run-off. However, screening identified there is also a need for improvements in SUDS and water treatment. Spined loach, Bullhead *Cottus gobio*, White-clawed crayfish rely on good water quality	An additional 8000 homes for Lichfield district although the majority are likely to go in the major town and will not be within 5 miles of the site.	No STW identified upstream of the River Mease which are at high or medium risk. There are settlements around the Mease smaller than 10,000 people which may discharge into this water course.	Decision dependent on understanding capacity and situation of local STW. However, if STW do not currently discharge into Mease it is unlikely that Phase Two will have an adverse effect on integrity as site is in rural location. Habitats Directive Review is currently being undertaken by the EA for this site and decision should be reviewed when the results are available
River Wye SAC	Qualifying Species such as White-clawed crayfish *Austropotamobius pallipes*, Sea lamprey *Petromyzon marinus* , Brook lamprey *Lampetra planeri*, River lamprey *Lampetra fluviatilis*, Twaite shad *Alosa fallax* and Atlantic salmon *Salmo salar* rely on good water quality. Water quality problems associated with sewage discharges cited as issue in screening workshops.	Phase Two plans for 16,600 additional homes in Herefordshire (including 8300 within Hereford City). The STW will have to deal with the additional wastewater.	Development of Ross and Leominster under the RES and Market Towns Initiative may affect run-off and increase sewage discharges to the Wye. The RES also identifies Herefordshire generally as an area for economic opportunity and the whole county falls within the Rural Regeneration Zone. Significant developments are possible, which may affect run-off into the Wye. Rotherwas STW at high risk. Moreton on Lugg STW at medium risk The pressure on water supply identified in section could have implications for water quality.	Adverse effects on integrity possible. The condition of the site is considered to be currently effected by sewage discharges, the existing STWs will have difficulties in accommodating additional growth and 16,600 additional homes are planned for Herefordshire. Habitats Directive Review is currently being undertaken by the EA for this site and decision should be reviewed when the results are available.
Severn Estuary cSAC	Qualifying Species such as Allis shad *Alosa alosa,* River	The Severn Corridor and tributaries flow through much of	Economic development in Worcester, Stourport, Bridgnorth, Telford, Shrewsbury, Ludlow and Kidderminster	Impossible to conclude there will not be an adverse affect due to the risks

European site	Water quality issues and risk to integrity	Effects of the plan	Trends and in combination effects	Effect on integrity
& Ramsar	lamprey *Lampetra fluviatilis* and Sea lamprey *Petromyzon marinus* immediately at risk if water quality deteriorates.	the region so the waters have the potential to be both positively and negatively affected by much of the development and regeneration proposed in Phase Two. For example; the River Stour is a tributary of the River Severn, so any additional sewage loadings in the Black Country resulting from the additional 61,200 homes planned will ultimately affect the Severn Estuary sites. But equally the surface water runoff improvements expected from the clean up of contaminated land will be beneficial.	could have an impact on runoff to the Severn. Both Worcester and Telford are identified as nodes for the High Technology Corridors and are therefore likely to be a focus for development. There are a large number of STW that ultimately feed in the Severn Estuary in the high risk category. Additional pressures on water supply could have implications for water quality. Major housing development in the South West could also put pressure on the system and require significant investment there to avoid additional sewage loadings on the lower reaches of the Severn.	identified in the EA technical paper Habitats Directive Review is currently being undertaken by the EA for these sites and decision should be reviewed when the results are available.
Severn Estuary SPA	SPA – Change in sediment levels, fresh/saline balance and pollution incidences may impact on invertebrates and therefore the qualifying bird species. Effect of increased nutrient levels on waders less clear - sewage outfalls may provide considerable supplies of food for bird species, either as directly edible matter or by artificially enhancing concentrations of invertebrate	The Severn Corridor and tributaries flow through much of the region so the waters have the potential to be both positively and negatively affected by much of the development and regeneration proposed in Phase Two. For example; the River Stour is a tributary of the River Severn, so any additional sewage loadings in the Black Country resulting from the additional 61,200	Economic development in Worcester, Stourport, Bridgnorth, Telford, Shrewsbury, Ludlow and Kidderminster could have an impact on runoff to the Severn. Both Worcester and Telford are identified as nodes for the High Technology Corridors and are therefore likely to be a focus for development. There are a large number of STWs that ultimately feed into the Severn Estuary which are in the high risk category. Additional pressures on water supply could have implications for water	Phase Two unlikely to affect integrity of site (alone or in combination). The plan is not considered likely to affect invertebrate communities or bird populations directly through changes in water quality. Habitats Directive Review is currently being undertaken by the EA for this site and decision should be reviewed when the results are available.

European site	Water quality issues and risk to integrity	Effects of the plan	Trends and in combination effects	Effect on integrity
	food through nutrient enrichment.	homes planned will ultimately affect the Severn Estuary sites. But equally the surface water runoff improvements expected from the clean up of contaminated land will be beneficial.	quality. Major development in housing in the South West could also put pressure on the system and require significant investment there to avoid additional sewage loadings on the lower reaches of the Severn.	
Midlands Meres and Mosses Phase I & II Ramsar site	Some sites affected by high levels of phosphate.	Largely associated with agricultural run-off and not directly affected by the Phase Two RSS.	NA.	Agricultural sources (e.g. of phosphate) may need to be addressed although this is not within the remit of the Phase Two RSS. Some may be liable to recreation effects. Needs to be considered in Phase Three HRA. **No water quantity or quality issues linked to Phase II Revision so this site was screened out and is not considered further in this study**

2.2 Recommendations to avoid adverse effects on integrity

2.2.1 Water resources

As it was not possible to conclude that the Water Companies would be able to meet the increased water demand associated with housing growth without adversely affecting the integrity of certain European sites, avoidance and mitigation measures were recommended as summarised in Table 2.

Table 3 Recommendations to avoid adverse impacts on the integrity of European Sites due to increased water demand

Phase Two HRA (2007) recommendations	Summary of supporting text or policies included in the RSS Phase Two Draft preferred option
'Development must be phased so that the water required to supply development can be provided from sources that would not have an adverse effect on European sites and that are confirmed as available prior to the development being approved'. 'When Water Resource Plans are available, **housing numbers in the RSS must be conditional on these demonstrating that the numbers are achievable without prejudice to the integrity of European sites across the region. Policy CF4 on phasing should be amended to set out these possible constraints'.** **'In cases where increased demand is shown to carry a risk to European sites, 'water neutrality' of development will be required'.** **'Meanwhile all new development must incorporate water conservation and efficiency measures in line with Policy SR3 of the RSS and the retrofitting of sustainable drainage systems and water efficiency measures must be encouraged within existing developments'.**	2.28 – LAs will need to engage with the EA and Water companies to ensure water resources will be available to meet demands of new housing, and to ensure the necessary improvements to the water distribution infrastructure are provided. Working towards water neutrality by utilising the highest practicable water efficiency measures will help reduce pressure on resources and minimise impacts on European and national conservation sites. 2.29 – reducing the volume of water from both new and existing buildings by water efficiency measures, will help to reduce demand on existing infrastructure. LAs will need to working with EA and water companies to develop water cycle studies to inform their LDDs. SR3 – G – Requiring all new homes to meet or exceed the water conservation standards in Level 4 of the Code for Sustainable homes, that offices meet the BREEAM office scale and that other buildings achieve efficiency savings of at least 25%. SR3 – I – Promoting and seeking opportunities to introduce similar energy and water efficiency standards and sustainable drainage systems in existing buildings. 6.35 – also refers to water cycle studies and phasing of housing development.

The changes made a substantive contribution to reducing additional demand, but the recommendation to phase development in relation to assured water supply from sources that would not adversely affect a European site was not included.

2.2.2 Water quality

The Phase Two HRA 2007 concluded that policy QE9 already provided some of the mitigation needed, but some additional measures were suggested (Table 4).

Table 4 Recommendations to avoid adverse effects on integrity of European Sites due to changes in water quality

Phase Two HRA (2007) Recommendations	Summary of supporting text or policies included in the RSS Phase Two Draft preferred option
In relation to sewage discharges:-	
Suggested measures to avoid impacts tie in with many of the recommendations from the EA technical study. To avoid impacts on European sites the following are needed:	
a) a new policy requiring Local Authorities to engage in early consultation with Water Companies and the Environment Agency on site allocations for significant developments to ensure sewerage infrastructure is considered early in the plan process	2.28 – LAs will need to engage with the EA and Water companies to ensure sewerage infrastructure will be available to meet demands of new housing – minimise impacts on European and national conservation sites.
b) a new policy in the water section requiring Local Authorities to carry out water cycle studies where appropriate to inform the LDD. Alternatively this could be achieved by altering policy QE9 to include wording to this effect.	2.29 - LAs will need to work with the EA and water companies to develop water cycle studies to inform their LDDs. The use of sustainable drainage systems will be essential to reduce any adverse effect from development on the water environment and especially European sites. LAs will need to working with EA and water companies to develop water cycle studies to inform their LDDs.
c. Ensure that the implementation plan links up the delivery of housing with the capacity of the STW and sewage network and planned improvements to these so that quality of effluent discharged would not be compromised. This should be included in RIP phasing.	
Policy CF4 should be amended to take account of constraints on the phasing of housing delivery to ensure that required water treatments infrastructure is in place	
In relation to urban surface water runoff:-	
In modern developments clean surface water is often directed into nearby rivers through a separate sewerage system. This has the advantage of reducing the volume of clean water going for treatment, but if pollution from surface runoff gets into these drains it is sent quickly and untreated into the rivers. Surface water runoff and subsequent pollution may occur wherever further development, hard surfaces and surface water drains are added along the river corridors and tributaries.	
In order to conclude that further development will not adversely affect European sites, current references to use of SUDS should be tightened so they are more commonly implemented on the ground**. Policy CF3 should be amended to indicate that housing numbers will be dependent on**	SR3 – H – Requiring the use of sustainable drainage systems and integrated surface

demonstrating no adverse effect from runoff. Policies SR3 and QE9 should be amended from "encouraging consideration of their use" to "using SUDS to reduce any adverse effects on the water environment and especially designated conservation sites". The Code for Sustainable Homes includes measures related to surface water runoff which are intended to ensure that 'peak run-off rates and annual volumes of run-off post development will be no greater than the previous conditions for the site'. All developments are required to achieve CSH standards for water and energy and **achieving the standard for runoff should also be included as a requirement.**	water management in all medium and large developments, unless it can be demonstrated that it is not practicable to do so. SR3 – I – Promoting and seeking opportunities to introduce similar energy and water efficiency standards and sustainable drainage systems in existing buildings. 6.26 – LA in their LDDs and in response to planning applications should require sustainable drainage systems as set out in policy SR3. 6.35 – also refers to water cycle studies and phasing of housing development.

Many of the mitigation recommendations were taken into account and are already included in the RSS Phase Two Draft preferred option. An important omission is the emphasis on the phasing of housing delivery to ensure that required water treatment infrastructure is in place and the suggestion that Policy CF3 should be amended to indicate that housing numbers would be dependent on demonstrating no adverse effect from surface runoff.

3 Review of Draft Water Resources Management Plans

Water companies in England and Wales publish WRMPs to set out how they intend to provide a secure and sustainable water supply for the next 25 years. Water is supplied to the West Midlands Region by Severn Trent Water, South Staffordshire Water and Welsh Water. The draft WMRPs are examined below.

3.1 Severn-Trent Water's dWMRP & statement of response

3.1.1 Introduction

Severn Trent Water divides its supply area in to 6 Resource Zones (WRZs) as illustrated in Figure 1. These are:

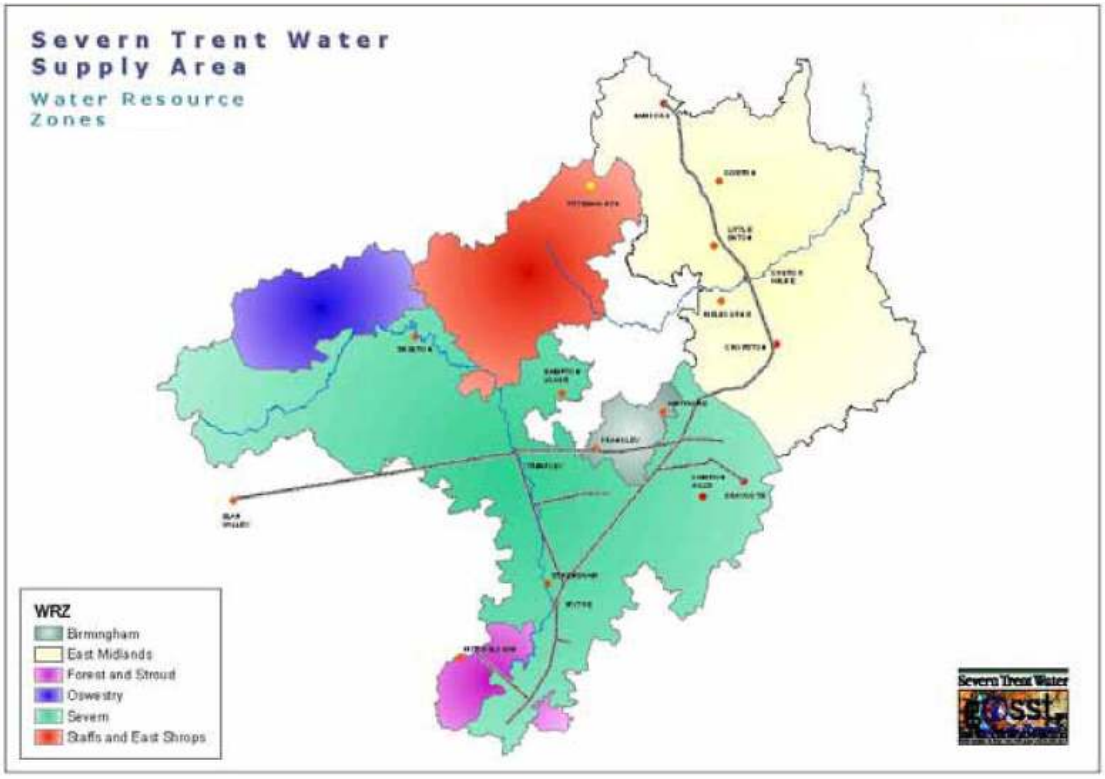

Figure 1 Water resource zones within the Severn Trent Water region[5]

European sites that may be affected by Severn Trent Water's use of water within these zones are set out in Table 5.

[5] Sourced from Severn Trent Water's water resources management plan 2009 draft version, May 2008, volume 1 – main document

Table 5 European sites that may be affected by water abstraction within each zone.

WRZ	European site	Link & possible risk
Oswestry (WRZ1)	River Dee and Bala Lake SAC The Dee Estuary Ramsar Site, SPA, cSAC	The Mardy area groundwater resources, which are over abstracted, are linked to a tributary of the River Dee. This may be a contributory factor in low flows along with four other groundwater sources located in Cheshire[6].
Staffs and East Shropshire (WRZ2)	Cannock Chase SAC, Pasturefields Salt Marsh SAC, West Midland Mosses SAC	Water resource issues are mainly related to groundwater: there are over-abstracted and over-licensed aquifers around Stoke, Stafford, Leek, and Telford. Recent RoC have shown that sustainability reductions are needed in aquifers around Cannock Chase, and there is no adverse impacts on integrity from abstractions at Pasturefields Saltmarsh SAC and West Midlands Mosses SAC
Severn (WRZ3)	River Wye SAC and Severn Estuary SAC, SPA and Ramsar	The River Severn is a major source of water for the region. There are currently five major abstraction points. Increased abstraction at Ombersley was proposed in the dWRMP but this option has now been removed through the Statement of response.
Birmingham (WRZ4	River Wye SAC and Severn Estuary SAC, SPA and Ramsar	Water resources issues include the use of the River Severn at Trimpley to supplement flows in the Aqueduct. Main supply is from the Elan Valleys.
Forest and Stroud (WR5)	River Wye SAC.	The main potential water resources issue is the Wye abstraction at the Mitcheldean Water Treatment Works (WTW). – However, Severn Trent Water has no plans to increase abstraction from this.
East Midlands (WR6)	Peak District Moors SAC, the Peak District Dales and the River Mease	The only European site where concerns have been raised in relation to water abstraction is the River Mease SAC which has gone through to RoC Stage 4 for water supply and water quality issues.

