

# **Water Cycle Study - Addendum**

**Amended to incorporate  
Environment Agency comments**

**February 2015**

## **Herefordshire Local Plan – Core Strategy**

### **Water Cycle Study Addendum**

#### **Herefordshire Local Plan – Core Strategy context**

Following several stages of production and consultation, the Core Strategy was submitted to the Secretary of State in September 2015 and the document is currently subject to an Examination in Public.

The Core Strategy sets out the strategic spatial strategy for Herefordshire. It proposes a strategy identifying the level of development expected to take place in the County and its broad distribution for the period up to 2031.

A water cycle study was prepared on by Brian Faulkner on behalf of Herefordshire Council in 2009. This study helped to inform preparation of the Core Strategy. It is recognised that a number elements of the Water Cycle work are in need of updating, particularly in respect of assessing the outcomes of recent work undertaken by the Environment Agency and Natural England in producing a Nutrient Management Plan for the River Wye Special Area of Conservation. This document is therefore an addendum to the original Water Cycle Study and provides up to date water cycle evidence. In particular it provides an assessment of the impact of growth on permits upon sewage treatment works in Herefordshire and has been produced with information provided by the Environment Agency.

#### **1. The Nutrient Management Plan**

The River Wye SAC Nutrient Management Plan (NMP) has been jointly developed by the Environment Agency (EA) and Natural England (NE). It has been produced in consultation with the major stakeholders particularly Welsh Water (DCWW), Powys County Council, and Natural Resources Wales and the National Farmers Union (NFU). The plan will be supported by both a Nutrient Management Board that will oversee the strategic direction of the plan and a Local Implementation Group that will lead on delivery of the measures under the umbrella of the Catchment Partnership. The measures and actions contained within the plan will implement high level objectives set out in the Severn River Basin Management Plan.

The Evidence base and options appraisal section of the NMP was produced and published in May 2014. Using industry standard source apportionment models it predicts the likely impact that growth in Herefordshire and Powys will have on the SAC in terms of phosphate and presents a range of solutions to reduce phosphates to the required levels. The first version of an Action Plan was published in November 2014. In the introduction to the Action Plan it is clearly stated that the NMP is designed to enable the desired economic growth in Herefordshire whilst achieving and maintaining Favourable Condition Status for the Rivers Wye and Lugg SSSI that form the River Wye SAC As such this document is intended to support and be read in conjunction with the Core Strategy for Herefordshire.

#### **2. The implications of growth proposed in the Core Strategy**

The table attached in Appendix 1 has been prepared by the Environment Agency in consultation with Welsh Water. It sets out the assessment of the impact of the levels of

growth proposed in the Core Strategy upon water quality at the sewage works. It divides the sewage works into different categories Towns, Rural and Small Rural. It provides a broad assessment to indicate works which are likely to be able accept the proposed growth within current limits, where there is some uncertainty regarding whether the works can currently accept the proposed level of growth and areas where the level of growth cannot be accommodated by the current permit. Further consultation is required with Severn Trent Water Ltd who provides sewage to a small number of settlements in Herefordshire.

The following commentary provides an assessment and review of the implications against the Core Strategy growth proposals for Hereford, each of the market towns and the rural area.

- a. Hereford – some 6500 new dwellings are proposed in the Core Strategy including strategic housing proposals at Holmer (500 dwellings), Three Elms (1000 dwellings), Lower Bullingham (1000 dwellings) and the Urban Village (800 dwellings). Rotherwas Enterprise Zone is also served by one of the City's (Rotherwas) treatment works. Strategic housing proposals include requirements to include sustainable urban drainage systems.

STW – Water quality assessment – Hereford is served by two STWs (Eign and Rotherwas). The assessment indicates that at the Eign works there is capacity in the order of 1173 dwellings, it concludes that accepting 40% of Hereford growth could potentially cause the flow limit to be exceeded, based on adding growth to the highest measured flows.

Rotherwas has potential to accept around 5700 dwellings so could potentially accommodate 60% of the planned Hereford growth within current flow limits.

However, the assessment makes clear that the STW cannot be considered in isolation as the inlet is combined with Eign. Considering the two STW combined there is capacity to accept the growth. Monitoring would be required throughout the plan period as well as on going liaison with Welsh Water. Phosphate issues will also be considered through NMP actions and the Water Companies Asset Management Plan (AMP6/7) planning under the Water Framework Directive. The River Wye is currently achieving favourable Condition Status and it is anticipated that the short term growth plans would not cause a failure of that target. However the SAC will be closely monitored and, if necessary, development phased accordingly should a risk occur.

#### DCWW Comment

Major STWs which see significant capital expenditure in every AMP period. Need for AMP7 scheme (including potential P removal for NMP). An infiltration reduction scheme (~£1m), included in AMP6 programme (2018), should reduce flows to the STW if successful, partially offsetting increases due to growth.

Therefore, given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of housing (including the strategic site) in Hereford, in the five year period (2014-19) or over the longer plan period.

- b. Leominster – the Core Strategy proposes some 2300 new dwellings for Leominster over the plan period up to 2031, 1500 of these dwellings are proposed as part of an urban extension. The proposal for the urban extension includes requirements for a sustainable urban drainage system incorporating measures such as rain gardens and swales to manage ground and surface water drainage.

STW Water quality assessment - The assessment demonstrates that there is limited capacity and that to achieve the total level of growth proposed in the Core Strategy would require a new permit. However there is current capacity for around 1,600 dwellings. In respect of the Core Strategy anticipated trajectory this would provide in excess of 10 years supply of housing in Leominster.

