

Chapter three - wastewater

Wastewater chapter contents

This chapter reviews the environmental capacity for development with respect to water quality. It then reviews the implications of development on wastewater infrastructure, including wastewater collection (sewerage) wastewater treatment, and treated wastewater disposal.

Slide 3-2 describes how water services infrastructure is planned, funded and delivered

Slides 3-3 to 3-6 describe the methodology used to assess environmental and infrastructure capacity, and to determine future infrastructure requirements

Slides 3-7 to 3-43 summarise the results of the assessment



Figure 3.1 A typical WwTW

Water Company Water services infrastructure

Legislation

Anglian Water Services Limited is appointed as the water and sewerage undertaker for the Anglian region through an appointment made under the Water Industry Act 1991 (see attached map with operating boundaries). The principal duties of a water and sewerage undertaker are set out in that legislation. Section 37 of that Act places a duty upon a water undertaker to develop and maintain an efficient and economical system of water supply within its area. Similarly Section 94 places a duty upon a sewerage undertaker to provide, improve and extend a system of public sewers to ensure that its area is effectually drained and the contents of those sewers effectually dealt with.

Regulation

The Water Services Regulation Authority (Ofwat) is the economic regulator of water and sewerage companies in England and Wales. For every five year asset management planning (AMP) cycle, companies submit a business plan to Ofwat. The plans set out each company's view of what it needs to do to maintain its assets, improve services to customers and deal with its impact on the environment. The funding is linked to the setting of customer bills (the so-called "price review" or PR).

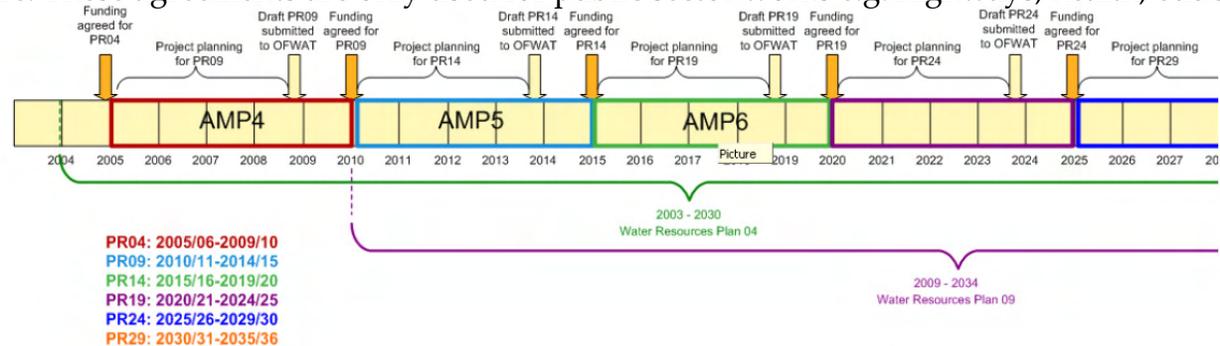
Any infrastructure requirements which arise after agreement of the five year AMP will normally be considered for the following AMP period. AMP5 will cover the period 2010 to 2015. The next review will conclude in PR14 and will set customer bills and the water company investment plans for the period 2015 – 2020, or AMP6.

Developer Contributions

When a developer wishes to proceed with a particular site, they will requisition the appropriate water company (or companies if separate for water and wastewater) to provide infrastructure in accordance with the relevant provisions of the act (Section 98 for sewerage and Section 41 for water) The cost of this is shared between the developer and undertaker in accordance with provisions of legislation. For infrastructure serving more than one development site, it is necessary to share costs equitably between developers.

The current system of "section 106 agreements" between planning authorities and developers is not used as a mechanism for recovering the cost of water or wastewater infrastructure. These agreements are only used for public sector works e.g. highways, health, education, flood mitigation.