3.1.2 Assessment of supply and demand

The dWRMP incorporates the housing growth rates set out in the Regional Spatial Strategies (RSS) for the West Midlands and East Midlands. In addition the plan considers the impacts of the designated housing "Growth Point" councils in and around the West Midlands region. It does not incorporate the NLP study scenarios or the final proposed housing numbers for the East Midlands RSS, but Severn Trent Water has stated that the numbers put forward in the NLP study will not have a material impact on dWMRP as it stands[7]. This statement was repeated at the SEA meeting following the production of the Statement of response and in addition Severn Trent Water confirmed that the housing in the NLP scenarios would not have an influence on the AMP period in which options were delivered[8].

[6] Severn Trent Water (2008) Water Resource Management Plan SEA Report

[7] STW (2009) Water Issues Meeting. 26th January 2009

[8] Natural England (2009) Pers Comm. Feedback from SEA meeting with STW on 24th February 2009

The Statement of Response revisits the water demand forecasts. Key points include:

- Severn Trent Water is now projecting that Per Capita Consumption (PCC) can be reduced to 133 litres/ head/ day by 2035 as apposed to the 138 litres/head/ day under the baseline scenario;
- the revised strategy predicts that 72% of billed household with be metered by 2035 instead of 70%
- The economic slowdown has been taken into account in the short term but STW has assumed the rates of properties constructed by 2035 will reach those set out in the RSS
- There has been an extreme decline in water use by the commercial sector with the recent economic slowdown. Severn Trent Water is projecting this to continue into 2009/10 and for the impacts to be felt throughout AMP5. In the longer term STW have made the assumption that commercial water consumption will eventually return to more normal trends.
- The revised AMP target is to reduce leakage to 453Ml/d by 2014-15, as compared to a target of 476Ml/d in the draft plan.

The short term reduction in demand noted in the recently published Statement of response and the additional focus on water efficiency, reducing leakage and increasing metering has allowed Severn Trent Water to reconsider the options for the final WRMP. More detail is given in section 3.1.3

Severn Trent Water is confident that the final plan will achieve and maintain the target headroom for the period of the RSS[9].

3.1.3 Options taken forward

The following scheme options were originally presented in the dWRMP as potentially providing new sources of water past 2015:

- Uckington Export to Telford
- River Trent Church Wilne extension
- Notts Groundwater
- Ombersley
- Beckbury groundwater

Of these options, two were of concern to both NE and EA. In the East Midlands, the River Trent Church Wilne extension (option 88) had the potential to affect the Humber Estuary SAC/SPA/Ramsar[10]. The Ombersley scheme 108 would rely on additional flow augmentation to the River Severn during dry periods to minimise/avoid adverse environmental effects (in particular the Severn Estuary SPA, SAC and Ramsar Site)[11]. In addition, the Severn Trent dWMRP SEA stated that existing abstraction in these areas may be causing unacceptable environmental damage in terms of the integrity of designated nature conservation sites and that further investigations would be required prior to implementation. However, the

[9] Natural England (2009) Pers Comm. Feedback from SEA meeting with STW on 24th February 2009

[10] Natural England's Response to Severn Trent Water's Water Resource Management Plan 2009- Draft Version May 2008

[11] Concern raised by Natural England and Environment Agency during water issues meeting on 26th January 2009.

recently published Statement of Response has removed these two schemes from consideration within the final WRMP[12].

The supply schemes selected for inclusion in the Final WRMP are listed below in relation to the WRZ within which they are located.

WRZ3: Severn

- 75: Prescribed Flow Review (River Leam)
- 76 Norton Aquifer Storage Recovery (ASR)
- 150: Edgbaston Borehole
- 151: Highters Heath ASR (will benefit more than one WRZ, also listed in the Birmingham WRZ)
- 154: Minworth ASR (will benefit more than one WRZ, also listed in the Birmingham WRZ)
- 157 Whitacre ASR

WRZ4: Birmingham

- 151: Highters Heath ASR (will benefit more than one WRZ)
- 154: Minworth ASR (will benefit more than one WRZ)

WRZ6: East Midlands

- 153 Milton Borehole Trent Transfer

None of these supply options have been identified as being of concern for the European sites listed in Table 5.

With regard to the Prescribed Flow Review on the River Leam, this specific scheme proposes a permanent reduction in the prescribed flow on the River Leam from 18.2 Ml/d to 12.2 Ml/d, which results in a potential source deployable output gain of 6 Ml/d. Although any surface water abstraction measures will have some effects on riverine environments, the Draft Final SEA of the WRMP concludes as follows concerning potential related environmental impacts:

> "*results from an assessment conducted by Hyder Consulting in 2007 for the River Leam and Upper Avon Drought Permit Impact Assessment suggest that a reduction in the prescribed flow in the River Leam from 18.18Ml/d to 12Ml/d represents a reduction in water levels of between 3cm and 5cm. The report provides an extensive review of the effects on invertebrates, fisheries, macrophytes, water quality etc. It concludes that the reduction in the prescribed flow is unlikely to have detrimental effects on marginal plants and/or the visual aesthetic value of this area, as the decrease in wetted perimeter translates into a reduction* ***of less than 1%.*** *In addition, recent data show that water quality in the River Leam has improved, possibly as a result of alterations to STWs".*

Taking into account the fact that this scheme will not affect weekly output, and all infrastructures already exists for delivery of this scheme, it is very unlikely to have a significant impact on levels and quality on the River Avon, or ultimately to affect the Severn Estuary European sites.

The ASR schemes aim to use the storage of surplus water during low demand periods or over winter periods and so shouldn't lead to adverse environmental

[12] the Statement of Response to comments on Severn Trent Water's draft Water Resources Management Plan http://www.stwater.co.uk/server.php?show=nav.6186

impacts in their operation. Any particular construction issues will need to be considered under the requirements of the Conservation (Natural Habitats & c.) Regulations 1994 (as amended), although no particular issues have been identified.

Highters Heath, Minworth ASR would seek to reduce pressure on the Severn WRZ. The focus of the Edgbaston Borehole is reduced reliance on Frankley WTW, which could result in more deployable water from Frankley into the Severn WRZ. The additional resources to the Severn WRZ brought about by this scheme may mean that existing abstractions from sources experiencing environmental pressures may be reduced.

The Final Draft SEA states that:

> "*overall it can be concluded from the results of the assessments of the revised list of schemes, that cumulatively, the implementation of the proposed WRMP schemes will have significant positive effects on the environment*".

The possible adverse effects referred to relate to infrastructure works associated with the schemes, which are not yet defined. However these schemes are not located in close proximity to European sites, so the localised disturbance and damage often related to construction is unlikely to have a significant adverse effect. Changes to sedimentation or flow during construction would have to be extreme, be the result of an accident or represent terrible practice to affect the Severn Estuary sites. In addition, as the projects come forward and details on implementation and delivery are provided, there will still be a requirement to assess these projects under the Habitats Regulations.

At this level, and with the detail available, none of these supply options have been identified as being of concern for European sites.

3.1.4 Risk and uncertainties

The majority of RoC investigations have not yet progressed to a stage where an indicative or definitive sustainability reduction can be defined. Severn Trent Water has committed to working with the Environment Agency to progress the investigations and to have as much information as possible available for the final plan. In addition, for the final plan, Severn Trent Water has removed any new water resource investment options that could impact on the Restoring Sustainable Abstraction (RSA) sites which are under investigation. Severn Trent Water has committed to undertaking sensitivity testing to demonstrate the full impact of future RSA reductions. The results of the sensitivity analysis will be summarised in the FWRMP (although they will not affect the strategy) and shared with the EA and NE when available. Although they won't affect the strategy, they will hopefully serve to support Severn Trent Water's predictions that the FWRMP won't adversely affect European sites. The results will also inform the next revision of the WRMP before schemes are taken forward that may lead to adverse effects.

In the draft plan, there were originally some years within the forecast AMP periods when the target headroom was not achieved, but this has also been addressed in the Statement of Response. Severn Trent Water states that:

> "*the leakage, metering, water efficiency and water resource investments set out in our final plan are based on the cost of achieving and maintaining target headroom throughout all the years".*

3.1.5 Severn Trent dWRMP SEA

The Draft SEA of the dWRMP has been updated and comments from this document included in the section above. The conclusion from the Strategic Environmental Assessment (SEA) is that the STWL WRMP overall will be able to secure future

water supplies across the region with minimal effects on the environment. The Strategic Environmental Assessment process and environment report must have regard environmental problems that may affect areas designated pursuant to Directives 79/409/EEC and 92/43/EEC[13]. The report only refers to possible negative effects on these areas from construction of associated infrastructure which will be considered at the project level under the requirements of the Conservation (Natural Habitats & c.) Regulations 1994. Future lack of water availability or deterioration of water quality at European sites is not predicted to be a significant problem.

3.1.6 Key Points for European sites

The majority of investigations have not yet progressed to a stage where an indicative or definitive sustainability reduction can be defined. Following discussions and advice from Natural England at the meeting on the 26th January 2009, Severn Trent Water has decided to undertake a Habitats Directive Assessment of the dWRMP[14]. The results of the screening stage are not available and so cannot be used to inform this assessment.

Without the results from the RoC, the RSA sensitivity analysis and the HRA results, we are unable to say with complete certainty that the WRMP will not have an adverse effect on European sites, in particular the Severn Estuary SAC, SPA and Ramsar. However, taking into account the fact that an assessment at this level does not remove the requirement to consider the need for HRA at the project level the following evidence provides confidence that the FWRMP can be deemed not to have an adverse effect on European sites:

- the dWRMP has been amended with a greater focus on water efficiency, reducing leakage and promoting metering;
- the schemes that were identified as possibly having a likely significant effect on European sites have been removed through the Statement of response;
- alternative schemes do not lead to further abstractions from sources where there are likely to be sustainability reductions. In particular the Statement of response does not identify any schemes that will require an increase in their abstraction licences from the River Severn, River Wye or a change to the Elan system regime;
- Severn Trent Water has stated that there are no plans to increase abstraction from the Elan Valley System or the Mitcheldean Abstraction point on the Wye;
- Severn Trent Water has stated that the increase in housing numbers proposed through the NLP scenarios wont have a material impact upon the FWRMP and that the headroom is available for uncertainty.
- the WFD/RSA Sensitivity Analysis will be available for the statutory nature conservation bodies before the publication of the FWRMP to provide evidence that headroom is available to accommodate the sustainability reductions and without drawing on other sources that may have a likely significant effect on European sites.

[13] Directive 2001/42/EC of The European Parliament and of The Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment. Annex 1(d)

[14] Jim Davies, Environment Agency (11th March 2009) pers Comm

3.2 South Staffordshire Water WRMP and statement of response

3.2.1 Assessment of supply and demand

South Staffordshire Water has made clear within the dWRMP and the Statement of Response, that it is confident that the supply-demand balance will remain in surplus throughout the 25 year planning period. In addition the company is able to move water around the whole area of supply due to a high degree of system integration. This provides a lot of flexibility and means that all South Staffordshire's customers are subject to the same level of service for restrictions.

3.2.2 Options taken forward

The Statement of response sets out that the options presented in the DWRMP will not be required, but were included only as part of a sensitivity analysis. The Company has a surplus of supply over demand throughout the planning period, and does not plan to implement any of these schemes in the FWRMP.

3.2.3 Risk and uncertainties

The Company is confident that the supply demand balance will remain in surplus throughout the 25 year planning period and this was reflected in their presentation to the technical panel on the 18th March 2009.

3.2.4 WRMP SEA & HRA

No HRA has been carried out on the WRMP.

Natural England did not agree with the methodology used to screen options, and wanted to see a greater integration of the Strategic Environmental Assessment with the plan. However as the options presented in the DWRMP will not be required, but were included only as part of sensitivity analysis, South Staffordshire Water has made it clear that that there will be no further work on these options for the FWRMP.

3.2.5 Key Points for European sites

The River Mease could potentially be affected by water abstraction at Chilcote, and concerns were raised that abstraction of the full annual average licensed quantities could have a detrimental impact[15]. Despite the fact that the RoC has not been finalised, the EA has identified an indicative licence reduction of 1 Ml/d to protect river flows and ecology and this has been included in the Draft Water Resources Management Plan. This has not been challenged or amended through the Statement of Response.

South Staffordshire Water sent the following statement via email:

> "*We can confirm that we have included the additional (Nathanial Lichfield) housing growth assumptions in our Final Water Resources Plan demand forecast. And I can say with some confidence that we will still continue to show a surplus of supply over demand for the entire 25 year planning horizon. As a result there can be no impact on Habitats Sites due to additional water abstraction resulting from our plan".*[16]

[15] South Staffordshire draft Water Resources Management Plan March 2008

[16] South Staffs Water (26th January 2009). Email to Natural England following absence at the water issues meeting in Solihull.

3.3 Welsh Water WRMP

There are twenty-four water resource zones defined across Wales as shown in Figure 2.

Figure 2 Water Resource Zones in Wales[17]

3.3.1 Supply - demand balance

The baseline supply-demand balance has been appraised at all twenty-four water resource zones for the annual average condition. Overall at the Welsh Water company level there is a robust water resources position within Wales. However there are a number of deficit zones that have been identified by the end of 2014/15.

[17] Welsh Water Draft Water Resources Management Plan, March 2008

The dWRMP identifies those with an Annual Average Supply-Demand Deficit. These include NEYM, Clwyd, Alwen – Dee, Bala, Tywyn Aberdyfi and South Meirionydd

Those in Critical Period Supply-Demand Deficit (Ml/d) include NEYM, Clwyd, Tywyn Aberdyfi and Vowchurch.

These zones will require investment during AMP5 to address the deficit. Options to deal with deficits in supply-balance are discussed in section 3.3.2.

On the 10th February 2009 a conference call between Welsh Water, Environment Agency Wales, West Midlands Regional Assembly, Welsh Assembly Government and Government Office West Midlands confirmed the situation with regard to supply and the predicted demand from housing growth in Herefordshire. WW confirmed that the dWRMP is based on the housing figures set out in the NLP study (890 homes/yr)[18]. Welsh Water confirmed that there would be enough water to supply the existing customers and the growth in Herefordshire as a whole without adversely affecting European sites.

Under the Review of Consents process undertaken by the Agency proposals have been identified at Pilleth. 1.6 Ml/d reduction is likely to be required at Pilleth and this represents a large proportion of the total abstraction (3 Ml/d). This is not mentioned in the dWRMP as sustainability reductions had not been identified at the time of submission.

For Pilleth, initial options discussed include bank side storage or a long transfer from the Wye. A bank side storage scheme at Pilleth is the preferred option as it can be used as a winter refill option, within the Habitat Directive Ecological River Flow, with no impacts on the SAC. However, it is recognised that if this preferred option is not viable, then the only remaining option would be a lengthy transfer which would impact the Wye SAC.