The assessment includes an indication of the quality limits that could be required to achieve no deterioration and Water Framework Directive (WFD) targets, potential phosphate limits that could be required as part of the catchment solution for favourable condition are included in the NMP. The NMP phosphate modelling suggests that a limit of 0.1mg/l could be required as part of the catchment solution to achieve favourable condition status. Welsh Water as part of a national water company series of trials in AMP6 is committed to testing a range of possible options in order to determine the most appropriate option for removing phosphate (beyond currently achievable limits) to achieve the required targets. As trials are not yet completed the actual works (and costs) required for this level of phosphate reduction are unknown. Leominster STW already has a phosphate permit limit of 1mg/l and this limit can be routinely achieved in the UK, it is acknowledged that a limit of 0.5mg/l can be achieved with current technology. A solution to achieve a potential 0.1mg/l phosphate limit at Leominster will depend on future investment for the water industry through the Periodic Review process and trials being carried out during the Asset Management Plan 6 period (2016-2020) to determine the most effective enhanced treatment regimes.

In addition other measures brought forward through the Nutrient Management Plan actions are also anticipated to impact upon phosphate levels in the plan period which may reduce the amount of phosphate stripping required at the Leominster sewage treatment works.

#### DCWW Comment

Full Core Strategy growth, i.e. 20yrs. is likely to trigger need for increased DWF permit, with likely sanitary consent tightening. Growth to 2020 unlikely to breach flow limit but will need to review need for AMP7 scheme at PR19. It would be appropriate to integrate growth, quality (P-removal), and maintenance requirements into a potential AMP7 scheme. A flow reduction scheme has been included in our AMP6 programme to try and reduce infiltration in the sewerage network.

Given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of housing (including the strategic site) in Leominster, in the five year period (2014-19) or over the longer plan period

- c. Ledbury – The Core Strategy proposes a target of 800 new dwellings for Ledbury including a strategic housing proposal of 625 dwellings. The proposal for the strategic site includes requirements for a sustainable urban drainage system incorporating measures such as rain gardens and swales to manage ground and surface water drainage.

STW – Water quality assessment - Ledbury is not located in the catchment of the River Wye SAC so the NMP Actions will not apply to this STW. The assessment indicates that with an estimated capacity of 2760 dwellings the proposed growth can potentially be accepted within the current flow limit. The issue of phosphates will be considered as part of AMP6/7 in planning to meet the requirements of the Water Framework Directive.

Given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of housing (including the strategic site) in Ledbury, in the five year period (2014-19) or over the longer plan period.

- d. Ross-on-Wye – At Ross-on-Wye there is a target of 900 new dwellings with a strategic housing site proposal of around 200 dwellings. The proposal for the strategic site includes requirements for a sustainable urban drainage system incorporating measures such as rain gardens and swales to manage ground and surface water drainage

STW – Water quality assessment - Although located adjacent to the River Wye SAC the level of phosphate is not an issue which is causing concern in Ross-on-Wye, and NMP actions are unlikely to be required. The assessment indicates that the Core Strategy growth can potentially be accepted. However, the STW flow could be within 10% of the permit. Monitoring would be required throughout the plan period. The issue of phosphates will be considered as part of AMP6/7 in planning to meet the requirements of the Water Framework Directive.

#### DCWW Comment

DCWW have indicated that there is a Growth scheme (~£3.5m) included in the AMP6 capital programme for completion by 2020. Design horizon ~ 2035 which will accommodate core strategy growth.

Given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of housing (including the strategic site) in Ross-on-Wye, in the five year period (2014-19) or over the longer plan period.

- e. Bromyard – Core strategy proposals for Bromyard include a housing target of 500 dwellings with a strategic housing proposal for around 250 dwellings. The proposal for the strategic site includes requirements for a sustainable urban drainage system incorporating measures such as rain gardens and swales to manage ground and surface water drainage.

STW – Water quality assessment - The assessment indicates that with the proposed Core Strategy growth the STW flow could be within 10% of the permit. Therefore, it will be important to continue to monitor the position throughout the plan

period. The issue of phosphates will be considered as part of NMP actions and through AMP6/7 in planning to meet the requirements of the Water Framework Directive.

#### DCWW Comment

A growth scheme (~£3.5m) included in the AMP6 capital programme for completion by 2020. Design horizon ~ 2035 which will accommodate core strategy growth.

Given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of housing (including the strategic site) in Bromyard, in the five year period (2014-19) or over the longer plan period.

- f. Kington – The Core Strategy has identified a target of 200 dwellings for Kington over the plan period. There are no strategic proposals identified for the town.

STW – Water quality assessment – The assessment indicates that the growth proposed can be accepted within current flow limits. The issue of phosphates will be considered as part of NMP actions and through AMP6/7 in planning to meet the requirements of the Water Framework Directive.

#### DCWW Comment

Phosphorous removal scheme was completed in AMP4. Review need for AMP7 (2020-2025) scheme.

Given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of housing in Kington, in the five year period (2014-19) or over the longer plan period.

- g. Rural Areas – The Core Strategy sets a target of 5300 dwellings for rural parts of Herefordshire. There are no identified strategic sites identified in rural areas with the housing being delivered through the preparation of Neighbourhood Development Plans or (where necessary) other development plan documents.

STW – Water quality assessment – In rural areas the assessment splits the analysis between small rural STW (<50m<sup>3</sup>/d dry weather flow) and larger rural STW.

The assessment of small works used the theoretical population equivalent data. These were uplifted by the indicative growth targets for rural areas set out in policy RA1 of the Core Strategy and consumption figures. The consumption figures are applied to calculate a theoretical future dry weather flow (DWF) and which can then be compared to the existing permit limit. The assessment identifies locations where a new permit could be required to accommodate the full indicative growth target and locations where it appears the full growth could be accepted within current flow limits.