This water cycle study has considered the site allocations developments and, together with AWS undertaken an assessment of the feasibility of provision of infrastructure, and assessment of the scale and likely most route of funding for this infrastructure.



Wastewater and Water quality

A review of water quality is required during the development process to ensure that development does not adversely affect water quality, and does not hinder the ability of a water body to meet the WFD. This overview outlines the process to assess water quality as part of the WCS.

Effluent from development can adversely affect water quality in two principal ways:

- increases in final effluent load from WwTW which causes a deterioration of water quality; and
- increases in intermittent discharges from combined sewer overflows (CSOs), pumping stations, and storm tanks at WwTW – the potential for development to affect the operation of overflows has been assessed as part of the wastewater assessment.

The future expansion potential of a wastewater treatment works with respect to water quality is determined by assessing the Environmental Permit or Discharge Consent, set by the Environment Agency. This consent is based on the ecological sensitivity of the receiving watercourse and specifies a maximum flow and a minimum effluent quality that the WwTW has to achieve to meet water quality targets without causing environmental damage.

As the population connected to a wastewater treatment works increases, the amount of treated wastewater (or effluent) being discharged to the receiving water generally increases in proportion to the population increase. When this increased population causes the treatment works to exceed the consented maximum discharge volume allowed by the Environment Agency consent or permit, improvements are likely to be required to the treatment works to improve the standard of treatment and to ensure river quality does not deteriorate.

The quantity of treated effluent discharged from each treatment works and its quality is specified by the legal discharge consent or permit, issued by the Environment Agency under the Water Resources Act 1991 or the Environmental Permitting Regulations 2010. The consent is normally based upon the Dry Weather Flow (DWF) of the treated effluent, and typically stipulates limits for the concentration of biochemical oxygen demand (BOD), total suspended solids (TSS) and ammoniacal nitrogen (NH₃), and may include limits for other substances such as metals and phosphate. Compliance is determined by means of statistical analysis of effluent quality data.

When new or revised discharge consents are considered by the Environment Agency, consent limits will be set with a view to meeting the requirements of the Water Framework Directive (WFD) whose aim is to ensure that good river quality standards are met throughout each waterbody. The discharge consent limits will be based upon the quality and volume of the receiving watercourse and the volume of wastewater effluent at the point of discharge.

Where forecast population increase upstream of a combined sewer overflow is greater than 10%, an Urban Pollution Modelling study will be required to ensure that the increase does not lead to a deterioration in water quality. We have not received enough data from Anglian Water Services to determine which allocations will need to be tested with a UPM assessment. Therefore it remains the responsibility of AWS to identify when and where a UPM study is needed.

Water quality environmental limits methodology

To assess the environmental impact of growth we have assessed the maximum number of houses likely to be connected to each WwTW to assess whether a new flow consent is likely to be required to accommodate growth. If growth will not cause a breach of the current consented DWF then it is fair to assume that there will not be deterioration of planned water quality (that is the water quality the Environment Agency expects if a WwTW was discharging at its DWF and discharge consent). Even if growth will not cause breach of consented DWF at the WwTWs there may need to be tightening of discharge consents at the WwTWs to help meet the more stringent environmental standards required by the WFD. However, the purpose of the water quality assessment in a WCS is to identify where development may cause deterioration of water quality, or where growth will prevent good status being achieved.

A no deterioration assessment has then been carried out. This analysis has used the Environment Agency River Quality Planning (RQP) toolkit, or using simple spreadsheet calculations where water quality or river flow data were not agreed or available.

The no deterioration assessment calculates the BOD, ammonia and phosphate consent required at the WwTW to maintain the current WFD status with the addition of the 2026 growth flows. For this the upstream river flow and quality values and the future DWF are entered into RQP with the current WFD status (as provided by the Environment Agency) used as the target value for downstream river quality. The future consents required to meet no deterioration of status are then calculated.