Only a small part of the Pilleth WRZ lies within Herefordshire and within the regional boundary so it is not considered by Welsh Water to be a significant issue for the level of growth proposed in West Midlands RSS Phase 2 but this locational issue needs to be considered in the allocation of housing through the LDF process.

Welsh Water confirmed that growth can be accommodated within other water resource zones in Herefordshire. Seasonal reductions will be required at Broomy Hill which supplies 4 WRZs, but there is headroom within the licence to accommodate the sustainability reductions required without affecting current abstractions and without affecting planned growth under the RSS Phase 2 and the NLP scenarios.

The full notes from the meeting with Welsh Water are available in Appendix A.

3.3.2 Options taken forward

Zone Name	Option Name
Clwyd Coastal	Leakage Option
Bala	Leakage Option
Tywyn - Aberdyfi	New Groundwater abstraction to feed Penybont
South Meirionydd	Leakage Option
Vowchurch	Upsize trunk main from Hereford CUS

[18] Welsh Water (2009) added as corrections to the draft report on 12th March 2009

Vowchurch WRZ requires an option where resource and production management is needed. The dWRMP SEA[19] indicates that there are no significant effects associated with upsizing the upsize trunk main from Hereford CUS. In addition the dWRMP SEA states that:

> "*In the long term, it has been determined that this option will not have significant negative environmental effect. However, it should be noted that replacement of the main in order to upsize will give rise to disruption during construction. Project level environmental assessment will be required to ensure that any likely negative effects are minimised*"
>
> "*Although the option requires increased abstraction from the River Wye SAC, the volumes are very small and are included within the existing abstraction licence evaluated within the existing assessments under Review of Consents". However if large reductions in abstractions from the River Wye are needed this would affect the ability to deliver this option*".

The HRA[20] states that the solution for Vowchurch WRZ may need to be revised following the RoC if sustainability reductions are proposed for this licence. This is not likely as subsequent to the HRA completion the EA has issued the National Environment programme in November 2008 which indicates no sustainability reductions in upper Wye[21].

3.3.3 Risk and uncertainties

- EAW are currently at Stage 4 of the Habitats Directive RoC process for the Wye and Usk SACs. Extensive Modelling has been undertaken and indications are that licence amendments may be needed that would result in a loss of deployable output of around 130Ml/d. This represents a major loss of yield within South-East Wales but within Herefordshire only the Pilleth WRZ is affected.
- The Review of Consents process has also identified the risk of entrainment or impingement of SAC species at a number of sites including on the Rivers Usk and River Wye. Welsh Water has stated that the criteria set by the EAW for screening to avoid risk to the Shad are very stringent and that these criteria pose a significant risk to the continued operation of Rhayader (Usk), Monmouth (Wye) and Manorafon (Tywi) abstractions in their current configuration.
- CCW has concerns about adverse effects on the River Usk SAC. In discussions regarding the transfer of water from the Wye to the Usk, CCW indicated that they required a "*robust assurance/degree of certainty that there will be no adverse effects on European sites[22]".* In response, EAW and Welsh Water have both stated that: due to the position of the transfer (on the lower reaches of the Wye below Monmouth); the fact that the licences are worked out and based on fully licensed abstractions; and that the Wye transfer transfers to a Welsh Water asset, it does not contribute towards flow in the river[23]; that that the abstraction for the transfer will not be affected by housing growth in Herefordshire.

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[19] Hyder (February 2008) Welsh Water, Water Resources Management Plan Strategic Environmental Assessment, Environmental Report

[20] Welsh Water HRA (23rd January 2009)

[21] Welsh Water (2009) added as corrections to the draft report on 12th March 2009

[22] CCW (25th February 2009) Conference Call notes as amended by CCW

[23] Welsh Water (2009) added as corrections to the draft report on 12th March 2009

3.3.4 Welsh Water SEA and HRA

Welsh Water has carried out HRA of the dWRMP on the advice of CCW.

The HRA indicates that 24 SACs and SPAs are potentially affected by the currently consented abstraction regime. However, whether these abstraction consents have significant or adverse effects alone or in combination with other consents can only be accurately quantified through the RoC process. Of particular note for the West Midlands RSS Phase Two Revision is that the assessment concludes that it is not possible to be certain that the preferred solutions for "Vowchurch WRZ, will have not have a significant effect on any European site when implemented, since the details required to establish this (i.e. scheme parameters) are not available at this stage"[24]. However, the HRA states that there are alternatives options on the constrained list that are practicable, have no apparent LSE on any European sites and which could be utilised if the preferred options are unacceptable at the project level. These alternative options are:

- Licence Variation at Vowchurch for Peak Week.
- Pumped storage reservoir adjacent to the River Dore (winter fill).
- New groundwater abstraction from same aquifer.

Although the National Environment programme in November 2008 clearly indicates no sustainability reductions in upper Wye[25], the HRA has recommended a caveat - based approach to ensure that individual schemes are appropriately assessed at a lower level of planning[26].

3.3.5 Key Points for European sites

- "Environment Agency Wales (EAW) is currently at Stage 4 of the RoC Process for the Wye and Usk SACs. This means that at Stage 3, it was not possible to conclude that abstraction licences would not to have an adverse effect on the integrity of these sites if used to the fully licensed limit. Stage 4 will identify the changes needed to the current abstraction licences.
- EAW has not finalised the sustainability reductions under the Habitats Directive for inclusion within the draft Plan" (dWRMP, March 08). Also a RSA site sensitivity analysis has not yet been produced by Welsh Water to demonstrate that the reductions can be accommodated without schemes that might have an adverse effect on European sites. However, in correspondence, Welsh Water has expressed confidence that, even if large reductions in abstractions from the River Wye are needed, this won't affect ability to deliver the options proposed or to supply water for the growth proposed in the RSS.
- CCW still has concerns about the ability of Welsh Water to accommodate the sustainability reductions and requires absolute certainty that there would be no adverse effects on European sites.

Without the final results from the RoC or the RSA site sensitivity analysis we are unable to say with complete certainty that the FWRMP will not have an adverse effect on European sites, particularly the River Wye SAC. However, this is not the purpose of this study. The question is whether the West Midlands RSS will have an

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[24] Welsh Water Water Resources Management Plan Draft Habitats Regulations Assessment 23rd January 2009

[25] Welsh Water (2009) added as corrections to the draft report on 12th March 2009

[26] Welsh Water HRA (23rd January 2009)

adverse effect alone or in-combination on European sites. Taking into account the fact that an assessment at this level does not remove the requirement to undertake Habitats Regulations Assessment at the project level, it has been possible to conclude that the current planned level of housing growth proposed in Herefordshire through the RSS can be deemed not to have an adverse effect on European sites, for the following reasons:

- Neither Welsh Water, nor the Environment Agency in Wales, has raised any objections to the housing numbers being proposed through the RSS. As the Environment Agency is responsible for managing water resources in England and Wales[27] and undertaking the Review of Consents process, their opinion is of primary importance.
- Welsh Water, EAW and CCW have all agreed that the biggest challenge is accommodation of sustainability reductions required through the RoC process[28]. Welsh Water and EAW have confirmed that growth in additional demand from households is not a significant issue compared to the magnitude of change required by the sustainability reductions.
- Sufficient headroom is available within all zones apart from Pilleth. Here, some of the possible options for delivering the licence reductions required under the Habitats Regulations may have an adverse affect on European sites. This issue is a specific locational issue and does not need to be exacerbated by the total quantum of growth in Herefordshire. Only a small part of the Pilleth WRZ lies within the West Midlands Region and growth can be avoided here until any local issues of water supply are appropriately dealt with.
- An HRA has been carried out on the dWRMP and an update to this assessment will be undertaken of the final plan. This update will have to assess the options which are developed for Pilleth for inclusion in the FWRMP. The HRA will need to conclude whether issues affecting this WRZ can be addressed without an adverse effect on the European sites. The potentially costly solutions will have to be resolved by Welsh Water in cooperation with EAW and the outcome should guide the allocation of development sites in the LDF process.

Nonetheless due to the lack of absolute certainty, we recommend the following precautionary approach, including:

- adoption of a suitable mitigation policy in the RSS to ensure that water supply problems in Herefordshire are tackled in the Herefordshire LDF; and
- consultation with Welsh Water and the EAW (this is a statutory requirement) before development is allocated or permitted in any WRZ. This is essential because if additional spatial growth occurs in any water resource zone above proportioned growth then it may be enough to change current supply/demand balances.

[27] EA website (2009) http://www.environment-agency.gov.uk/research/planning/33372.aspx

[28] See meeting notes in Appendix A

4 Environment Agency reports and information

4.1 The Environment Agency August Update 2008

The EA study[29] was based on the 2004 data rather than the 2008 dWRMP data, so the assessment and conclusions are now effectively out of date. The EA is planning to update the assessment of supply/demand balance for each of the plans but this was not available in time for inclusion in this report.

4.2 Environment Agency comments on the NLP study December 2008

The EA provided comments to Government Office in a ten page paper on the proposed housing options and the scenarios considered in the Nathaniel Lichfield & Partners Study[30]. These comments reflected on the information provided within the Study and associated SA, and the implications of the proposed options and scenarios on flood risk, water resources, water quality, biodiversity, and waste. The following text attempts to summarise the relevant points from this paper.

4.2.1 Water Resources

The EA did not consider that the increase in housing numbers suggested in the NLP study would present an issue for the supply of water by the Water Companies at the Water Resource Zone level. Importantly the paper states that:

> "*Both STW and South Staffordshire Water have identified in their dWRMPs what would be required to supply the RSS growth with potable water and that the extra growth identified in the NLP study does not equate to a large increase in demand at Water Resource zone scale".*

Although there may be no potential showstoppers at the WRZ level, there may be issues to be addressed at the local level. The upgrading of the existing water supply infrastructure will have cost and time implications and may affect the timing of specific developments. Once particular sites have been identified there must be consultation with the Water Companies to assess possible implications and to agree the phasing of development.

The EA suggests some additional caution with regard to the River Severn Water Resource Zone which is currently the most stressed WRZ in the region. The EA did not present any conclusions with regard to Welsh Water as, at the time of the comment, Welsh Water had not published their draft WRMP. However, the need for caution was suggested with regard to the large sustainability reduction needed to protect the River Wye SAC.

4.2.2 Water Quality

In the Sustainability Appraisal of the NLP study, waste water treatment is listed as a key infrastructure challenge in many authorities. Based on the difference between measured and consented flows at sewage discharges located in each of the areas of growth the Agency could foresee possible capacity issues for the three suggested growth options in the following areas:

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[29] Environment Agency (2009) Pers comm. Email received on 24th February

[30] Environment Agency (2008) (note incorrectly named 2009) Nathaniel Lichfield & Partners Study – Comments from the Environment Agency

The Black Country, Solihull, Bromsgrove, Nuneaton and Bedworth, Stratford-on-Avon, Lichfield, Market Drayton, Droitwich, Oswestry, Coventry, South Staffordshire, Warwick, Worcester, Rugby and Telford and Wrekin. However, this is slightly confusing as the NLP scenarios do not propose additional growth in the Black Country, Nuneaton and Bedworth, Lichfield, Coventry or South Staffordshire. We have to assume that the capacity issues identified relate to growth as originally proposed through the RSS Phase Two Revision Preferred Option.

The Environment Agency's paper provides comments with regard to sewage treatment works serving Bromsgrove, Coventry, Lichfield, Solihull, Bedworth and the Black Country and states that these STWs already discharge to controlled waters that offer little dilution. It goes on to say that these could potentially be subject to tight consent limits, given the projected growth suggested in the study and that the treatment works could be subject to tight consent limits which they may be unable to achieve without significant improvement measures being employed. The Agency states

> "*It will be necessary to phase development in line with the implementation of appropriate waste water treatment infrastructure"* and that *"it would be inappropriate to allow development to commence in areas where there is insufficient dilution within receiving waters capable of accepting additional treated discharge from waste water treatment plants".*

Given that of these areas the NLP study only proposes additional growth within Bromsgrove and Solihull, we assume that 'phasing' is already necessary for the growth proposed under the RSS Phase Two Revision Preferred Option.

An increase in run-off of rainwater into existing combined sewerage systems producing an increase in flow into the sewerage systems is also cited as a problem exacerbated by the increase in housing and area of hard ground under the original RSS levels and by combining the NLP suggestions. There is a repeated call for communication and cooperation at the local level. Local authorities will need to produce Water Cycle Strategies which include Surface Water Management Plans in to order to plan developments which will not increase surface water and sewerage flooding events.

The EA commented that

> *"Given the lack of information regarding location of housing development we cannot identify any showstoppers to the suggested growth scenarios with regard to water quality"* but include a caveat that they *"will reserve the right to object to any development proposals which if permitted would adversely effect the environment or conflict with the requirements of the Water Framework Directive ".*

4.2.3 Recommendations

The report states that:

> "*growing communities are putting services under pressure and in many places the infrastructure and the environment it supports is reaching a tipping point".*

It requests that, if preferred sites for development are not identified in the RSS, the necessary environmental checks should be implemented at a subsequent stage to ensure that inappropriate development does not take place.

The EA report recommends that *inter alia* the following should be taken into account in the selection of a preferred option sites:

- *Development should be flood resilient and allowances included to accommodate climate change.*

- *Complete avoidance of high flood risk zones.*
- *Use of SUDS and Surface Water Management Plans.*
- *Use of Water Cycle Strategies.*
- *Phased development is used to ensure, for example, that appropriate drainage measures are installed and implemented before development is occupied.*
- *The potential impacts to water deficit areas are considered.*
- *Organisations in neighbouring regions are consulted such as Welsh Water and Countryside Council for Wales concerning potential impacts on the natural habitats and ecosystems that rely upon the River Wye and Severn.*

4.3 Review of Consents

The Review of consents programme involves the review of the Environment Agency's exiting authorisations, consents, licences and permissions affecting all 273 Special Protection Area (SPAs) and Special Areas of Conservation (SACs) in England and Wales. The Environment Agency aims to complete the review of all sites by March 2010[31]. Table 6 summarises the outcomes of the RoC process for the European sites considered during the Phase Two HRA.