The assessment for larger rural STW identified those areas where:

1. a new permit could potentially be required to accommodate all the growth suggested by meeting the indicative growth target;

2. future flows come within 10% of permitted flow; and
3. it appears that the growth targets could be expected within current flow limits.

Sixteen of the STW fall within categories 2 and 3 above. This suggests that the Core Strategy growth target can be achieved, although in the case of works falling within category 2 ongoing monitoring is likely to be required to ensure this position is confirmed. Consultation on significant proposals may also be necessary with water companies.

Four of the works assessed fall within category 1 these are located at Kingsland, Luston and Yarpole, Lyonshall and Bosbury. In these areas the assessment suggests there is no current capacity. The assessment recommends liaison with water companies before development is permitted and it is likely that development may be required to be phased until later in the plan period. The solution is likely to be advanced as part of AMP6/7 work and through the actions of the NMP. The assessment includes an indication of the phosphate limit that could be required to achieve no deterioration and WFD targets, potential limits that could be required as part of the catchment solution for favourable condition are included in the NMP. Water companies are committed to undertake trials in AMP6 to test a range of possible options in order to determine the most appropriate option for removing phosphate and achieve the required target. As trials are not yet completed the actual works required for phosphate reduction and the costs are unknown.

DCWW have indicated that in the case of Luston and Yarpole an Improvement scheme included in AMP6 Plan under EA's 'No Deterioration' driver. Scheme to be designed for 2035 horizon, i.e. will accommodate Core Strategy growth. At Lyonshall an improvement scheme (approx. £1m) included in AMP6 Plan for completion by 2020. Scheme based on expected DWF permit limit increase. Scheme to be designed for 2035 horizon, i.e. will accommodate Core Strategy growth. At Kingsland there will be a review of the need for a scheme in AMP7 (2020-2025). Elsewhere the need for the review of further works in AMP7/8 are recognised.

The Council will continue to work with the Environment Agency and DCWW in providing advice to those communities preparing Neighbourhood Development Plans in order that this issue can be appropriately reflected in the plan making process by updating Neighbourhood Planning Guidance Note 19.

In respect of the impact on housing delivery given all this information it is reasonable to work on the technical basis that there will not be an impact upon the delivery of the rural housing target will be affected by issues related to water quality at rural STW or overall in achieving the five year targets in the housing trajectory. However, there are likely to be local impacts at affected locations which may require development to be delayed or phased in the short/medium term.

## **Dwr Cymru – Welsh Water**

In addition to providing detailed information in the water date table Dwr Cymru-Welsh Water (DCWW) have also provided the following comment regarding the NMP process

“DCWW have and will remain actively involved in the development of the Wye Nutrient Management Plan (NMP). We recognise that the NMP is a good vehicle, alongside the Water Framework Directive, to identify all contributing phosphorus (P) loads to the River Wye and to ensure that the Polluter Pays Principle is followed when assessing and deciding on measures to reduce P inputs. We look forward to the development and application of both voluntary and regulatory controls and their enforcement to reduce diffuse pollution in the catchment. Our support for the NMP process is contingent on there being equitable P reductions from all contributing sectors and that any permit changes for DCWW assets, that may arise, are affordable, proportionate, and included within the regulatory process for AMP7.

Our investment plans are prepared on a 5-year cycle to comply with Ofwat’s Price Review process. The most recent price review (PR14) identified investment plans for the AMP6 period (2015 to 2020). HCC’s Core Strategy covers a period of 20 years (2011 to 2031). In growth planning for each Price Review, we look at the expected rate of growth, e.g. units/year, to assess whether a capital intervention is likely to be needed before the end of the following 5-year AMP period. The EA’s review has considered the full 20 years of growth. In many cases, we accept that investment may be needed sometime before 2031, i.e. to accommodate the full 20 years of growth, but – based on the forecast growth rate - have determined that no intervention is needed in AMP6.”

### **Future Work**

1. Preparation of the Hereford Area Plan will require further more detailed updates of the WCS as other housing allocation are identified in order to meet the growth targets for Hereford up to 2031, where known additional information will be included regarding the types and costs of works which will be undertaken. Current timetable for this document envisages adoption in Winter 2016/2017.
2. As set out in the section upon rural areas above the Council will provide specific local information upon water cycle issues to Neighbourhood Development Plan Groups to assist in the preparation of Neighbourhood Development Plans and will revise the existing guidance note 19.
3. In addition the supporting text (para 5.3.62) to policy SD4 explains that general planning guidance will be prepared where necessary to complement actions set out in the NMP.



## Assessment of Sewage Treatment Works in Hereford to consider Impact of Growth on Permits

This assessment is to look at the effect growth in Herefordshire could have on sewage treatment works (STW) permits. This is coarse assessment and is indicative only.

There is a separate nutrient management plan for the River Wye which considers the impact of the STW on the SaC phosphate targets. Phosphate requirements for water framework directive will be considered as part of river basin planning process over the next 2 water industry investment cycles (AMP's).

Consultation with the sewage undertakers (water companies) must also be taken into account, as this assessment does not consider site specific issues, hydraulic capacity, infrastructure etc which may limit the amount of growth that can be accepted.

The sewage treatment works in Hereford have been divided in three categories Towns, Rural and Small Rural (<50m<sup>3</sup>/d). Only STW that have numeric quality limits were assessed, STW with descriptive permits are not included (no STW >50m<sup>3</sup>/d were descriptive). Different information was available for each category, meaning future flows were calculated differently for each category.

Effluent flows are expressed in m<sup>3</sup>/d and quality limits in mg/l. Any future limits are indicative only and could be subject to change.

### Small Rural (<50m<sup>3</sup>/d dry weather flow)

There is no effluent flow monitoring available for these STW.