Further to the no deterioration analysis, an assessment has been made to establish whether growth is likely to make achievement of WFD good status unfeasible. To assess this, the consents required to meet good WFD status are calculated with the current consented flows and the 2031 growth flows. The difference between these consents determines whether the growth has an impact on the ability to meet good status.

This analysis has also used the Environment Agency River Quality Planning (RQP) toolkit. To calculate the consent required at the WwTW to meet WFD good status the upstream river flow, agreed quality values and the current consented DWF are entered into RQP with WFD good status used as the target value for downstream river quality. The current consents required to meet WFD good status are then calculated. This process is then repeated with the 2026 growth DWF.

The full findings of the water quality environmental limits assessment can be found in Appendix A. The implications of the calculated indicative consent standards on wastewater treatment infrastructure and on allocated development is discussed in the following slides. These indicative consent standards are based on the data and information at the time of this study. Changes in environmental conditions, monitoring results or forecast development profiles may all change the results. Therefore the results should only be used to provide an indication of when a consent may be exceeded, and to test the strategic feasibility of development locations. The final consent or permit conditions, and any mitigation measures necessary, can only be agreed when Anglian Water apply for a new or varied environmental permit.

Wastewater infrastructure assessment methodology

Even if there is environmental capacity for development, it does not necessarily mean that the infrastructure capacity is available or can be viably made available. However, unlike environmental capacity, infrastructure capacity is very rarely an absolute constraint to development; if new infrastructure is required, subject to there being land available, funding, and time to plan and deliver new infrastructure, it can be made available. Therefore it is essential that a water cycle study consider the implications of land availability, and time to plan, fund and deliver new infrastructure to facilitate new developments.

Wastewater treatment infrastructure

Anglian Water have undertaken an assessment of the scale of infrastructure required at each of the wastewater treatment sites that may be affected by committed or allocated development. This has involved identifying:

- When growth may cause the consented discharge to exceed the current consent
- When Anglian Water may need to provide additional infrastructure to accommodate planned developments
- The scale of infrastructure that may be required
- The estimated lead time to deliver additional infrastructure
- Any issues that may impact on delivery timescale, such as the need for additional land

At this stage Anglian Water have not identified need for additional land take for wastewater treatment facilities outside of their current site boundaries. Anglian Water reviews their strategic direction statement and their business plan every five years with the next review taking place in 2014. Anglian Water consider it highly unlikely that they will need additional land to deliver wastewater treatment before this next review of their business plan. This position will be reviewed in the preparation of PR14 and a decision will be made then covering the period 2015 – 2020.

There may be more sustainable or cost effective options to delivering additional wastewater treatment capacity and meeting Water Framework Directive obligations than the provision of additional infrastructure requirements. Examples could include retrofit demand management measures in existing urban areas, or through removal of surface water from the foul drainage system. These alternative measures could also be used to mitigate the risk of WFD classification deterioration where the analysis in the following slides identifies that a new permit may be needed that is tighter than can be achieved with conventional wastewater treatment technology.

Wastewater infrastructure assessment methodology (cont.)

Wastewater network infrastructure

Anglian Water undertook a Red Amber Green assessment of both Local Authority's Site Allocations DPDs. A large number of allocations were classified as green, and therefore had available wastewater network capacity to facilitate development without the requirement for infrastructure provision. However, there were a number of sites which were identified as Amber and Red which required further assessment. The water cycle study, informed by AWS has undertaken a further assessment of the infrastructure requirements at these Red and Amber locations. This assessment has identified the scale of additional infrastructure that would be required to support each development site being assessed, what the source of funding for this infrastructure is likely to be, and the timescale for the delivery of infrastructure. Where a major solution is required that could not be delivered through the Section 106 Developer requisition process, funding will be dependant on the scheme being identified and approved by Ofwat in AWS 2014 business plan.

Assessment results

The following results are subdivided into wastewater network catchments. Water quality and wastewater treatment infrastructure are discussed first, followed by an assessment of wastewater network requirements for developments that fall within that catchment. The wastewater network assessment excludes those allocations that were identified as GREEN by Anglian Water in their consultation to the Site Allocations and Development Management DPDs.