Table 6 Summary of stages and conclusions reached in the RoC process[32]

European site	Outcome of RoC or Stage that EA have reached in the RoC process
Bredon Hill SAC	Concluded No LSE
Brown Moss SAC	Concluded No AEOI
Cannock Chase SAC	Gone through to stage 4 for WR, currently stage 4 being undertaken.
Cannock Extension canal SAC	Concluded No AEOI
Dixton woods SAC	Concluded No LSE
Downton Gorge SAC	Concluded No LSE
Ensor's Pool SAC	Concluded No LSE
Fenns & Whixall SAC	Concluded No AEOI
Fen's Pools SAC	Concluded No AEOI
Humber Estuary SCI	All licences were affirmed (finding No AEOI) except for 7 which required changes for either entrainment of lamprey or toxic contamination. No impact upon Severn Trent Water[33]

[31] Environment Agency website. Habitats Directive Review of Consents (sourced on 3rd March 2009) http://www.environment-agency.gov.uk/business/regulation/31915.aspx

[32] Information prNatural England) on the 27th January 2009

Lyppard Grange Ponds SAC	Concluded No LSE
Mottey meadows SAC	Concluded No AEOI
Pasturefield saltmarsh SAC	Concluded No AEOI
Peak District Dales SAC	Went through to stage 4 for WQ
River Clun SAC	Went through to stage 4 for WQ
River Dee and Bala Lake SAC	Went through to stage 4 for WQ and WR but no implications for Severn Trent Water
River Mease SAC	Went through to stage 4 for WQ and WR
River Wye SAC	Went through to stage 4 for WQ and WR. Results of Stage 4 are not yet available[34].
Severn Estuary SCI	Gone through to stage 3 for WQ and WR, EA still undertaking stage 3 so have no conclusions from this yet.
South Pennine Moors SAC	Gone through to stage 3 and completed. Only waste and ppc licences and ground water (sheep dip)
The Stiperstones and the Hollies SAC	Concluded No LSE
West Midlands Mosses SAC	Concluded No AEOI
Wye Valley and Forest of Dean bat sites SAC	Gone through to Stage 4 for WQ (linked to River Wye).
Wye Valley Woodlands SAC	Gone through to Stage 4 for WQ (linked to River Wye).
Humber Estuary SPA	All licences were affirmed (finding No AEOI) except for 7 which required changes for either entrainment of lamprey or toxic contamination. No impact upon Severn Trent Water[35]
Severn Estuary SPA	Gone through to stage 3 for WQ and WR, EA still undertaking stage 3 so have no conclusions from this yet.
South Pennine Moors	Gone through to stage 3 and completed. Only waste and ppc

[33] Environment Agency, Pers Cm. 2nd email received on 10th March 2009

[34] Environment Agency, Pers Comm. Email received on 20th March 2009

[35] Environment Agency, Pers Comm. 2nd email received on 10th March 2009

Phase 1	licences and ground water (sheep dip)
South Pennine Moors Phase II	Gone through to stage 3 and completed. Only waste and ppc licences and ground water (sheep dip)
Walmore common SPA	Concluded No LSE

There are 3 sites where changes are needed to abstraction licences to address adverse effects on integrity from reduced flows and 7 sites where changes are needed to deal with water quality issues.

The EA guidance sets out that water companies should only include those sustainability reductions that the EA has identified as being definite[36]. The review of WRMPs following consultation has allowed Severn Trent Water and South Staffordshire Water to incorporate the RoCs that were completed in 2008, for example for Brown Moss SAC, Cannock Chase SAC, and Cannock Extension canal SAC. Due to the delay in the release of the Welsh Water dWRMP, WW have not yet had an opportunity to revisit their plan and revise it in light of the relevant RoCs that have been completed since March 2008.

Unfortunately, it seems that the RoCs that are still under consideration, and where the requirements are still uncertain, are those for European sites where concerns were flagged in the Phase Two HRA report about water quality and suitable flow conditions. These sites include the River Mease SAC, River Wye SAC and the Severn Estuary SCI/ SPA. Any changes to licences affecting the River Dee and Bala Lake SAC will not have implications for Severn Trent Water.

The outstanding uncertainties may affect future resource availability or ability to provide additional sewage capacity.

Assurances have been given by the South Staffordshire Water that the sustainability reductions can be accommodated and that there will be no impact on European Sites due to additional water abstraction resulting from the plan. For Severn Trent Water a RSA Sensitivity Analysis will be available for the statutory nature conservation bodies before the publication of the FWRMP to provide evidence to confirm that headroom is available to accommodate the sustainability reductions and without drawing on other sources that may have a likely significant effect on European sites. For Welsh Water sustainability reductions really are an outstanding challenge and the final options in the FWRMP will be dependent on the finalised licence reductions proposals.

4.4 Review of CAMS

Water resources in England and Wales are managed by the Environment Agency (EA). One of the ways that this is done is through licensing the abstraction of water. As part of this responsibility, it has prepared, or is in the process of preparing Catchment Abstraction Management Strategies (CAMS) for all catchment areas. These CAMS:

- Inform the public on water resources and licensing practice.
- Provide a consistent approach to local water resources management.
- Help to balance the needs of water users and the environment.
- Involve the public in managing the water resources in their area.

[36] Environment Agency (2008) Water Resources Management Plans Guidelines

The key issues covered by the CAMS include:

- Identification of the most suitable options for managing water resources.
- Identification of how much water is needed to protect the river environment, including the fish.
- Identification of how much water is needed by abstractors (e.g. water companies) and other legal water users (e.g. those involved in navigation).
- Assessment of the availability of water in catchments.

The CAMS set out how, by assessing water availability within catchments and managing the granting of abstraction licences, the EA seeks to protect the water environment by preventing over abstraction during periods of low flow. This has been achieved by identifying the 'resource availability status' for specific Water Resource Management Units (WRMUs) and Groundwater Management Units (GWMUs) within individual catchments. There are four categories of water availability:

- Water available;
- No water available;
- over-licensed;
- over-extracted

Relevant CAMS for West Midlands and their status is as follows:

- Derbyshire Derwent CAMS (completed 2006)
- Dove CAMS (Completed 2006)
- Severn Corridor CAMS (Completed 2003)
- Severn Uplands CAMS (completed 2005, updated 2006)
- Severn Vale CAMS (completed 2005)
- Shropshire Middle Severn CAMS (Completed)
- Staffordshire Trent Valley CAMS (Completed)
- Tame, Anker and Mease (Completed 2008)
- Teme CAMS (Completed)
- Lower Trent and Erewash CAMS (replaced Trent Corridor CAMS) (Completed)
- Warwickshire Avon CAMS (Completed)
- Worcestershire Middle Severn CAMS (Completed)
- Wye CAMS (Completed 2008)

It should be noted that CAMS are undertaken separately from the Restoring Sustainable Abstraction programme. Although CAMS strategies will identify actions necessary to ensure that the EA complies with its duties under the Habitat Regulations the CAMS process is not as stringent and the findings are not binding upon the water companies. The water companies have had guidance from the Environment Agency not to include any potential impact of the CAMS (or Water Framework Directive) within the WRMP09 projections of future deployable output[37].

[37] Severn Trent Water (Draft Version May 2008) Water Resources Management Plan 2009

However, CAMS are examined here as they will be considered in future investigations into the contribution made by abstraction to any failures to achieve Good Ecological Status (under the WFD) and requirement to achieve this is likely to cause additional pressure on the supply demand balance. This may lead to consideration of other supply options which impact on European sites. They also provide an indication of where catchments are over licensed or over extracted.

Any reductions identified through the Environment Agency's CAMS process will require further investigations via the RSA programme.

Table 7 provides a brief summary of the CAMS, indicates the situation in each catchment with regard to the four categories of water availability and notes issues to be considered with respect to assessment of impacts on the integrity of European sites. This information has been used to inform the conclusions in Section 6.

Table 7 Water Availability Status in Relevant CAMS Areas[38]

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
Lower Trent & Erewash CAMS (replaced Trent Corridor CAMS) (Derby, Nottingham, Grantham)	East Midlands South Staffordshire	WRMU 1. Rivers Trent, Erewash, Greet & Devon and Diseworth Sherwood Sandstone Group GWMU	WRMU 4. River Leen and the Hucknall Lower Magnesian Limestone GWMU	WRMU 3. Wollaton Sherwood Sandstone Group GWMU	WRMU 2. Dover Beck and the Ravenshead (south) Sherwood Sandstone Group GWMU	WRMU 1: Licences will continue to be granted for this WRMU. It is not envisaged that this WRMU will move towards no water available due to large volume of water available and uncertainties as to whether it would be feasible to licence it in timeframe. WRMU2: The target for this unit is to remain at Over Abstracted. No more abstraction licences will be granted and existing licences will be encouraged to voluntarily reduce volumes abstracted. WRMU3: Target is to stay 'over licensed' with aim to move towards 'no water available' this would involve a presumption against the issue of new licences and variations in existing licences. WRMU 4: The aim is to remain at 'no water available' at low flows. Future licences would be granted but would be subject to Hand Off Flow (HOF) conditions. For the stretch of the river between the Sow confluence and the Tame confluence the resource availability is “No water available”. This section contains the Pasture Fields SaltMarsh SAC and lies within the Severn Trent Water Resource Zone. The improvement in resource status downstream of the Tame confluence is largely due to the artificially enhanced flow in the Tame, arising from Birmingham’s treated sewage effluent, entering the Trent. This effluent mostly originates from the water company’s abstraction sources on the River Severn that supply the West Midlands conurbation and so this is a net import of water into the Trent catchment Should

[38] sourced and adapted from STWL WRMP Strategic Environmental Assessment (SEA) Final Draft Environmental Report with reference to the Environment Agency’s Catchment Abstraction Management Strategies

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
						be considered in relation to effects on the Humber Estuary sites.
Derbyshire Derwent CAMS (Derby, Belper, Buxton, Matlock)	East Midlands	N/A	WRMU 2. Wye and Tributaries WRMU 4. Amber WRMU 5. Ecclesbourne and Markeaton	WRMU 1. Derwent Uplands WRMU 3. Middle Derwent WRMU 6. Derby to confluence	N/A	The Derbyshire Derwent CAMS has concluded that the River Derwent is 'over licensed', with too great a proportion of the flow having been licensed for abstraction at all but high flows. However, in combination licences within the catchment are not fully utilised suggesting that licence holders are authorised to abstract a greater volume of water than they typically require. Further licenses will be granted subject to appropriate HOF conditions
Tame, Anker & Mease In Progress (Burton on Trent, Tamworth, Hinckley, Nuneaton and Birmingham)	Birmingham	N/A	N/A	N/A	N/A	In progress The River Mease SAC is within this area. Future work should refer to findings of CAMS
Worcestershire Middle Severn CAMS (Telford, Wolverhampton, Dudley, Kidderminster, Bromsgrove, Droitwich and Worcester)	Staffs and East Shropshire Severn South Staffordshire	N/A	WRMU 1. Dowles Brook (flows into River Severn which has No Water Available)	N/A	WRMU 2. Stour, Worfe & Salwarpe WRMU 3. Triassic Sandstone Aquifer (GWMU)	WRMU 1: Target is 'No Water Available'. New licences will be granted subject to appropriate HOF conditions. Existing licences will also be subject to HOF conditions. WRMU 2 and 3: Target is 'Over Abstracted'. No new licences will be granted for abstraction at times of low flow. New licences will be subject to restrictive HOF conditions. Existing licences will be encouraged to reduce abstraction volumes. No increases will be granted at low flow. Needs to be considered in reference to Severn Estuary sites
Severn Vale CAMS	Forest and Stroud	N/A	WRMU 1: Carey's Brook and Bushley Brook	WRMU 9: Ell Brook and GWMU	WRMU 4: Cinderford Brook	WRMU 1, 2, 3, 5, 6, 7 and 20: Target status is to stay at 'No Water Available'. Licences will be granted with appropriate

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
(Cheltenham and Gloucester)			WRMU 2: River Chelt and Hatherley Brook WRMU 3: Westbury and Lyd South West Tributaries WRMU 5: Gloucester and Sharpness Canal Tributaries WRMU 6: Upper Frome and Tributaries and GWMU 20 Cotswold WRMU 7: River Leedon and Red Brook	WRMU 17 Oxenhall South	WRMU 8: Glynch Brook GWMU 18 Bromsberrow WRMU 19 Oxenhall North	HOF conditions. WRMU 9 and 17: Target status is to move to 'No Water Available' by encouraging voluntary reductions in the licensed volumes down to the actual take. Further abstraction licences will be granted during high flows only and subject to appropriate HOF conditions. WRMU 4, 8, 18 and 19: Target status is to move to 'Over Licensed' by encouraging voluntary reductions in actual used volume with equivalent reduction in licensed volume. No new surface water abstraction licences will be granted at low or medium flows. Surface water abstraction licences will be granted only during high flows and subject to restrictive HOF conditions. There will be a presumption against any new groundwater abstraction licences. Needs to be considered in reference to Severn Estuary sites
Shropshire Middle Severn CAMS (Shrewsbury, Telford, Newport, Market Drayton, Church Stretton, Oswestry)	Staffs and East Shropshire Severn	N/A	WRMU 4. Cound Brook WRMU 5. Rea Brook (flows into the River Severn which has 'No Water Available' Status)	WRMU 1. River Perry and associated groundwater units. WRMU 2. Tern Catchment and associated groundwater units.	WRMU 3. Coley Brook and Aqualate GWMU. GWMU Sambrook East, Adneney & Longdon.	For all WRMUs HOF restrictions will apply to new licences and winter storage reservoirs and other water efficiency measures will be encouraged. WRMU 1 and 2: Target is to maintain 'Over Licensed' status. Short term licences only will be granted for groundwater abstractions. Existing licences will be subject to same conditions as new licences and reductions in abstraction volumes will be encouraged. WRMU 3 and GWMU: Maintain 'Over Abstracted'. Aqualate Groundwater Unit is closed to further licences. Existing licences will be subject to same conditions as new licences and reductions in abstraction volumes will be encouraged. WRMUs 4 and 5: target is to maintain 'No Water Available'. Licences for renewals will only be passed subject to achieving certain criteria. Needs to be considered in reference to Severn Estuary sites
Severn Uplands CAMS	Severn	1. Dulas, 2. Trannon, 3. Carno, 4. Rhiw, 5	WRMU 8. Tanat	N/A	N/A	Water available for 1, 2, 3, 4, 5, 6, 7, 9

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
(Oswestry and Welshpool)	Oswestry	Camlad, 6. Banwy, 7. Cain, 9. Morda	WRMU 10. Weir Brook			New licences and renewals will be evaluated in accordance with national guidance and specific criteria. Tanat WRMU is the largest catchment at 244km2 and has the most licences. The majority of water abstracted in this unit is transferred into the Montgomery Canal to maintain water levels. The Tannat River flows straight into the River Severn. The total catchment area for the Weir Brook is 35km2. This river flows straight into the River Severn. There are no SSSIs in this area but lamprey has been found which is protected under the UK BAP and is a qualifying feature for the Severn Estuary SCI (although species occurrence descriptions not yet available). Should also be considered in relation to River Dee and Bala Lake SAC. RoC stage 4 requires sustainability reductions but this does not affect Severn Trent Water.
Warwickshire Avon CAMS (Coventry, Rugby, Warwick, Royal Leamington Spa, Stratford upon Avon, Redditch, Evesham)	Severn	N/A	River Dene (Wellesbourne) River Stour (Alscot Park) River Arrow (Broom) River Avon (Evesham) River Sowe (Whitley GWMU) River Avon (Kenilworth GWMU) River Stour and Isbourne and Badsey Brook (Cotswold GWMU) River Avon (Stareton,	River Sowe (Stoneliegh) River Leam and Itchen (Leamington) River Isbourne (Hinton) Avon Confined (GWMU)	Rivers Avon (upper Avon) and Swift (Rugby) Bow Brook (Besford Bridge) River Sowe (Coventry GWMU) River Avon (Warwick GWMU) Bow Brook (Bromsgrove GWMU) No River (Avon confined GWMU)	Target for all is to remain at or move to 'No Water Available'. For all statuses no new consumptive licences will be granted at low flows, surface water abstraction licences will be subject to HOF conditions, New licences will have a time limit of 31st March 2013. Existing abstractors will be encouraged to use water efficient practices. Renewal will be subject to time limits. For 'no water available' Groundwater licences from minor aquifers will be assessed on case by case basis. No new groundwater abstraction licences from minor aquifers will be granted in 'Over Licensed' and 'Over Abstracted' units. Needs to be considered in reference to Severn Estuary sites