The growth figures available are a percentage growth dependant on the locality. (Individual village figures supplied by the council are based on this % but could not be used as not all are sewered and it was not practical to match these to sewerage catchments)

Therefore the impact of the growth on future sewage flows can only be coarsely assessed using the theoretical population equivalent data.

The population equivalent (PE) figures (2013) were uplifted by the % growth and consumption figures (140l/h/d) were applied to calculate a theoretical future (new) DWF which could be compared to the existing permit limit.

As a worst case the consumption figure was applied to the additional population and added on top of the existing DWF limit (not allowing any headroom).

Constant load calculations were applied to both these scenarios to roughly highlight any STW where growth could trigger unachievable quality limits. Note this only considers sanitary quality determinands that already have numeric limits, it makes no consideration to environmental targets.

STW were than colour coded orange if the assessment suggested new permit could potentially be required, and green if it appeared growth could be accepted within current flow limit.

PERMIT	STW	BOD (Permitted)	SS (Permitted)	Ammonia (Permitted)	PE 2013	Calc DWF (PE*14 0l/hd)	PE uplifted by growth	Additio nal PE	Additio nal DWF	Calc future DWF (based on add'n DWF + permitted DWF - NO ALLOWA NCE FOR HEADRO OM)	Calc future DWF (based on uplifted PE * 140l/hd)	DWF limit	% uplift (Growth % based on locality)	Locality Rural	Conclusions and Options	DCWW Comments
AL1000301	BISHOPS FROME STW	75	110		457	64	521	64	9	48	73	39	14	Ledbury	May need higher flow limit to accommodate growth. Constant load indicate potential limits achievable but no current ammonia. Could cross 50m <sup>3</sup> /d threshold. Current PE indicates current permit DWF is low.	Current STW performance good. Historic growth very low. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
AL1000901	CANON PYON STW	30	47		201	28	237	36	5	37	33	32	18	Hereford	Can potentially accept with current limit. Worst case constant load indicates limits achievable but no current ammonia.	Growth scheme (~£0.8m) evaluated for PR14 but didn't make the cut for AMP6. Review need for AMP7 (2020-2025) scheme at PR19.

PERMIT	STW	BOD (Permitted)	SS (Permitted)	Ammonia (Permitted)	PE 2013	Calc DWF (PE*14 0l/hd)	PE uplifted by growth	Additio nal PE	Additio nal DWF	Calc future DWF (based on add'n DWF + permitted DWF - NO ALLOWA NCE FOR HEADRO OM)	Calc future DWF (based on uplifted PE * 140l/hd)	DWF limit	% uplift (Growth % based on locality)	Locality Rural	Conclusions and Options	DCWW Comments
AL1001001	DILWYN STW	42	60		352	49	401	49	7	56	56	49	14	Leominster	May need higher flow limit to accommodate growth. Constant load indicate potential limits achievable but no current ammonia. Could cross 50m3/d threshold.	Current STW performance good. Historic growth very low. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
AL1001201	EDWYN RALPH STW	25	35		140	20	161	21	3	9	23	6	15	Bromyard	Growth impact negligible as small catchment. Current PE indicates current permit DWF is low.	Current STW performance acceptable. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
S/21/25806/ R	FROMES HILL STW	40	60		192	27	219	27	4	31	31	27	14	Ledbury	May need higher flow limit to accommodate growth. Constant load indicate potential limits achievable but no current ammonia.	N/A (SvT STW)
AH1001402	HOLME LACY STW	150	150		388	54	458	70	10	34	64	24	18	Hereford	May need higher flow limit to accommodate growth. Constant load indicate potential limits achievable but no current ammonia. Current PE indicates current permit DWF is low.	Current STW performance good. Historic growth very low. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
AL1001301	IVINGTON STW	75	100	18	77	11	88	11	2	16	12	14	14	Leominster	Growth impact negligible as small catchment. Worse case constant load indicates limits achievable	Maintenance scheme completed in AMP5. . Unlikely to require review until AMP7/8.
AH1002001	LITTLE DEWCHURCH STW	30	40	10	318	45	375	57	8	49	53	41	18	Hereford	May need higher flow limit to accommodate growth. Constant load indicate potential limits achievable. Close to 50m3/d threshold.	Growth scheme (i.e. capacity increase) completed in AMP5 (2015). Design horizon for scheme ~2030. Unlikely to require review until AMP7/8.
AL1001901	MOCCAS STW	13	20	3	80	11	90	10	1	25	13	24	12	Golden Valley	Growth negligible as small catchment. Can potentially accept with current limits.	Maintenance scheme completed in AMP5. . Unlikely to require review until AMP7/8

PERMIT	STW	BOD (Permitted)	SS (Permitted)	Ammonia (Permitted)	PE 2013	Calc DWF (PE*14 0l/hd)	PE uplifted by growth	Additio nal PE	Additio nal DWF	Calc future DWF (based on add'n DWF + permitted DWF - NO ALLOWA NCE FOR HEADRO OM)	Calc future DWF (based on uplifted PE * 140l/hd)	DWF limit	% uplift (Growth % based on locality)	Locality Rural	Conclusions and Options	DCWW Comments
AL1002301	OCLE PYCHARD STW	25	35	10	53	7	61	8	1	13	9	12	15	Bromyard	Growth negligible as small catchment. Can potentially accept with current limits.	Maintenance scheme completed in AMP5. . Unlikely to require review until AMP7/8
S/21/26650/ R	PUTLEY GREEN STW	25	45	10	76	11	87	11	1	20	12	19	14	Ledbury	Growth negligible as small catchment. Can potentially accept with current limits.	NA (SvT STW)
AN0354001	TITLEY STW	13	20	3	154	22	172	18	3	53	24	50	12	Kington	Could potentially accept growth with current limit (based on PE), growth minimal effect as small catchment. If higher flow limit required may cross 50m3/d threshold, and sanitary limits already tight. PE indicates current permit DWF is high.	Has experienced relatively high growth in past decade. Review need for AMP7 (2020-2025) scheme at PR19.
AL1003101	WESTBURY COUNCIL HOUSES STOKE LACEY STW	30	60		135	19	155	20	3	33	22	30	15	Bromyard	Growth impact negligible as small catchment. Worse case constant load indicates limits achievable	Unlikely to require review until AMP7/8