You can navigate around the study area using the wastewater catchment map on the next page.

You can return to the wastewater catchment map at any time by clicking on the map icon in the bottom navigation bar below as highlighted.

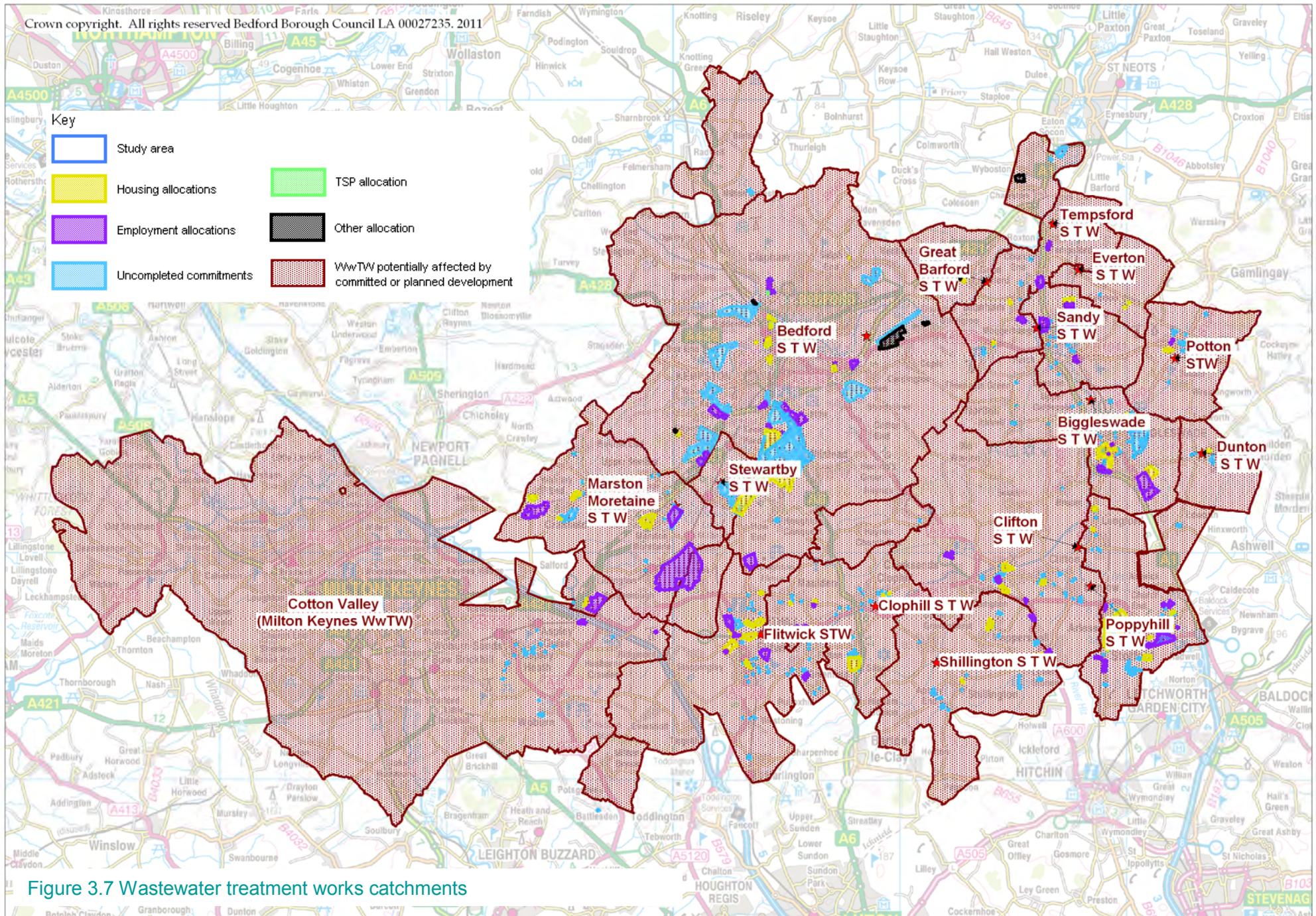


Figure 3.7 Wastewater treatment works catchments

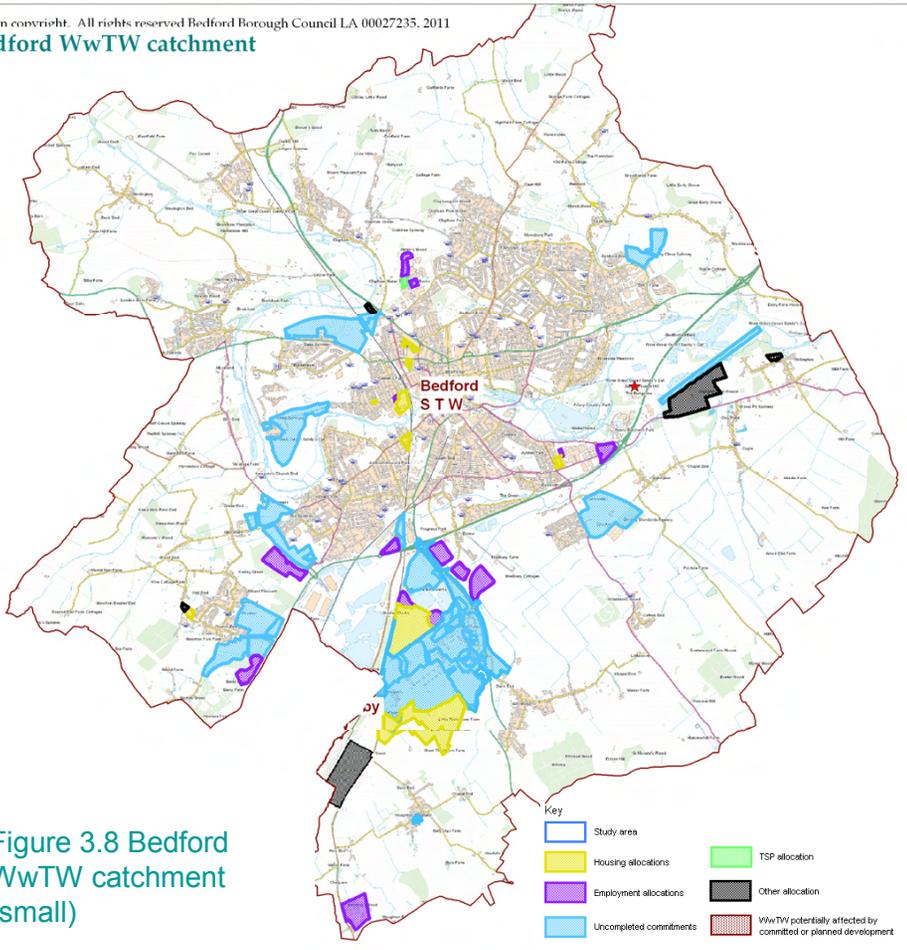


Figure 3.8 Bedford WwTW catchment (small)

Bedford wastewater treatment

Based on current forecast housing allocation and commitments Bedford WwTW will require a review of its consent during AMP5 (2010 – 2015).

Indicative modelling has identified that the new consent will require tighter consent conditions to prevent a deterioration in water quality and to ensure compliance with the Water Framework Directive, but that additional wastewater treatment infrastructure can be provided subject to Environment Agency approval of a new discharge consent, and Ofwat approval for funding for additional wastewater treatment infrastructure.

A larger map is shown on the next page.