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
			Stratford, Upper Pound) Badsbey Brook (Offenham) Piddle Brook (Wyre Piddle) River Swilgate (Swilgate)			
Severn Corridor CAMS	Severn South Staffordshire	A. River Vyrnwy Dam to Llanymynech B. Llanymynech to Severn confluence WRMU 1. Clywedog Dam to Severn confluence WRMU 2. Dolwen to Crew Green WRMU 3. Crew Green to Buildwas WRMU 4. Bulildwas to River Worfe confluence	WRMU 5. River Worfe to River Stour confluence WRMU 6. River Stour confluence to River Teme confluence WRMU 7. River Teme confluence to Saxons Lode WRMU 8. Saxons Lode to Deerhurst WRMU 9. Deerhurst to Gloucester Docks WRMU 10. Gloucester Docks to Minsterworth WRMU 11. Minsterwoth to Sharpness	N/A	N/A	For all units – new and renewals will be subject to time limit of 31st March 2010. New or varied abstractions from Severn and Gloucester and Sharpness Canal will be subject to conditions. For River Vyrnwy summer abstractions will be subject to HOF conditions. For River Severn and River Clywedog, upstream of Severn/Vyrnwy confluence, licences subject to HOF condition. All applications will be assessed in terms of effect on Severn Estuary
Staffordshire Trent Valley CAMS (Stoke, Stone, Stafford, Cannock, Litchfield,	Staffs and East Shropshire South Staffordshire	GWMU Oulton, Hardwick and Hopton GWMU Coven	WRMU 1: The Upper Trent WRMU 2. Lower Trent and Swarbourn. WRMU 3. Rivers Sow and Penk.	GWMU Rugeley and Teddesley	WRMU 4. Scotch Brook GWMU Tittensor, Hatton, Spot and Forsbrook.	WRMU1 and WRMU2 - Upper and Lower Trent and the River Swarbourn. Resource availability status is 'No Water Available'. Any new licences issued will be subject to HOF conditions. WRMU3 - Rivers Sow and Penk. River Sow upstream of D Marshes is 'Over Abstracted'. River downstream of Doxey Mar 'No Water Available'. River Penk has 'Water Available' - ex

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
Rugeley)			WRMU 5: River Blithe GWMU Bishops Wood			licences will be less restrictive and new licences will be grante WRMU4 - Scotch Brook is 'over abstracted'. Scotch Brook is closed to new abstractions. Situation will be subject to further review. WRMU5 - River Blithe has 'no water available' in lower reaches and 'over abstracted' in upper reaches. River upstream of Blithfield Reservoir will remain closed to new licences.
Dove CAMS (Leek, Cheadle, Uttoxeter, Ashbourne)	Staffs and East Shropshire South Staffordshire	N/A	N/A	N/A	WRMU 1. River Dove WRMU 2. River Churnet including tributaries	WRMU 1 and 2: Target 'no water available' status. Most significant change is renegotiation on the conditions on the critical STWL licence at Eddington. For new licences HOF conditions applied for Marston-on-Dove and Quixhill. Local HOF conditions unlikely to be applied to new licences. No groundwater abstraction licences will be granted for Leek, Alton, Tean and Greatgate GWMUs due to dependency of surface water on baseflow, especially at low flow. Use of winter storage reservoirs will be encouraged. Also voluntary revocations of unused licences and reductions in licence volumes. The catchment does not contain any of the European sites listed in Table 1 and Table 2 but includes the Peak District Dales SAC, Peak District Dales SAC and South Pennine Moors Phase I SPA. Both Water Resource Management Units within the CAMS are stated as being "over abstracted" at low flows. The largest abstraction is held by Severn Trent Water.
Teme CAMS (Tenbury Wells, Ludlow, Knighton, craven Arms)	Severn	N/A	Teme Water Resource Management Unit	N/A	NA	Water Resource Management Unit 1 – encompasses the entire Teme catchment. Teme Catchment. The resource assessment for the Unit is 'Water Available', however the Teme flows into the River Severn which forms part of the Severn Corridor CAMS which is classed as 'No Water Available'. There is a further requirement on the Agency to protect the designated and

CAMS Area	Relevant WRZs	Water Resource Management Unit (WRMU) and Groundwater Management Unit (GWMU)				
		Water Available	No Water Available	Over-Licensed	Over-Abstracted	Comments
						non designated sites. As a result this Unit is also classed as 'No Water Available'. There are 123 licensed abstractions, including abstractions for public water supply, spray irrigation and general agricultural uses.
Wye CAMS (Hereford, Monmouth, Leominster, Ross-on-Wye and Hay-on-Wye.	Birmingham Forest and Stroud Pilleth Whitbourne Hereford CU Vowchurch Ross on Wye Monmouth	N/A	WRM 1: (the Lower Wye) WRMU 8 (Upper Wye) WRMU 10 (River Lugg) WRMU 17 (Eign/Yazor Brook)	N/A	N/A	WRMU 1 comprises the River Wye downstream of Hereford and below the confluence with the Lugg, and includes the Wormbrook, Dore, Garren Gamber, Monnow and Trothy tributaries. There is 'No Water Available' and the current licensing policy will continue to be applied in this unit until the CAMS/Habitats Directive integrated licensing policy becomes available. WRMU 8 (the main River Wye from the reservoirs of the Elan Valley to just upstream of the confluence with the River Lugg) and WRMU 10 (River Lugg and its tributaries the Pinsley, Arrow and Frome). The strategy for these WRMUs is also to remain at 'No Water Available' and apply the current licensing policy until the CAMS/Habitats Directive integrated licensing policy becomes available. WRMU 17 is a relatively small unit containing the Eign and Yazor Brooks to the confluence with the River Wye. The strategy for this WRMU is to remain at 'No Water Available'. The River Wye and its tributaries contain and affect several European sites listed in Table 3 including the River Wye SAC and the Severn Estuary SCI, SPA and Ramsar. All of the 4 WRMU have been assessed individually and together as having 'no water available' at low flows. The RoC process will determine the level of abstraction where "no adverse effect" on the integrity of the SAC can be concluded

5 In combination effects

In combination effects could be considered in a number of forms:

1) Pressures on European sites from other demands on water sources or from activities which may affect water quality; and

2) Additional pressures on European sites from other types of impact which may have a synergistic effect with low flows or deteriorated water quality and result in an adverse effect.

This analysis focuses on the first of these, as the in combination effect of different types of impact have been considered in the Phase Two HRA 2007 and it is not within the scope of this study to consideration the possible interaction and in combination effects from multiple different impact types. However, it is recognised that large sites such as the Severn Estuary SCI, SPA, Ramsar and the River Wye SAC have an enormous number of other impact pressures including *inter alia* extensive recreational use, physical modification and dredging. For this reason and the uncertainly related to the interactions between these pressures it is important to be precautionary in the conclusions drawn in this report.

With regard to point 1, other demands on water resources and changes to water quality may include those associated with other regions housing and economic growth, and a multitude of other sources inside and outside the region including *inter alia* power station cooling, abstractions to feed canals, abstractions/discharges for agriculture and aquaculture. By themselves, the WRMPs and proposed schemes within them might not represent significant environmental effects; however, when combined with the proposed schemes in WRMPs for other water companies, some cumulative impacts may occur. This is more likely to occur where different water companies are planning to utilise the same resource, for example surface water abstraction from the River Severn.

If one examines the SEAs & HRAs of the WRMPs it seems that only a brief examination of cumulative and in combination effects has been done. This reflects the difficulties of “in combination” assessment and emphasis the need for a precautionary approach in light of any uncertainties relating to in combination effects.

When considering the issues of water supply and water quality in respect of European sites the Environment Agency’s review of consents provides a detailed cross boundary comprehensive consideration of existing in combination effects. The RoC process examines consented abstractions and discharges from the perspective of safeguarding the European site integrity regardless of region, type of consent or licence and process of abreaction or discharge. Outcomes of the RoC are included in section and indicate whether consents or licences need to be changes.

What the RoC process cannot tackle is the issue of diffuse pollution from agriculture or from pollutants such as sediment, oil, pesticides collecting on hard surface like recreational areas, roads and pavements and then entering rivers during rain events. This is impossible to quantity within the limited timescale and scope of this study and possibly never. Instead this diffuse, cumulative and in some cases in combination issue should be recognised and all possible measures within the scope of the RSS be taken to help address it. For example; urban pollution problems can be overcome using Sustainable Drainage Systems (SUDS) and if incorporated into a green grid or green infrastructure plans.

The RoC process also does not cover future effects of pressure from forecast growth. When considering the potential effect of the housing and commercial growth associated with other regions, and demand associated with this, it is important to consider the European site concerned, the water resources zone(s) in which the

European site lies, the geography of the catchment and the area over which the water company needs to provide water.

Information on other water companies' plans or other RSS growth numbers that affect a particular site have been included within tables Table 9 and Table 11. The in combination issues and uncertainties related to each site are discussed in Table 8.

Table 8 In combination effects

Site	In combination effects
Pasturefields Salt Marsh SAC	Drainage and abstraction may alter the salinity of the site, as well as increasing concentration of pollutants although the recent review of consents concluded no risk at present. An increase in freshwater levels at the site would a detrimental effect on saltmarsh plant species. Position is unclear regarding this but site water-level management is important the diluting effects of the central ditch on site appear to have been remedied. The RoC by EA suggests the impact of flooding and water management works is negligible. Site management and an appropriate grazing regime is important.
River Dee and Bala Lake SAC	Where were concerns regarding cumulative effects of abstractions from river as 4 water companies abstract from sources that affect the River Dee including United Utilities (UU), Dee Water Valley, Welsh Water and Severn Trent Water. United Utilities which serves most of the NW region account for 90% of potable water abstractions from Dee River and abstractions might be expected to rise to service the proposed growth in the NW region. However, UU have confirmed that no there will be no further increase in abstractions from the Dee River. Dee Valley Water and Welsh Water also abstract from the River Dee but the licence is held by UU and UU stated it was "unlikely they will apply for a higher abstraction licence". This would need to run past UU. Severn Trent Water abstract from ground water sources that may affect levels in the Dee but
River Mease SAC	The Mease may be affected by proposed housing growth in two regions. Two water companies abstract from it but only one discharge to it (Severn Trent Water). The RoC process has highlighted problems with regard to Phosphates and actions need to be taken to reach these targets. The proposed housing growth in both the East Midlands and the West Midlands RSSs will need to take into account the constraints posed by the capacity of the River Mease.
River Wye SAC	Its linear catchment reduces the potential for multiple in combination effects. Nonetheless it passes through the West Midlands and Wales and is drawn on by two water companies. The interactions between Welsh Water and Severn Trent and the demands from both Wales and England on this river have been covered in section 2 and 3. The issues regarding demands on water from Birmingham, for transfer for use in Cardiff are being planned for through the WRMP. If a reduction in transfer results in a possible increase in Water needed from the River Usk it is not a result of proposed RSS growth but due to the sustainability reductions required. Both Welsh Water and Severn Trent Water discharge into the Wye and there are many other individual consented discharges as well as the issue of diffuse pollution. As the catchment is largely rural this mostly relates to agricultural sources. Future water quality problems have been recognised and recommendations are made below to tackle the RSS's contribute to possible future impact
River Usk SAC	The HRA of dWRMP does not explain the specific in combination effects in relation to the Usk but only discusses the net likely of affect of other plan on European sites generally so this cannot be drawn on for an understanding of all the water demand from this River. Certainly housing growth within South East Wales may lead to a increase in demand and one option could be further abstraction from the River Usk. Apart from the question of transfer from the Wye

	at Monmouth, no aspects of the West Midlands RSS have been identified as possibly generating likely significant effects that need to be considered in combination with pressures and demands in Wales on this SAC.
Severn Estuary sites	The picture is more complex for the Estuary as apposed to the designated sections of Rivers within the Region. Waste Water from numerous urban areas reaches the Severn Estuary. Three water companies draw from the River Severn, and growth in two regions will heavy rely on the River Severn for water. Bristol obtains 50% of its water from the River Severn during summer months. Other Major abstractions from the river or estuary include, cooling water for power stations and the Gloucester - Sharpness Canal. Domestic discharge and pollution runoff from the West Midlands needs to be considered alongside local pollution point sources, nutrient runoff from agricultural land around the Estuary, and activities such as dredging and shipping. The lack of clear understanding regarding the environment capacity of the European sites on this estuary and the contribution from the West Midlands suggests a precautionary approach is needed.

6 Implications for European Sites

6.1 Effects of changes in Water Supply on the integrity of European sites

The evidence reviewed above has been summarised and collated in an attempt to assess the risk of an AEOI alone and in combination from the demand in water associated with new housing growth in the West Midlands. Unfortunately much of the evidence that the Phase Two HRA 2007 suggested should be revisited in order to make a judgment on AEOI as still not been finalised. In particular conclusions from the RoC process are still outstanding for a number of critical sites and these conclusions need to be accommodated within the WRMP to have complete confidence that water demand can be meet without AEOI of certain European sites.

Using the existing evidence and through consultations with the water companies, the EA, NE and CCW we have made judgements on the risk to site integrity from the increase in water demand from the RSS Phase Two Preferred Option and the NLP study. Table 9 collates the available evidence against each site and examines whether it is possible to conclude to no AEOI.

To summarise:

- River Dee and Bala Lake SAC – No Adverse Effect on Integrity
- River Mease SAC – No Adverse Effect on Integrity
- River Wye SAC - No Adverse Effect on Integrity from quantum of growth but specific locational issue remains for the Pilleth WRZ that need to be tackled through RSS policy to be able to confirm 'No AEOI'.
- River Usk SAC – 'No AEOI'
- Severn Estuary SCI, SPA, Ramsar – 'No AEOI' but the WFD/RSA Sensitivity Analysis should be made available to the statutory nature conservation bodies before the finalisation of the RSS to confirm this.

Recommendations to address these issues follow in section 7.

Table 9 Effect of housing growth on water availability at water dependent SACs

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
River Dee and Bala Lake SAC.	Issues of concern are with fish entrainment and with the potential for some abstractions to reduce flows. RoC indicates that some current abstractions are having an effect and will have to be modified. Possible cumulative adverse effect on integrity as Welsh Water, Severn Trent Water and Dee Valley Water all take abstractions from sources that may affect this site.	Relevant CAMS outside of West Midlands region and relevant WRZ	RoC showed AEOI. Went through to Stage 4 on water quality issues and due to surface and groundwater abstraction licences[39] However, there are no implications for Severn Trent Water and their groundwater abstraction licences that have been considered during the review of consents process[40].	Severn Trent Water's dWRMP and SEA of the dWRMP make reference to the Mardy area groundwater resources which are over abstracted and linked to a tributary of the River Dee, and may be a contributory factor in low flows. There are no specific schemes or proposals in the Severn Trent Statement of response that are of risk to the River Dee and Bala Lake SAC or the Dee Estuary Ramsar Site, SPA, cSAC.	NE's response to the Severn Trent Water's dWRMP does not identify any concerns with regard to this site. EA did not mention any concerns with regard to this site at the Severn Trent Water issues meeting on the 26th January 09 CCW has not raised any concerns regarding the increase in water demand	Concerns regarding cumulative effects of abstractions from river may be unfounded. United Utilities (UU) have confirmed that no there will be no further increase in abstractions from the Dee River by UU[41]. UU account for 90% of potable water abstractions from Dee River. Dee Valley Water and	Housing growth and water demand under the RSS Phase Two Revision PO and the NLP scenarios will not lead to an adverse effect on site integrity.