## Rural

The growth figures available are a percentage growth dependant on the locality. (Individual village figures supplied by the council are based on this % but could not be used as not all area's are sewered and it was not practical to match these to sewerage catchments)

Effluent flow monitoring data is available, the measured Q80 is considered to be the dry weather flow DWF, it is expressed in m3/day. In most cases the last three years of measured flow data was used (2011-2013). The Q80 figures from each year were averaged to make best use of most recent data.

**Permit headroom** : Calculated by subtracting measured flow (see above comments) from the permitted DWF limit.

**Capacity** (number houses): Calculated by dividing the permit headroom by consumption figure (140l/h/d) to calculate the headroom in people. This was then divided by the assumed population per house (2.4) to express the headroom as number of houses **(NB: this is intended as a rough guide only, due to variability in data and assumptions used). It is recommended that the sewage undertaker is fully involved in the allocation of development.**

**Additional DWF** : Calculated by taking the additional PE (PE uplifted by % growth minus existing PE) and applying the consumption figure to get additional flow.

**Future DWF**: The additional DWF was added to the measured flow, this reflects the headroom available.

For comparative purposes the additional DWF was added to the both the measured Q80 from the last 3 years and to the Q80 measured flow from all available years. The measured flows were also directly uplifted by the % growth figure. However in line with using most up to date and accurate data the Future DWF calculated using the last 3 years measured data added to the calculated additional DWF was used to decide if further assessment was required.

**Assessment:**

The future DWF was then compared to the current permitted DWF flow limit, and STW were than colour coded pink if the assessment suggested new permit could potentially be required, orange if future flows come within 10% of permitted flow and green if it appeared growth could be accepted within current flow limit.

**Future DWF exceeds the current permitted limit** (highlighted pink) STW was taken forward for further assessment. New permit likely to be required to accommodate growth, growth may need to be scheduled to allow sewage undertaker time to investigate and plan for additional load. Monte Carlo (mass balance) modeling was completed to assess potential future quality permit limits required to maintain no deterioration, maintain current WFD class and if required to meet WFD good status under current and future flows (to demonstrate if growth made this harder to achieve). Comments on individual STW are provided in the table.

**Calculated Future DWF's were within 10% of the permitted limit** (highlighted orange) the STW should be able to accept growth within permitted flow limit but some caution should be applied. Levels of growth and effluent flow monitored should be monitored, especially if growth pattern is not as expected. Constant load calculations were applied a worst case scenario of additional DWF plus permitted limit (no allowance for headroom) to roughly highlight any STW where growth could trigger unachievable quality limits. (Note this only considers sanitary quality determinands that already have numeric limits, it makes no consideration to environmental targets). Comments on individual STW are provided in the table.