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Comments	Estimated lead time to completion following confirmation of BP funding (Yrs)
Bedford	2010 -15 (AMP 5)	46669	17/6/(1)	Investment will include the required orbital sewer upgrades triggered by the Southern development. Any solution may have to incorporate flows from Marston Moretaine and Stewartby in the longer term.	3

Bedford WwTW wastewater effluent flood risk

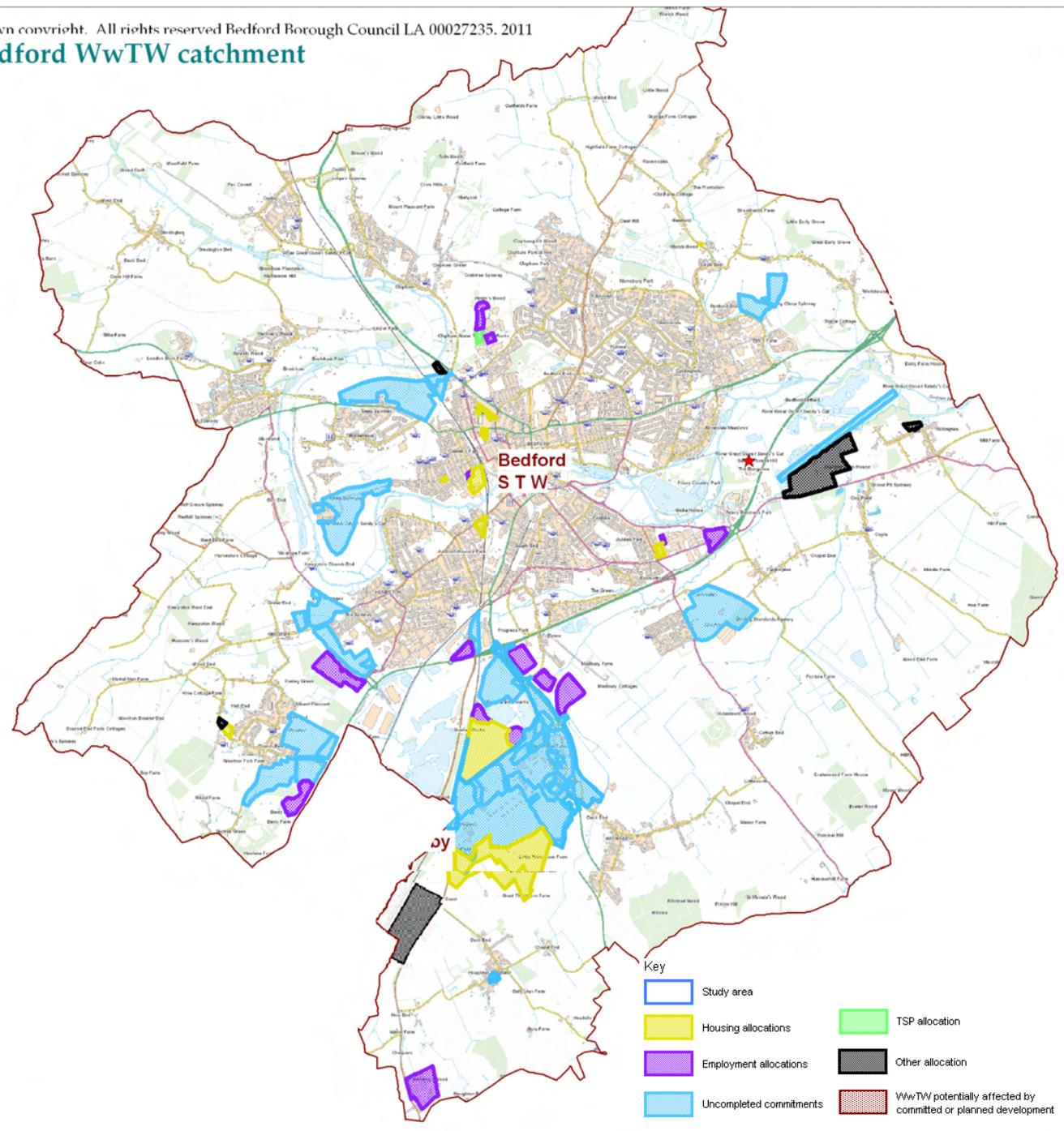
The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The risk at Bedford is calculated as being medium, primarily due to the position of Bedford itself on the River Ouse. The additional effluent will increase river flow by less than 0.5% in a 1 in 2 year (50% annual exceedance probability event), from 83.441m³/s to 83.803m³/s. If this risk needs to be considered further, we recommend that detailed modelling is undertaken using the Environment Agency detailed model of the River Ouse to quantify the impact of the additional flow as part of the consent considerations. Full details of the analysis can be found in Appendix A.