[39] Natural England (2009) Pers Comm. Email Received on 5th March 2009

[40] Liz Jones (Environment Agency) Email on 10th March 2009

[41] Meeting with United Utilities hosted by 4NW (11th October 2008) Habitats Regulations Assessment of the North West Regional Spatial Strategy Partial Review Water meeting

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
					from housing growth in the West Midlands region and potential water demand from sources that affect this site.	Welsh Water also abstract from the River Dee but "unlikely they will apply for a higher abstraction licence". It would need to run past UU. As a point of clarification, UU confirmed that Lake Vyrnwy reservoir supplies the Severn Catchment and not the River Dee.	
River Mease SAC	Risk to site integrity. Review of consents has confirmed risks from future abstraction. High levels of household growth could have a significant effect if abstraction is needed	No information – CAMS in progress.	Following a finding of AEOI RoC process has gone through to Stage 4 on water quality and water resources issues.	South Staffordshire Water's dWRMP has included an indicative licence reduction. In addition South Staffordshire Water show a surplus of supply for 25 year horizon so there should in no risk in	The EA has not raised any specific concerns with this site or supply within the East Midlands WRZ and South Staffordshire WRZ.	Draft East Midlands Plan proposes housing development in the nearby towns of Coalville and Swadlincote. Final numbers	The increased water demand from the proposed housing growth can be accommodated without drawing further on the River Mease. The indicative licence reduction and the surplus elsewhere in the WRZ suggest that necessary sustainable

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
	from sources that feed the River.			accommodating sustainability reductions needed. Severn Trent Water's dWRMP does not contain any options that increase pressure on this site.	NE has concerns over possible future abstraction form affecting this site but have stated that this is not likely to be an issue as the water companies should be able to find other sources rather than abstract from the Mease.	in the East Midlands have not been confirmed. But Severn Trent Water's dWRMP and statement of response does not include options for abstraction from the River Mease or sources that feed the Mease. This additional growth in the East Midlands WRZ will be met from other sources.	reductions can be accommodated. No risk to site integrity from either the RSS Phase Two Revision PO or the additional growth proposed in the NLP scenarios.
River Wye SAC	The River Wye is subject to a review of licences and consents under the Habitats Directive which could affect future resource	All of the 4 WRMUs have been assessed individually and together as having 'no water available' at low flows. The RoC	Went through to stage 4 for Water quality and water resources issues. The results of stage 4 are still being debated	The Welsh Water dWRMP (March 08) is out of date with regards RSA information and the options being considering.	CCW requires certainty that the sustainability reductions can be accommodated with no adverse effects on	Agriculture accounts for the majority of licensed abstractions but only makes up a small proportion of the total	Major reductions are likely to be needed to licences that provide a potable water supply. The ecological risks associated with these licences and their hydrological impacts meant that the EA could not

[42] Environment Agency (2008) (note incorrectly named 2009) Nathaniel Lichfield & Partners Study – Comments from the Environment Agency

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
	availability. Although DCWW WRZs are currently stated to be in surplus during the plan period, a number of current abstraction licences cannot be concluded to have no adverse effect on site integrity. It is likely that control rules will be modified that will restrict existing abstraction licences by Welsh Water. Growth in this and adjacent regions may result in the need for abstractions that pose a risk to site integrity.	process will determine the level of abstraction where "no adverse effect" on the integrity of the SAC can be concluded.	and are currently unavailable.	However, Welsh Water has reiterated that the RSS growth is within the current headroom and that the more costly series of options are being driven by the sustainability reductions and not the proposed RSS housing growth. Severn Trent Water has no proposal to abstract additional water from Wye, and is showing available headroom in Forest and Stroud and the Severn Zone. The Severn Trent Water dWRMP statement of response does not contain options that increase abstractions from the Wye or change the regime at Elan. In addition the Severn	European sites but have not commented that the RSS growth will exacerbate this issue. The EA noted[42] that the changes to abstraction licences may require new sources of water and will have cost and timing implications.	quantity of water authorised for abstraction. Public water supply is the dominant use of water, with a large proportion being transferred out of the catchment. The water transfer to Welsh Water Water Treatment Works which supplies Cardiff may be affected by sustainability reductions but will have no influence upon the ability to supply homes in Herefordshire[43].	conclude no AEOI on the site from these abstractions. This will primarily affect Welsh Water. This does not seem to be an issue for Severn Trent Water as they have other available water sources and are showing the target headroom in the relevant WRZs. For Welsh Water these changes to licence consent means they will have to explore a more costly series of options in order to deliver the target headroom required. However, Welsh Water has reiterated that the RSS growth is within the current headroom and that the more costly series of options are being driven by the sustainability reductions and not the proposed RSS housing growth.

[43] West Midlands RSS, Wales Water Issues - HRA Meeting 10th February 2009 Conference Call

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
				Trent Water final options for the Forest and Stroud WRZ are based on metering, efficiency programmes and leakage control.			Policies in the RSS need to ensure the issue regarding the specific location of housing in the Pilleth WRZ is dealt with through the Hereford LDF. So whilst there may remain an adverse effect on the integrity of the River Wye SAC there seems to be consensus that this is devolved from the water demand associated with growth proposed under both the RSS Phs Two Revision and the NLP scenarios. This must be confirmed in the FWRMP to demonstrate this to the statutory nature conservation bodies.
River Usk SAC	Initially screened out but CCW later raised concerns that sustainability reductions on the River Wye may affect ability to transfer	The WRMU in the Wye CAMS been assessed individually and together as having 'no water available' at low	River Wye Went through to stage 4 for WQ. Changes to consents will be needed to remove AEOI.	The RSA are not taken into account in the Welsh Water dWRMP (March 08), (although the implications of the licence amendments are discussed).	EAW have stated that the abstraction for the transfer will not be affected by proposed growth in	Growth in South East Wales will put more pressure on water demand from the River Usk. The HRA	There seems to be consensus that this issue is not affected or compounded by growth in homes in Herefordshire – No AEOI. There is no transfer of

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
	water with implications for the River Usk SAC	flows. The RoC process will determine the level of abstraction where "no adverse effect" on the integrity of the SAC can be concluded.	The concern was that required reductions could possibly affect the amount of water available to transfer to the River Usk. However, Welsh Water has repeated stated that the transfer is to a Welsh Water asset and does not effect flows on the River Usk[44] and is due to sustainability reductions and will be unaffected by the growth proposed in the West Midlands Region.	EAW and Welsh Water made clear at the meeting on the 10th Feb that due to the location of the transfer and the fact that the RoC are worked out and based on fully licensed abstractions the transfer licence will not be affected by proposed growth in Herefordshire. Welsh Water went on to confirm that the Wye – Usk transfer is of no relevance to the HRA for the West Midlands RSS.	Herefordshire.	of the Wales Spatial Plan will need to assess the impact of housing growth in light of RoC licence reductions. Due to the location of the transfer in the lower reaches of the Wye this does not seem to be an in combination impact that needs to be considered by the West Midlands RSS HRA.	water between the Wye and the Usk. The only transfer from the Wye, is Welsh Waters abstraction at Monmouth, and this directly supplies a water treatment works not the river.
Severn Estuary SCI, SPA,	Severn system currently under stress. WRZ likely to	The Severn Corridor CAMS assigns the	Gone through to stage 3 for WQ and WR, EA still	Severn Trent Water has no proposal to abstract additional	EA's agree with Severn Trent Water's SoR	SW RSS growth adds more pressure to	The existing abstractions may be having an adverse effect on the sites in the

[44] Welsh Water (2009) added as corrections to the draft report on 12th March 2009

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
Ramsar	go into deficit in near future. Housing and economic growth poses risk to site integrity and water demand increases from the Severn Corridor. Habitats Directive Review currently underway which may limit existing abstractions and be a tension in areas of growth.	status of "no water available" to the Severn Corridor in its entirety in order to protect the river and current abstractors. Resources would only be increased if a new phase of the Shropshire Groundwater Scheme were developed. All licences will be reassessed for effect on European site.	undertaking stage 3 so have no conclusions from this yet.	water from the Severn. Severn Trent Water has stated that the increase in housing numbers proposed through the NLP scenarios wont have a material impact upon the FWRMP and there is headroom available for uncertainty.	which demonstrates that the zone is in surplus throughout the planning period based on preferred option 2 of the RSS[45].	abstractions from lower reaches of the Severn. Other Major abstractions from the river or estuary include, cooling water for power stations, the Gloucester - Sharpness Canal and 50% of Bristol's water in summer months. The Estuary sites will also be affected by water quality and flows from Welsh Rivers.	Estuary. The RoC hasn't been completed. Severn Trent Water has no proposals to abstract additional water from the Severn to supply growth of population and housing and many of its schemes seek to reduce pressure on the Severn WRZ so it seems that the growth under the RSS Phase Two PO and the NLP scenarios can be accommodated without an AEOI. However, considering that the relevant CAMS state that there is no water available and the Severn system is under stress it is sensible that a RSA site sensitivity analysis is being undertaken. Options for dealing with possible sustainability reductions may be limited in the future. Until the RoC conclusions and RSA information is

[45] Environment Agency (2009) pers Comm. Email received 25th March 2009

European site	Conclusions from HRA 2007	Updated information from CAMS	Findings of Roc	Issues /conclusions from WRMP	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS Phase Two Preferred Option and NLP study
							made available need to include precautionary policy to conclude no AEOI

6.2 Effect of changes in water quality on the integrity of European sites

Strategic information supporting the analysis of impact of regional housing growth on water quality and capacity of waste water infrastructure is not as readily available as that supporting the analysis of water supply.

The water companies are not required under legislation to produce a strategic study showing the balance of capacity and demand in the same way that water resource plans are required under the Water Act 2003.

Information reviewed above that supports the analysis of this issue and builds on the findings of the HRA 2007 includes the following:

- The RoC conclusions;
- The EA's comments on the NLP study; and
- The notes from the meetings with STW, Welsh Water, NE, CCW, EA and EAW.

To summarise the findings of these are follows:

1). changes will be required to consents to remove adverse effects on integrity at the Peak District Dales SAC, the River Clun SAC, River Mease SAC, River Wye SAC, Wye Valley and Forest of Dean bat sites SAC and Wye Valley Woodlands SAC[46]. In addition, the RoC process has gone through to stage 3 for the Severn Estuary SCI and SPA following a finding of likely significant effect but the conclusions are not available yet.

2). The EA has foreseen capacity issues which will be a particular issues for Bromsgrove, Coventry, Lichfield, Solihull, Bedworth and the Black Country as sewage treatment works serving these already discharge to controlled waters that offer little dilution. However, they have not suggested this is a showstopper and it is not clear at what housing level will become a problem. No figures were available in the EA comments on the NLP study and the EA have not provided an update to the EA 2007 technical paper[47].

3). The EA note that the increase in 'hard' paved areas will increase the run-off of rainwater into existing combined sewerage systems and could result in spills of untreated sewage into the environment from combined sewer overflows and storm tanks.

4). The EA has maintained their view that sewage infrastructure may be an issue across the region and needs to be assessed and developed along side any growth proposals. However, this is not considered to be a showstopper and considering the remit if the EA, this opinion should apply to protection of European sites as well as compliance with other European legislation.

5). Natural England has concerns about the River Wye SAC, as concentrations being discharged are currently affecting certain sites. It would be very expense to transfer the waste water to another catchment and NE has requested that Welsh Water need to demonstrate that the additional waste water associated with growth can be accommodated.

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[46] Wye Valley and Forest of Dean bat sites SAC and Wye Valley Woodlands SAC - These are discharge consents which have been reviewed as part of the River Wye SAC, all the WQ consents have been dealt with under the Wye. There are no other outstanding issues.

[47] Environment Agency (2007) West Midlands Regional Spatial Strategy (RSS11) impact of housing growth on water quality and waste water infrastructure.

6).Welsh Water has not raised any concern about delivering water quality improvements on the River Wye or accommodating housing growth in Herefordshire.

7) Severn Trent Water has not provided a position statement concerning capacity of their Sewage Treatment Works and whether this may have implications for European sites.

Referring back to the risk assessment in the EA 2007 technical paper[48] (as no comprehensive update has been made available) it seems that there are overlaps between some of those sites where changes to consents are needed due to adverse effects on integrity and those sewage treatment works where there is a risk that the works are going to have difficulty expanding to accommodate additional growth[49].

Table 10 STWs with a risk that they cannot be expanded to accommodate growth upstream of European sites where there was a findings of AEOI

European Sites with finding of AEOI from RoC process	**STWs upstream of Site which were identified as being of high and medium risk[50]**
River Wye SAC	Moreton on Lugg STW – Medium Risk Rotherwas STW – High Risk
Severn Estuary cSAC (now SCI) SPA & Ramsar	Multiple STW's at high and medium risk in Severn WRZ

In addition, whilst this table only lists medium to high risk STWs, those identified in the low risk category may also pose a risk depending on the changes to consents and improvements needed to protect the integrity of the European sites concerned.

Table 10 suggest there might be some cause for concern. However, it should be noted that there are numerous assumptions in the EA technical paper due to the lack of actual data. This is a broad brush assessment which is still to be updated and the paper itself states that it should not be viewed as a rigorous classification. It may be that options are now available which remove the potential capacity risk associated with these STWs, but this needs to feed into a review of the region's capacity so that the RSS can reflect this in the final decisions on housing growth.

Table 11 collates the available evidence against each site and examines whether it is possible to conclude to no AEOI. To summarise:

- Pasturefields Salt Marsh SAC – No AEOI
- Severn Estuary SPA – No AEOI
- River Mease SAC and River Wye SAC and Severn Estuary SCI/ Ramsar – unable to conclude no adverse effect.

[48] Environment Agency (2007) West Midlands Regional Spatial Strategy (RSS11) impact of housing growth on water quality and waste water infrastructure.

[49] The technical paper risk assessment puts works into different categories depending on how difficult it would be to improve quality of the discharge and how close they are to discharging the consented volumes.

[50] EA (2007) impact of housing growth on water quality and waste water infrastructure. Annex 1 – risk assessment of the potential for expansion of sewage treatment works in the West Midlands.