**Future DWF below the current permitted limit:** STW should be able to accept growth within permitted flow limit. But consideration must be given to hydraulic capacity and infrastructure.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AL1000401	BODENHAM STW	Lugg	160	15	53	158	11.7	119	112	Bromyard	40/15/-					Current STW performance good. Historic growth very low. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
	AH1000401	CLEHONGER STW	Cage Bk (Wye to Lugg)	213	18	97	288	29.5	146	159	Hereford	25/18/-					Based on growth information provided to DCWW, no scheme was planned for AMP6. However, some recent planning applications for larger sites. Review need for AMP7 (2020-2025) scheme at PR19.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AN0218201	EARDISLEY STW	Wye (Wye to Lugg)	362	12	77	229	13.7	299	323	Kington	50/-/-				Growth can potentially be accepted within current flow limit. Historic measured STW flows were slightly higher so worst case estimate (all measured flows * % growth increase) could indicate that with growth STW flow would be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Current STW performance good. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
	AH1000901	FOWNHOPE STW	Wye (DS Lugg)	214	18	103	307	21.3	132	133	Hereford	40/25/-					Current STW performance good. Historic growth very low. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AS1001101	GOODRICH STW	Wye (DS Lugg)	455	14	222	660	36.1	269	473	Ross	50/15/-				Growth can potentially be accepted within permit flow limit. High STW flows were recorded 2011 & 2012 (potentially data issue) so only 2013 flow used in assessment. Future flow should be assessed to confirm if headroom available. Liaison with water company recommended before significant growth. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Current STW performance good. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
YES	AL1001401	KINGSLAND STW	Pinsley bk (Lugg)	685	14	0	0	12.2	699	578	Leominster	41/-/-	24/4/-	Current/5/-	Current BOD/Ammonia class already good or high. Phosphate modelling indicate a limit around 0.5 mg/l could be required to achieve good status (new phosphate target), however final solution to be considered as part of AMP6/7 and NMP work, the growth should not have a significant impact on the potential phosphate limit required.	Growth would require new permit. No current capacity. Current investigation ongoing into options for site. Recommend liaison with water company before any development. Need to assess situation in future to confirm when if / when headroom may be available. Potential BOD and ammonia limits can be met within the limits of BAT. Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	DWF permit limit increased approx. tenfold in 2010, following 2006/7 monitoring. Permit exceeded in 2013 but compliant again in 2014. Reasons for permit exceedance in 2013 are being investigated. Infiltration in catchment known to be high. Review need for AMP7 (2020-2025) scheme at PR19.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AH1001901	KINGSTONE AND MADELY STW	Coldstone Bk (Wye to Lugg)	427	18	130	387	53.4	350	368	Ross (Kingstone) & Hereford (Madeley)	7/3/-					Improvement scheme completed in AMP5 under Quality (FLOW) driver. Design horizon ~ 2030. Unlikely to require review until AMP7/8
	AH1002101	LONGTOWN STW	Olchon Bk (Monnow)	69	12	27	81	2.7	44	44	Golden Valley	40/35/-					No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
YES	AL1001701	LUSTON AND YARPOLE STW	Ridge moor Bk (Lugg)	102	14	0	0	14.2	138	149	Leominster	22/11/-	19/4/-	Current/10/-	Current BOD / Ammonia class already good or high. Phosphate modelling indicate a limit around 1mg/l could be required to achieve good status (new phosphate target), however final solution to be considered as part of AMP6/7 and NMP work, the growth should not have a significant impact on the potential phosphate limit required.	Growth would require new permit. No current capacity. AMP6 No deterioration scheme to introduce ammonia limit. Current investigation ongoing into options for site. Recommend liaison with water company before any development. Need to assess situation in future to confirm when if / when headroom may be available. Potential BOD and ammonia limits can be met within the limits of BAT. Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	Improvement scheme included in our AMP6 Plan under EA's 'No Deterioration' driver. Scheme to be designed for 2035 horizon, i.e. will accommodate Core Strategy growth.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
YES	AL1001801	LYONSHALL STW	Curl Bk (Arrow)	57	12	0	0	39.2	110	111	Kington	22/10/-	19/4/-	Current/4/-	Current BOD / Ammonia class already good or high. Phosphate modelling indicates a limit around 0.3 - 0.5 mg/l could be required to achieve good status (new phosphate target), however final solution to be considered as part of AMP6/7 and NMP work, the growth could have a slight impact on the potential phosphate limit required. Phosphate BAT is dependent on trials in AMP6 period.	Growth would require new permit. No current capacity. Current investigation ongoing into options for site. Recommend liaison with water company before any development. Need to assess situation in future to confirm when if / when headroom may be available. Potential BOD and ammonia limits can be met within the limits of BAT. Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	Improvement scheme (approx. £1m) included in AMP6 Plan for completion by 2020. Scheme based on expected DWF permit limit increase. Scheme to be designed for 2035 horizon, i.e. will accommodate Core Strategy growth.
YES	AH1002201	MORETON ON LUGG STW	Lugg	665	18	185	551	96.9	577	607	Hereford	20/15/1				Growth can potentially be accepted within current flow limit. Historic measured flows were slightly higher so worst case estimate (using all available data) indicates with growth would be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Phosphorous removal scheme completed in AMP4. Review need for AMP7 (2020-2025) scheme at PR19.



NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AN0231301	MUCH DEWCHURCH NEW STW	Worm Bk (Monnow)	132	14	26	76	15.5	122	127	Ross	20/8/-				Growth can potentially be accepted within current flow limit. With growth STW flow could be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Improvement scheme completed in AMP5 under Quality (FLOW) driver. Design horizon ~ 2030. Unlikely to require review until AMP7/8
YES	AL1002401	PEMBRIDGE STW	Arrow	120	12	11	33	8.5	117	122	Kington	21/-/-				Growth can potentially be accepted within current flow limit. H. With growth STW flow could be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Growth scheme (~£1.4m) evaluated for PR14 but didn't make the cut for AMP6. Review need for AMP7 (2020-2025) scheme at PR19.
	AH1003001	PETERCHURCH STW	Dore (Monnow)	154	12	52	154	18.5	121	116	Golden Valley	30/12/-					No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AH1003301	PONTRILAS STW	Dulas (Monnow)	407	14	89	265	19.7	337	381	Golden Valley & Ross	19/6.5/-				Growth can potentially be accepted within current flow limit. Historic measured flows were slightly higher so worst case estimate (using all available data) indicates with growth could cause permit limit exceedance. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Improvement scheme completed in AMP5 under Quality (FLOW) driver. Design horizon ~ 2030. Unlikely to require review until AMP7/8.
YES	AL1002701	SHOBDON STW	Pinsley bk (Lugg)	150	12	19	56	16.3	147	154	Kington	40/12/-				Growth can potentially be accepted within current flow limit. With growth STW flow could be within 10% of permit limit. Historic flows were slightly higher so worst case estimate could cause permit exceedance. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	Improvement scheme completed in AMP5 under Maintenance driver. Design horizon ~2030.

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	AH1003701	TARRINGTON STW	Tarrington Bk (Frome)	155	18	73	217	12.8	95	94	Hereford	20/5/-					Current STW performance good. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
YES	AL1003501	WEOBLEY STW	Newbridge Bk (Arrow)	350	14	126	374	23.5	248	266	Leominster	19/7/-					Current STW performance good. No intervention required in AMP6 (2015-2020). Review need for AMP7 (2020-2025) scheme at PR19.
	S/21/25795/R	BOSBURY STW	RIVER LEADON	82	14	0	0	6.6	96	95	Ledbury	30/-/-	14/9/-	Current/13/-	Current BOD / Ammonia class already good or high. Phosphate modelling indicates a limit around 1 mg/l could be required to achieve good status (new phosphate target), however final solution to be considered as part of AMP6/7 work, the growth should not have a significant impact on the potential phosphate limit required.	Growth would require new permit. No current capacity. Current investigation ongoing into options for site. Recommend liaison with water company before any development. Need to assess situation in future to confirm when if / when headroom may be available. Potential BOD and ammonia limits can be met within the limits of BAT. Phosphate to be considered as part of AMP6/7 planning for WFD.	NA (SvT STW)