Table 11 Effect of housing growth on water quality at European sites

European site	Conclusions from HRA of the RSS Phase Two Revision (2007)	Findings of Roc	Capacity risk of STW	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS phase two PO and NLP study
Pasturefields Salt Marsh SAC	This site is periodically affected by flood water from River Trent which has high sewage loadings and additional loadings from surface water runoff. This problem could be exacerbated by housing development upstream at Newcastle under Lyme, Stafford and Stoke on Trent Water quality during flood events and its effects on the site is the subject of another appropriate assessment planned by the Environment Agency and Natural England (Terms of Reference yet to be agreed). This needs to be reviewed when that information is available.	No adverse effect on integrity	The STWs upstream of the site have been identified in the EA 2007 technical paper as being at high risk (Strongford STW) and medium risk (Pirehill STW).	No specific comments made during meetings	The effect of sewage loadings and additional pollutants from surface water runoff being exacerbated by housing development upstream was the only issue which was identified as being link in combination to the influence of the RSS. Issue regarding declining salinity are being tackled by diverting freshwater ditches	The RoC concluded no AEOI. Despite possible issues of capacity for expansion no changes are needed to consents. No AEOI from either the Phase Two Revision Preferred Option or the NLP scenarios.
River Mease SAC	Existing water quality problems also associated with agricultural run-off. Decision dependent on understanding capacity	Conclusion on AEOI. Gone through to stage 4 for Water quality and water resource issues. A number of local STW	These local STW serve less than 10,000 people and so weren't assessed for	NE raised particular concerns as the RoC has identified there are already	As identified in the RSS Two Revision 2007 HRA There are settlements around the Mease smaller than 10,000 people	There are existing water quality issues particularly with phosphates. Need further specific in depth studies to address this. Specific site locations of

European site	Conclusions from HRA of the RSS Phase Two Revision (2007)	Findings of Roc	Capacity risk of STW	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS phase two PO and NLP study
	and situation of local STWs. However, if STWs do not currently discharge into Mease it is unlikely that Phase Two will have an adverse effect on integrity as site is in rural location. Habitats Directive Review is currently being undertaken by the EA for this site and decision should be reviewed when the results are available	need changes for Phosphate: Measham STW, Netherseal STW, Edingale STW, Snarestone STW, Clifton Campville STW. Changes are also needed at Measham STW due to BOD. And for Ammonia: Measham STW, Netherseal STW, Snarestone STW and Packington STWs.	risk through the EA's technical study 2007. Severn Trent Water have not commented on whether there are any STW capacity issues.	AEOI at this site party due to point discharges. The EA commented that there are issues regarding high levels of phosphates which are partly due to domestic STW.	which may discharge into this water course and have not been assessed in terms of capacity risk. Existing water quality problems are also due to agricultural run-off.	development will be important in avoiding adverse effects. Need to ensure adequate infrastructure is in place prior to allocating development that may discharge into the River Mease. Cannot assume No AEOI. Suitable mitigation policies are needed within the RSS to ensure localised issues are dealt with and to ensure No AEOI.
River Wye SAC	Adverse effects on integrity possible. The condition of the site is considered to be currently effected by sewage discharges, the existing STWs will have difficulties in accommodating additional growth and 16,600 additional homes	Conclusion on AEOI. Gone through to stage 4 for WQ issues. Rotherwas STW is by far the largest in the Wye catchment and causes significant increases in BOD and AMM leading to marginal failures of the targets.	Moreton on Lugg STW – Medium Risk Rotherwas STW – high risk.	NE concerned due to current situation and difficulties of meeting new limits and accommodating growth. EAW agree with Welsh Water. Their position is	The failure of the P target in the Lugg catchment is caused by a combination of point source and diffuse inputs in the ratio of circa 50:50 as measured at the end of the catchment. [51] Issues regarding	There are problems regarding high phosphate levels on the Lugg. Welsh Water has stated clearly that the quantity of growth proposed in Herefordshire (through the RSS PO and the NLP Scenarios) and is not a problem. EAW support this view that there will be no problem accommodating the quantity of housing proposed

[51] Environment Agency (2008) Appropriate Assessment for the River Wye SAC SE Area Review of Consents: Stage 3

European site	Conclusions from HRA of the RSS Phase Two Revision (2007)	Findings of Roc	Capacity risk of STW	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS phase two PO and NLP study
	are planned for Herefordshire. Habitats Directive Review is currently being undertaken by the EA for this site and decision should be reviewed when the results are available.			that at this strategic scale they see no problems accommodating total growth but There are specific localised issues that need to be tackled lower down in the planning hierarchy.	flow likely to be working in combination with water quality to produce AEOI. The life cycle of the Wye SAC migratory fish species is linked to the WQ of the Severn estuary through which they pass before entering the Wye estuary. See below.	but there may be some locational issues'[52]. Policies with the RSS will need to make clear that any specific local issues are tackled through the LDF process. With strong mitigation policies in place (see recommendations) we can conclude 'no AEOI".
Severn Estuary cSAC (now SCI) & Ramsar	Impossible to conclude there will not be an adverse affect due to the risks identified in the EA technical paper Habitats Directive Review is currently being undertaken by the EA for these sites and decision should be reviewed when the results are available.	RoC process has gone through to stage 3. The conclusions are not available but the EA has informed us that based on the assessment there are no environmental issues in the Severn Estuary which are attributable to domestic discharges with the River Severn freshwater catchment[53].	Multiple STWs at medium or high risk in Severn Catchment	The West Midlands region will not affect the water quality in the Severn Estuary. The EA operates a "no deterioration policy". Although there may be selective	Threats identified that contribute to turbidity/ siltation, change in oxygenation and eutrophication and toxic contamination include coastal defences, coastal farming, ports, dredging, aggregate extraction, nuclear power generation,	Although the RoC conclusions are not available the EA have stated that the West Midlands region does not have an adverse effect on quality of the water reaching the Severn Estuary sites and will continue to operate a strict 'no deterioration policy'. However, the SCI and Ramsar are in part designated for migratory species that may use the full reaches of the River. So despite this assurance the future capacity

[52] Mark Squire, Environment Agency (2009) pers comm

[53] Environment Agency (2009) Per Comm. Email received 27th March 2009

European site	Conclusions from HRA of the RSS Phase Two Revision (2007)	Findings of Roc	Capacity risk of STW	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS phase two PO and NLP study
		In addition, River Wye Stage 3 report states "*the water quality of the Severn Estuary was assessed for a range of metals, organic compounds (PCBs, PAHs and pesticides) and nutrients. Levels of metals were consistently below the relevant Environmental Quality Standards while organics were generally below limits of detection. Although nutrients may be high compared to national data this is not an issue in the Severn due to the natural high turbidity of the system. Generally, no spatial patterns were evident in the data with material (where detected) distributed evenly throughout the estuary. These data provide no evidence that water*		localised quality issues regarding sites within the region these will be compensated for by stricter quality requirements elsewhere. The load (volume x concentration) form the West Midlands region will not increase.	shipping, industrial effluent, runoff, sewage, shipping waste, and spoil dumping. Localised discharges on the Estuary itself are thought to be having an adverse effect and are likely to be the target of RoC measures.	risks in areas including *inter alia* Bromsgrove, Solihull and the Black Country may lead to adverse effects on the designated features. What is still needed is an understanding of the capacity left in the River and Estuary to accommodate further sewage loadings without adverse effects on the site and what this means in terms of new development that can be accommodated in the region. This should take into account the expected increase in hard paved areas the increase of surface water and sewerage flooding events. Until this is clearly understood the recommendations set out in Section 7 need to be applied to conclude no AEOI.

[54] Environment Agency (2008) Appropriate Assessment for the River Wye SAC SE Area Review of Consents: Stage 3

European site	Conclusions from HRA of the RSS Phase Two Revision (2007)	Findings of Roc	Capacity risk of STW	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS phase two PO and NLP study
		quality would adversely affect the passage of salmon or other migratory species"[54].				
Severn Estuary SPA	Phase Two unlikely to affect integrity of site (alone or in combination). The plan is not considered likely to affect invertebrate communities, or bird populations directly through changes in water quality. Habitats Directive Review is currently being undertaken by the EA for this site and decision should be reviewed when the results are available.	RoC process has gone through to stage 3 following a finding of likely significant effect but the conclusions are not available yet.	Multiple STW at medium or high risk in Severn Catchment.	The West Midlands region will not affect the water quality in the Severn Estuary. The EA operates a "no deterioration policy". Although there may be selective localised quality issues regarding sites within the region the these will be compensated for by stricter quality requirements elsewhere. The load (volume x concentration) form the West	Other threats identified include beach replenishment, dredging, aggregate extraction, recreational boating, coastal farming, shipping, industrial effluent, runoff, sewage, shipping waste, spoil dumping.	Although the RoC conclusions are not available the EA have stated that the West Midlands region does not have an adverse effect on quality of the water reaching the Severn Estuary sites and operates a strict 'no deterioration policy' and that any future concerns relate to localised issues of accommodating growth in areas where capacities of STW are tight. As the Environment Agency will apply compensation measures in these cases to ensure the sewage load reaching the estuary does not increase, the water quality at the Estuary itself is unlikely to be affected by domestic discharges in the West Midlands. Ultimately the freshwater flows in the channels and creeks in the Estuary on which the birds may prefer to feed, drink, bathe or preen are again unlikely to be affected by discharges in the West Midlands region. We would like to conclude No AEOI but we haven't seen the findings from the

European site	Conclusions from HRA of the RSS Phase Two Revision (2007)	Findings of Roc	Capacity risk of STW	EA's / NE/ CCW comments	Other Plans & projects	Risk to site integrity from RSS phase two PO and NLP study
				Midlands region will not increase.		RoC or an assessment of the capacity in the estuary to receive higher levels of ammonia or BoD. Therefore there is still some uncertainly that any increase relates to future growth in the Estuary wouldn't act in combination to have an adverse effect.

7 Recommendations

7.1 General

There needs to be ongoing, concerted action to understand specific capacity constraints relating to water resources and wastewater treatment in relation to planned increases in housing and the associated risks to European sites. There is an increasing risk of adverse effects on sites in future due to pressure on water supplies, together with associated effects of reduced water supply on water quality (e.g. through concentration of pollutants in smaller volumes of water). There will be an increasing need for stronger integrated approaches to ensure that water supplies can be assured for planned levels of development without implications for any European Site. Incompatibility of timescales of RoC processes, WRMP production and regional planning has made it very difficult to obtain the information required to reach reliable conclusions through HRA or to reach certainty that final proposed housing numbers have been appraised.

Conclusions regarding proposed levels of development in the West Midlands RSS and water resource and quality issues relating to European Sites are set out below. Recommendations to address any residual uncertainty are given. These conclusions and recommendations apply to the RSS Phase Two preferred option and the NLP scenarios unless specifically indicated.

7.2 Water resources

The maintenance of appropriate water levels is an important factor in maintaining the integrity of a large number of European sites. Abstraction of water from rivers, lakes and ground waters has the potential to reduce water inputs to and flows in European sites. Reduced flows may have an adverse impact on the interest features for which the sites are designated with possible implications for the integrity of sites as a whole.

Discussions with the Environment Agency, Natural England and Severn Trent Water, South Staffordshire Water and Welsh Water suggest that predicted future water needs associated with current planned levels of development can probably be met without significant adverse effects on European sites. However, there are some sites for which there is residual uncertainty depending on spatial location and other factors as outlined below.

Based on the HRA and subsequent consultation and assessment as outlined in this report, a finding of No Adverse Effect on Integrity can be concluded for the River Dee and Bala Lake SAC, River Mease SAC, and the River Usk SAC.

The River Wye is an important source of public water supply as well as being designated as a European Site. For the River Wye SAC it is possible to conclude that there will not be an adverse effect on integrity from the quantum of growth proposed in the West Midlands RSS, but specific locational issues remain in Herefordshire that need to be tackled through RSS policy to avoid adverse effects. In particular, the ability to provide both existing and new customers in the Pilleth WRZ (covers very small area of Herefordshire) will be affected by the sustainability reductions that are needed.

For the Severn Estuary SCI, SPA, Ramsar, the Statement of Response does not contain any specific options that are expected to increase pressure on the Severn WRZ, but further information is needed to conclude no AEOI. This is largely due to the uncertainty associated with the RoC process, the findings of ‘no water available’

from the CAMS and the complexity of in-combination impacts in a system as large as this. Severn Trent Water is preparing a WFD/RSA Sensitivity Analysis which will be made available to the statutory nature conservation bodies to provide robust assurance that the sustainability reductions can be accommodated. Until the RoC conclusions and RSA information is made available, however, it is necessary to include precautionary policy in order to conclude no AEOI.

It is therefore recommended that the RSS should include the following requirements to ensure no AEOI on the River Wye SAC and Severn Estuary sites:

a) A requirement for Local Authorities (particularly Herefordshire) to engage in early consultation with Water Companies and the Environment Agency on site allocations to ensure development is located in WRZs where there is surplus water available after the required sustainability reductions. Mandatory water cycle studies would demonstrate this.

b). A requirement to avoid any development within the Pilleth WRZ which increases the total demand for water

c). A commitment to be enshrined in the LDFs that development must be conditional on assured water supplies from sources that would not have an adverse effect on European sites.

In addition, considering the concerns raised by the EA with respect to locating a high proportion of housing in the River Severn Water Resource Zone (especially under the NLP options) it is prudent to continue to support the water conservation and efficiency measures set in policy SR3 of the draft RSS.

Future critical review of this issue and of the Water Resources Management Plan will be necessary, for four reasons:

- the Water Resources Management Plans will be revised and finalised during 2009;
- Severn Trent Water has now committed to undertake a HRA of their WRMP;
- the assumptions upon which the Plan is based (particularly with respect to future water efficiencies and water metering levels) may require revision;
- future housing growth and other development figures – both within the RSS and in other regions – may challenge the conclusions in the Water Resources Management Plans.

It is likely that, at least for the Severn Estuary sites, the gaps in information will be filled before the Secretary of State reaches the process of adopting the plan. There should be opportunity for consideration of RoC conclusions and FWRMP during the period of Proposed Changes and an opportunity to a replace more the precautionary approach with definite policies.

7.3 Water quality

As indicated by the findings of the RoC process many European sites are already adversely affected by poor water quality, from a range of sources including agricultural run-off, urban run-off, discharges from wastewater treatment works and leachate from contaminated land.

Based on the HRA and subsequent consultation and assessment as outlined in this report, a finding of No Adverse Effect on Integrity can be concluded for the Pasturefield Saltmarsh. We are unable to conclude no AEOI for the River Mease SAC, River Wye SAC, and Severn Estuary SCI, SPA and Ramsar. This relates to the

conclusions of the Roc process in combination with the lack of clarify with specific capacity constraints at individual wastewater treatment works and drainage area networks and the lack of understanding of capacity left in the Severn Estuary sites.

There is still a lack of information regarding future water infrastructure needs in relation to water quality, though the EA reports seeing a lot more water cycle studies being produced by local authorities[55]. The following actions are recommended to support the ongoing development of the RSS:

- A comprehensive update of the EA technical paper by the EA to re-examine the implications of planned development with respect to pressure on sewage treatment works and to identify any European sites which could be adversely affected in light of the recent RoC progress.
- Ongoing, concerted action to develop an approach to clarify specific capacity constraints around individual wastewater treatment works and drainage area networks, in relation to projected housing and other development. Clearer understanding of such constraints, coupled with clarification of the relationship between particular wastewater treatment works and drainage area networks and individual European sites, would facilitate the identification of areas where development might give rise to adverse effects.

In the absence of a clear strategic understanding of the relationship between the potential impacts of housing and development growth on water quality a precautionary approach will have to be taken within the regional HRA process. The RSS should:

a) Require water cycle studies to be mandatory for all areas where likely significant effects on a European site are possible and these should include a Surface Water Management Plans.

b) Require local authorities to link delivery of housing with review of the capacity of STWs and the sewerage network and plan improvements to these as necessary to ensure that water quality at European Sites is not compromised. Those Local authorities with European Sites that could be at risk need to adopt a precautionary approach to development and must test plan alternatives.

c) Reinforce the need for more detailed assessment at a local level and include a policy allowing a lower housing allocation where it is the only effective mitigation to ensure no adverse effect on the integrity of European sites.

In addition, in many areas, excessive surface water flows to drains create most of the significant flooding and water quality incidents. The RSS already supports sustainable drainage systems but further consideration should be given to strengthening the RSS in this regard.