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	S/09/55757/R	COLWALL STW	CRADLEY BROOK	760	14	132	392	44.2	673	693	Ledbury	10/3/-				Growth can potentially be accepted within current flow limit. Historic measured flows were slightly higher so worst case estimate (using all available data) indicates with growth STW flow would be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	NA (SvT STW)
	S/09/55946/R	CRADLEY STW	CRADLEY BROOK	213	14	35	104	21.9	200	206	Ledbury	35/20/-				Growth can potentially be accepted within current flow limit. With growth STW flow would be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD targets and only considers parameters currently permitted)	NA (SvT STW)
	S/09/55912/R	LEINTWARDINE STW	RIVER TEME	215	14	133	396	14.3	96	97	Leominster	40/-/-					NA (SvT STW)
	S/09/55935/R	WHITBOURNE STW	RIVER TEME	76	15	38	113	6.7	45	63	Bromyard	60/-/-					NA (SvT STW)

NMP	PERMIT NO	STW	Rec Water	Permitted DWF limit	% Growth uplift	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140l/h /d consumption per person/2.4 people per house)	Rural Addt'n DWF (m3/d)	RURAL Future DWF (add't DWF + measured)	Rural future dwf (add't DWF + all yrs measured)	Locality Rural	Permitted BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure good WFD status	Overall Conclusions and Options	DCWW Comments
	S/09/55933/R	WIGMORE STW	TRIB OF RIVER TEME	158	14	36	107	14.3	136	139	Leominster	15/5/-					NA (SVT STW)

## TOWNS

The growth figures available are number of properties planned in each town.

Effluent flow monitoring data is available, the measured Q80 is considered to be the dry weather flow DWF, and it is expressed in m3/day. In most cases the last three years of measured flow data was used (2011-2013). The Q80 figures from each year were averaged to make best use of most recent data.

**Permit headroom:** Calculated by subtracting measured flow (see above comments) from the permitted DWF limit.

**Capacity** (number houses): Calculated by dividing the permit headroom by consumption figure (140l/h/d) to calculate the headroom in people. This was then divided by the assumed population per house (2.4) to express the headroom as number of houses **(NB: this is intended as a rough guide only, due to variability in data and assumptions used). It is recommended that the sewage undertaker is fully involved in the allocation of development.**

**Additional DWF :** Calculated by taking number of required houses and applying assumed number of people per house (2.4) and the consumption figure (140l/h/d)  
(Number of required houses = Total No Homes minus No Completed 2011-2013)

**Future DWF:** The additional DWF was added to the measured flow (this reflects the headroom available).

*For comparative purposes the additional DWF was added to the both the measured Q80 from the last 3 years and to the Q80 measured flow from all available years. However in line with using most up to date and accurate data the Future DWF calculated using the last 3 years measured data added to the calculated additional DWF was used to decide if further assessment was required.*

### Assessment:

The future DWF was then compared to the current permitted DWF flow limit, and STW were then colour coded pink if the assessment suggested new permit could potentially be required, orange if future flows come within 10% of permitted flow and green if it appeared growth could be accepted within current flow limit.

**Future DWF exceeds the current permitted limit** (highlighted pink) STW was taken forward for further assessment. New permit likely to be required to accommodate growth, growth may need to be scheduled to allow sewage undertaker time to investigate and plan for additional load. Monte Carlo (mass balance) modeling was completed to assess potential future quality permit limits required to maintain no deterioration, maintain current WFD class and if required to meet WFD good status under current and future flows (to demonstrate if growth made this harder to achieve). Comments on individual STW are provided in the table.

**Calculated Future DWF's were within 10% of the permitted limit** (highlighted orange) the STW should be able to accept growth within permitted flow limit but some caution should be applied. Levels of growth and effluent flow monitored should be monitored, especially if growth pattern is not as expected. Constant load calculations were applied a worst case scenario of additional DWF plus permitted limit (no allowance for headroom) to roughly highlight any STW where growth could trigger unachievable quality limits. (Note this only considers sanitary quality determinands that already have numeric limits, it makes no consideration to environmental targets). Comments on individual STW are provided in the table.

**Future DWF below the current permitted limit:** STW should be able to accept growth within permitted flow limit. But consideration must be given to hydraulic capacity and infrastructure.

Hereford is served by two STW which share an inlet, these are considered individually with growth split between them (according to current flow split) and combined. This is explained further in the towns table.

NMP	PERMIT NO	STW	Rec Water	DWF limit	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140 l/h/d consumption per person/2.4 people per house)	Required HOUSES (Strategic Allocation Total No Homes - Completed)	Add'n DWF m3/d	TOWNS Future DWF (add't dwf + measured)	towns future dwf (add't dwf + all yrs measured)	Strategic Allocation Total No Homes	Completed Homes (2011-2013)	Current BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure and good WFD status	Conclusions and Options	DCWW Comments
YES	AL1000602	BROMYARD STW	Frome	928	316	939	499	168	780	854	500	1	25/5/1				Growth can potentially be accepted within current flow limit. Historic measured flows were slightly higher so worst case estimate (using all available data) indicates with growth would be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD and only considers parameters currently permitted). Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	Phosphorous removal scheme completed in AMP4. Review need for AMP7 (2020-2025) scheme at PR19.
YES	AL1001501	KINGTON STW	Arrow	701	266	790	195	66	501	494	200	5	24/15/1				Growth can potentially be accepted within current flow limit. Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	Phosphorous removal scheme completed in AMP4. Review need for AMP7 (2020-2025) scheme at PR19.
YES	AN0228301	LEOMINSTER STW	Lugg	2850	541	1609	2235	751	3060	3172	2300	65	35/9/1	31/8/0.7	Current/Current	Current BOD / Ammonia / Phosphate class already good or high. Phosphate modelling indicate a limit around 0.1mg/l could be required to achieve good status (new phosphate target), however final solution to be considered as part of AMP6/7 and NMP work, the growth should not have a significant impact on the potential phosphate limit required.	Growth would require new permit. Limited current capacity. Recommend liaison with water company before any development to confirm when if / when headroom will be available. Potential BOD and ammonia limits can be met within the limits of BAT. Phosphate to be considered as part of NMP and AMP6/7 planning for WFD. Phosphate BAT is dependent on trials in AMP6 period.	Full Core Strategy growth, i.e. 20yrs. is likely to trigger need for increased DWF permit, with likely sanitary consent tightening. Growth to 2020 unlikely to breach flow limit but will need to review need for AMP7 scheme at PR19. Would be appropriate to integrate growth, quality (P-removal), and maintenance requirements into a potential AMP7 scheme. A flow reduction scheme has been included in our AMP6 programme to try and reduce infiltration in the sewerage network.