[55] West Midlands RSS Water issues meeting, Sapphire East, 26th Jan 09

8 Glossary

Annex I habitat:	Habitat listed in Annex I of the EU Habitats directive.
Annex II species:	Species listed in Annex II of the EU habitats directive.
Appropriate Assessment (AA):	See Habitats Regulation Assessment.
Birds Directive:	EU Directive 79/409/EEC on the conservation of wild birds[56]. Implemented in the UK by the Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats &c) Regulations 1994 (as amended)[57].
Catchment Flood Management Plan (CFMP):	An Environment Agency document, setting out proposed policies for dealing with catchment flooding. Available through the Environment Agency's local offices.
Conservation objectives:	A statement of the nature conservation aspirations for a site, expressed in terms of the favourable condition required for the habitats and / or species for which the site was selected.
European site:	See Natura 2000 site.
Favourable condition:	Designated land is adequately conserved and is meeting its 'conservation objectives', however, there is scope for enhancement.
Habitats Directive:	EU Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna[58]. Implemented in the UK by the Habitats Regulations 1994.
Habitats Regulations:	Formally known as the Conservation (Natural Habitats, & c.) Regulations 1994[59]. These transpose the requirements of the Habitats Directive into domestic legislation.
Habitats Regulations Assessment (HRA):	Previously known as Appropriate Assessment, AA. An assessment of the effects of a plan or project on the Natura 2000 network. The network comprises Special Protection Areas under the Birds Directive and Special Areas of Conservation under the Habitats Directive (collectively referred to as European sites)
In combination:	The cumulative effects caused by the project or plan that is currently under consideration together with the effects of any existing or proposed projects or plans.
Natura 2000 site:	Collective term for SAC and SPA sites. PPS9 also recommends that Ramsar sites should be afforded the same level of consideration as SPAs and SACs, in policy if not in law. To avoid potential challenge, Ramsar sites should thus also be subject to AA where

[56] Text of the Directive and background information can be found at http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

[57] Further information on the JNCC website at http://www.jncc.gov.uk/page-1373

[58] Text of the Directive and background information can be found at http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

[59] Further information on the JNCC website at http://www.jncc.gov.uk/page-1374

	relevant. In many cases the reasons for Ramsar designation overlap the SAC and SPA designations.
Ramsar site:	Sites designated as internationally important wetland habitats under the International Convention on Wetlands of International Importance (1976) (Ramsar Convention).
Review of Consents (RoC):	Environment Agency document reviewing consented actions that may affect a Natura 2000 site.
Special Area of Conservation (SPA):	Site of European importance for nature conservation designated under the Conservation of Natural Habitats and Wild Flora and Fauna Directive (92/43/EEC).
Site of Community Importance (SCI):	Site of European importance that has been adopted by the European Commission *but not yet* formally designated by the government of each country.
Special Protection Area (SPA):	Site of European importance for nature conservation designated under the Conservation of Wild Birds Directive (70/409/EEC).
Site of Special Scientific Interest (SSSI):	UK national designation identified under the Wildlife and Countryside Act (1981) as being important for wildlife and/or geology. Over half of these sites, by area, are internationally important for their wildlife, underpinning the network of Natura 2000 sites, designated as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites.
Sustainability Reductions	The Environment Agency can reduce the amount of water that is permitted for abstraction from the ground and rivers to protect some sensitive environments. These are called Sustainability reductions.
Water Level Management Plan (WLMP):	Water Level Management Plan. An Environment Agency document, which sets out site-level plans for water-level management.

9 Abbreviations

AEOI	Adverse Effect on Integrity
ASR	Aquifer Storage Recovery
CCW	Countryside Council for Wales
EA	Environment Agency
EAW	Environment Agency Wales
GOWM	Government Office West Midlands
HRA	Habitats Regulations Assessment
LSE	Likely Significant Effect
NE	Natural England
SEA	Strategic Environmental Assessment
STW	Sewage Treatment Works
RSA	Restoring Sustainable Abstraction
WMRA	West Midlands Regional Assembly
WRMP	Water Resource Management Plan
WRMU	Water Resource Management Units
WRZ	Water Resources Zone

10References

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Environment Agency (2009) Pers Comm. Email on 11th March

Environment Agency (2009) Pers Comm. Email received on 20th March

Environment Agency (2009) Per Comm. Email received 27th March 2009

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Hyder (February 2008) Welsh Water, Water Resources Management Plan Strategic Environmental Assessment, Environmental Report

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Severn Trent Water (Feb 09) Draft Water Resources Management Plan - Statement of Response

South Staffordshire draft Water Resources Management Plan March 2008

South Staffordshire draft Water Resources Management Plan SEA March 2008

South Staffs Water (26th January 2009). Email to Natural England following absence at the water issues meeting in Solihull.

Welsh Water Draft Water Resources Management Plan, March 2008

Welsh Water Draft Water Resources Management Plan SEA Report, March 2008

Welsh Water Water Resources Management Plan Draft Habitats Regulations Assessment 23rd January 2009

Welsh Water (2009) added as corrections to the draft report on 12th March 2009

Appendix A – Meeting notes

West Midlands RSS Water Issues Meeting

26th January 2009

Sapphire East, Solihull

Attended by:

Maurice Barlow (RA) Chris Blakely (RA) Orlando Venn (TC) John Martin (STW Water quality issues) Matthew Foster (STW – water supply issues) Kelly….? (EA) Marion Hinton (EA) (EA) Alison Williams (EA strategic water resource planner) Damon Llewellyn (EA – water quality issues)

Apologies

Gail Davies (WW)

Marcus O'Kane (STW – responsible for production of WRMP)

Alison Brown (CCW)

Meeting Summary

1. Is STW doing an HRA?

Severn Trent Water (STW) not doing HRA of WRMP.

April 09 – publication of the final draft of WRMP.

Helen Wake has greatest concern with Ombersely WTW as a way to provide more water from the River Severn.

2020 – Date at which Ombersely WTW would need to be brought on board

2. What is the WRMP based on?

Have used numbers from RSS preferred option.

STW - NLP options wasn't addressed but the NLP wont have a material impact on the ability to provide water resources from the region.

CB - Some of phs 3 policies may filter into phs 2 revision to ensure no impact on European sites during EiP process.

OV – raised the issues that were brought up by water companies concerning difficulties in ensuring rivers are regulated to provide adequate protection:

Matthew Foster (STW) replied

- That the delays in the delivering the resources allocated in AMP 4 were no longer there.
- Regarding Ofwat – the pressure is still there to meet low economic cost
- Concerns regarding front loading should have elapsed due to current economic crisis.

Only one option "Ombersely" – draws on River Severn and is of concern to NE and EA.

Need alternatives to this in the WRMP in case this cant be brought on board due to HRA constraints.

Note - Possible mitigation measure (failing alternatives) is to require that before demand increases so that is necessary that this scheme is assessed

OV - Question – what housing numbers will force a need to draw down on sources that may lead to an adverse effect on European sites?

STW needs to assess this – will consider the new housing numbers from NLP. OV to consult further with STW.

EA (Alison Williams) – EA haven't worked out the final flow factor for the Severn Estuary SAC, SPA, Ramsar so cant do a precise HRA study.

CB – there is a Technical meeting on the March 18th so it would be helpful for STW to provide all addition information on alternatives to Ombersley, and any HRA work, critical housing figures by this date.

Ian Smith – representation needed from STW for panel

3). CWW want clarification regarding the abstractions from the Elan system.

STW - STW has no plans to increase abstraction from Elan Valley or the Mitcheldean Water Treatment Works on the Wye. Don't see why CCW are concerned.

Alison Williams (EA) –does not see any problems with the SWT abstraction. Note Welsh Water owns the abstraction and leases a certain part to Welsh Water not the other way round!

May be 'in combination effects' between Dwr Cymru and Severn Trent's WRMP. STW need to reconsider plan in light of release of the Dwr Cymru WRMP.

WATER QUALITY

Need to see the EA spreadsheet and submission - OV to request from Damon Llewellyn.

STW needs to look at headroom available at certain European sites. Need to liaise with STW to check numbers.

A lot of Local authorities are producing water cycle studies. EA has now produced guidance on undertaking these studies. Good news – suggested in HRA report for Phase II revision.

Helen Wake most concerned with the River Mease SAC.

Helen would like "water cycle studies" mandatory policy for all areas where "likely significant effect".

Question to be resolved:

Can the rivers handle additional flow, additional load or can the sewage treatment works be upgraded?

West Midlands RSS/Wales Water Issues/HRA Meeting

10th February 2009

Conference Call

Attended by:

Chris Blakeley (WMRA/LGA)

Helen Wake NE

Caroline Saunders EA Wales

Orlando Venn TEC

Janet Sawyer GOWM

Joanne Smith WAG

Mark Squire EAW (WQ)

Laurence Price EA Midlands

Jim Davies EA Midlands

Gail Davies DCWW

Ian Smith GOWM

Apologies:

Alison Brown (CCW)

Herefordshire

Meeting Notes

	Summary of Key Points	Action
1.	**Questions from HW** Do the levels of changes that the EA are proposing under the Habitats Directive Review of Consents (assuming that this is the worst case) mean that Welsh Water would have trouble supplying water for the level of growth in the RSS phase 2 Preferred Option, and the NLP housing study numbers? GD: The Welsh Water dWRMP does not take into account the sustainability reductions as definitive sustainability reductions were not available before the dWRMP was submitted in March 2008. However the likely outcomes of the RoC process have been considered and Welsh Water believe they will still be able to supply the water required within the plan period (with no adverse impact on European sites). The dWRMP is based on the housing figures set out in the Phase 2 Preferred Options (830 households/yr) for Herefordshire Council but it is also applicable for the housing numbers set out in the NLP study (890 homes/yr). IS: the extra homes for Herefordshire are the same for each scenario	

	presented in the NLP study. GD: The big issue is where the development is planned.. Distribution of development is more important than the numbers as the balance of supply is not the same across all the WRZs in Herefordshire. Welsh Water have taken the assumptions that 50% of housing will be located in Hereford and 50% in rural locations in line with the draft RSS Phase 2 submission. IS: Phase Two housing figures already include growth point numbers. GD: there isn't much additional supply in any of the zones but the Pilleth WRZ will be a particular problem. This WRZ relies on one bore hole licence and any reductions required from the RoC process will be a problem here. A 1.6 Ml/d reduction is likely to be required at Pilleth and this represents a large proportion of the total supply (3 Ml/d) for Pilleth. GD: Growth can be accommodated within other water resource zones. Seasonal reductions will be required at Broomy Hill which supplies 4 WRZs but there is headroom within the licence to accommodate the reductions without affecting current abstractions and without affecting planned growth under the RSS Phase 2 and the NLP scenarios. HW: If large reductions in abstractions from the River Wye are needed this wont affect the ability to deliver the options proposed and to be able to provide for growth? GD – Yes. GD: The EA sustainability reductions are the really challenge to be met. This will occur regardless of the additional growth. The growth in demand from households is not a problem compared to the extent of the sustainability reductions GD: For Pilleth WRZ options include Bankside storage or a long transfer from the Wye. Both would be problematic but only a small % of the Pilleth WRZ lies within Herefordshire Council so its not a significant issue for the level of growth proposed in West Midlands RSS Phase 2 . CB: So growth can be accommodated in the areas served by Welsh Water as a whole but there are just some locational issues – It depends where it's distributed and this is a LDF type matter. There is a opportunity to include some mitigation policy perhaps within SR4 so that it covers water resources as well as air quality. This issue needs to be appropriately addressed through core strategies and area action plans by Herefordshire, the role of the RSS is to identify the issues and perhaps include policy . To sum up: Headroom is available within all zones apart from Pilleth WRZ which only a small part lies within the region. This can be addressed without adverse	

	effects on a European sites in Wales and England.	
2.	**Other water resource issues** **The transfer from the Wye to the Usk** CS/LP: The abstraction and transfer from the Wye to the Usk is on the downstream end of the River Wye past Monmouth. The abstraction from the Wye which feeds Herefordshire is at Broomy Hill in the upper reaches of the Wye. The Review of Consents is worked out and based on fully licensed abstractions. The abstraction for the transfer will not be affected by proposed growth in Herefordshire. GD: This Wye/Usk is of no relevance to the HRA for the West Midlands RSS. The flows in the Usk will not be affected by growth in the West Midlands Region. **Vowchurch WRZ** OV: Noticed that Vowchurch was highlighted with some uncertainly in the dWRMP. Is there any concern that there won't be enough headroom after sustainability reductions to deliver the options to deal with the predicted deficit? GD: No	
3.	**Water Quality** HW: With the reductions planned is there any headroom to accommodate the predicted growth. MS: The EA RoC Process assesses the maximum licences. The current capacity is not near the total. There will be no problem in accommodating the proposed level growth both in the RSS Phase 2 prposals and the NLP study. HW: Concentrations being discharged are currently affecting certain sites. Will WW be able to meet new limits and also accommodate growth? GD: improvements to WWTW do not need the same sort of lead in time and planning as water resources.	

	HW: There is a need to explore and demonstrate that there will not be a problem in future with the levels of proposed growth. OV: Is there an update to the EA technical paper in 2007 examining the Phase Two PO and NLP study housing options? Orlando to send Mark Squire copy of technical paper and specific questions MS: I will produce an update looking at the WW situation by the 27th February.	OV MS
4.	**AOB:** The panel needs to contact Water Companies with invitations to technical meetings further in advance. CB/IS to advise CCW (AB) and work with partners to prepare for 18th March Technical Seminar	CB /IS

Water Issues/HRA Meeting

25th February 2009

Conference Call

Attended by:

Chris Blakeley (WMRA/LGA)

Orlando Venn TEC

Alison Brown (CCW) – comments added in red below

Rachael Pipkin (GOWM)

Victoria Meikle (GOWM)

Meeting Notes

	Summary of Key Points	Action
1.	As suggested by CB the meeting focused on the notes from the conference call on the 10th February. OV: Made reference to the meeting on the 26th January with Severn Trent Water and the meeting held on the 24th February on the statement of response and the SEA. The Statement of response changes all the options and presents a different supply and demand forecast. Severn Trent are confident that they have enough headroom to accommodate growth whilst protecting European sites AB: hasn't seen the meeting notes or heard back from her colleague but spoke to STW last week and has concerns over their proposed options that increase abstraction for the lower Wye and change the regime at Elan. CCW would disagree with the use of the word options. When ST contacted me possible changes to their WRMP in respect of the Lower Wye and the Elan system were mentioned. CCW do not know what these changes will beor whether they will be significant. ST will be making amendmends to their SEA and will be undertaking HRA on their WRMP AB has a con call/meeting with STW on the 6th March. She will check if OV is able to join this meeting. AB: With regards the meeting with Welsh water has concerns about the statement (recorded in meeting minutes) allegedly made by Gail Davies that information on required sustainability reductions are not available. AB stated these are available. CB/OV: Welsh Water is aware of the magnitude of change required and are confidential they can accommodate the sustainability reductions, provide for growth without having an adverse effect on European sites. AB: Uncertain this can be done. WW need to prove that they are capable of accommodating the sustainability abstractions required. CCW is not so much 'uncertain' as to whether this could be done but would require certainty that there would be no adverse effects on European sites OV: will contact Gail Davies to see if she can provide data to	AB

	support statements	OV
2.	Questions still remain regarding the format of the technical seminar and what is expected. CB: the panel will want to know what are the issues that we can't reach agreement on. Hopefully these conversions will help resolve most of the outstanding issues. CB: GO have received letter from Brown Jacobson lawyers. This is public so CB will sent around this group so everyone is familiar with CCW concerns	CB
3.	Issue 2 of the meeting on the 10th Feb: transfer from Usk to Wye AB: still concerned that the Usk SAC may be affected if WW are required by the RoC process to reduce the abstraction for this transfer. Does not think that this is an issue for the West Midlands RSS but uncertain about this. Disagree. As above, in respect of the Habs Directive, CCW must have robust assurance/degree of certainty that there will be no adverse effects on European sites, given CCW's concerns regarding the RoC, it may be that we need more reassurance on this issue	
4	Water quality AB: this is more of an issue for NE. CCW would only be concerned about the Severn Estuary sites and the water quality is more of a diffuse issue by this point. Disagree. CCW would also have concerns about water quality issues in the Lower Wye. Our comment yesterday was in respect to NE's concerns with point source pollution	
5	Alison is meeting with Welsh Water and Herefordshire CC and will feed back meeting notes from these meetings.	AB