NMP	PERMIT NO	STW	Rec Water	DWF limit	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES <small>(Based on Flow headroom (Permitted - Measured)/140 l/h/d consumption per person/2.4 people per house)</small>	Required HOUSES <small>(Strategic Allocation Total No Homes - Completed)</small>	Add'n DWF m3/d	TOWNS Future DWF (add't dwf + measured)	towns future dwf (add't dwf + all yrs measured)	Strategic Allocation Total No Homes	Completed Homes (2011-2013)	Current BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure and good WFD status	Conclusions and Options	DCWW Comments
	AS1003701	ROSS LOWER CLEEVE STW	Wye	3632	647	1926	846	284	3269	3285	900	54	44/40/2				Growth can potentially be accepted within current flow limit. With growth STW flow could be within 10% of permit limit. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD and only considers parameters currently permitted). Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	Growth scheme (~£3.5m) included in the AMP6 capital programme for completion by 2020. Design horizon ~ 2035 will accommodate core strategy growth.
	S/21/26211/R	LEDBURY STW	RIVER LEADON	3068	927	2760	783	263	2404	2596	800	17	10/3/2				Growth can potentially be accepted within current flow limit. Phosphate to be considered as part of AMP6/7 planning for WFD.	NA (SvT STW)
HEREFORD																		

NMP	PERMIT NO	STW	Rec Water	DWF limit	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES <small>(Based on Flow headroom (Permitted - Measured)/140 l/h/d consumption per person/2.4 people per house)</small>	Required HOUSES <small>(Strategic Allocation Total No Homes - Completed)</small>	Add'n DWF m3/d	TOWNS Future DWF (add't dwf + measured)	towns future dwf (add't dwf + all yrs measured)	Strategic Allocation Total No Homes	Completed Homes (2011-2013)	Current BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure and good WFD status	Conclusions and Options	DCWW Comments
YES	AH1001101	EIGN STW	Wye (Wye to Lugg)	16392	394	1173	2509	843	16841	14129	2600	91	28/10/1				Individually accepting 40% of Hereford growth could potentially cause the flow limit to be exceeded, however this is based on adding growth to highest measured flows (2013). In addition Eign STW cannot be considered in isolation as the inlet is combined with Rotherwas. Considering the two STW combined there is potentially capacity to accept the growth. However the situation will need to be monitored throughout the growth period, recommend liaison with water company before any significant development. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD and only considers parameters currently permitted). Phosphate to be considered as part of NMP and AMP6/7 planning for WFD.	See comment under combined works below.



NMP	PERMIT NO	STW	Rec Water	DWF limit	Flow headroom M3/D (Permitted DWF - 3 yr Q80)	CAPACITY No HOUSES (Based on Flow headroom (Permitted - Measured)/140 l/h/d consumption per person/2.4 people per house)	Required HOUSES (Strategic Allocation Total No Homes - Completed)	Add't'n DWF m3/d	TOWNS Future DWF (add't dwf + measured)	towns future dwf (add't dwf + all yrs measured)	Strategic Allocation Total No Homes	Completed Homes (2011-2013)	Current BOD / Ammonia / Phosphate	Future BOD / Ammonia / Phosphate to ensure 'no deterioration'	Future BOD / Ammonia / Phosphate to ensure current WFD class status	Future BOD / Ammonia / Phosphate to ensure and good WFD status	Conclusions and Options	DCWW Comments
YES	AH1001201	ROTHERWAS STW	Wye (Wye to Lugg)	27212	1918	5708	3764	1265	26559	23447	3900	136	28/10/1				Rotherwas could potentially accept 60% of Hereford growth within current flow limit, this is based on adding growth to highest measured flows (2013). However Rotherwas STW cannot be considered in isolation as the inlet is combined with Eign. Considering the two STW combined there is potentially capacity to accept all the growth. A consent load calculation of STW sanitary quality limits, based on permitted flow + growth (no allowance for headroom) indicates resultant limits would be achievable within BAT (does not consider WFD and only considers parameters currently permitted). Phosphate to be considered as part of NMP and AMP6/7 planning for WFD. Recommend close liaison with Water Co through development period.	See comment under combined works below.
YES		HEREFORD (EIGN and ROTHERWAS COMBINED)	Wye (Wye to Lugg)	43604	2312	6882	6273	2108	43400		6500	227	28/10/1				Considering the two STW combined there is potentially capacity to accept the growth (based on adding growth to highest combined measured flows (2013). Phosphate to be considered as part of NMP and AMP6/7 planning for WFD. Recommend close liaison with Water Co through development period.	Major STW which sees significant capital expenditure in every AMP period. Phosphorous removal scheme completed in 2011, with associated capacity increase. Need for AMP7 scheme (including potential P removal for NMP) to be reviewed at PR19. An infiltration reduction scheme (~£1m), included in AMP6 programme (2018), should reduce flows to the STW if successful, partially offsetting increases due to growth.