Bedford WwTW capacity conclusions

- Consent to be reviewed during AMP5
- If additional infrastructure is required to meet permit conditions following consent review, AWS to apply for supply demand funding for Bedford WwTW in PR14, to be delivered by 2020.

Bedford WwTW catchment

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Bedford wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment	Risks & dependencies
Bedford Borough			
377 St Bedes School, Bromham Road, Bedford Housing – 80 units (poss extra care)	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
83 Dallas Road, Bedford Housing – 122 units	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
376 Forrester Foods site, Old Ford End Road, Bedford Housing – 10 units	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
60 Land at Ford End Road, Bedford Housing – 200 units	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
68 Land rear of Eastcotts Road, Bedford Housing – 50 units	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
68 Land rear of Eastcotts Road, Bedford Housing – 50 units (possibly also 4 small B1 start up units)	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
191 Wixams northern expansion Housing – 1050 units	WW network RED	Strategic solution required. Up to 5 years solution design and Water Industry funding approval, not including construction time.	None identified
191 Wixams northern expansion Housing – 1050 units Employment – 9.5 ha	WW network RED	Strategic solution required. Up to 5 years solution design and Water Industry funding approval, not including construction time.	None identified
44 Land at Hall End Road, Wootton Housing – 50	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
24 Apex site, Cardington Cross, Bedford B1,B2,B8 site (inc hotel)	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
22 Land north of A603, Cardington Rd, Bedford Park and ride provision. Poss lorry park.	WW network RED	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development	None identified

Bedford wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment	Risks & dependencies
78 Reservoir site, Manton Lane, Bedford Small units, gen industry (B2 and B8). 45% plot ratio gives 1.5ha.	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
176 Land at Bell Farm, Kempston B1 (a,b and c) and B8 space at plot ratio of 40% = 7.2ha.	WW network RED	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development	None identified
150 Land at Medbury Farm, Elstow 31ha B1 business park use	WW network RED	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development	None identified
67 Land r/o Manton Lane, Bedford Small B1/B2 units. No detail given – say half of the site is developable (based on Louise's landscape work). Using 45% plot ratio this gives approx 3ha.	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
195 Land at Fields Road, Wootton 10ha. Business Park space (B1 a,b and c and B2) at plot ratio of 40% = 4ha.	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
165 Land at Bedford Road, Great Barford 0.4ha Primary Care facility	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
165 Land at Bedford Road, Great Barford 0.4ha Primary Care facility 50 residential units	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
209 Land at The Lakes, Wyboston 8 chalets	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
209 Land at The Lakes, Wyboston Shop/cafe	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
257 Land north of Ravensden Road, Salph End, Renhold 2 affordable housing units	WW network RED	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development	None identified
223 Land off Church Road, Willington Say 6 holiday lodges and extension to school grounds	WW network RED	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development	None identified

Bedford wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment	Risks & dependencies
63 Land at Manton Lane Eight plots for travelling showpeople	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
Lansdowne Road, Warwick Avenue & Dynevor Rd, Bedford 220-240 residential units	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
Land West of B360 3.4ha	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified
Land at Cut Throat Lane, Bedford 1.15 ha of hotel	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion.	None identified

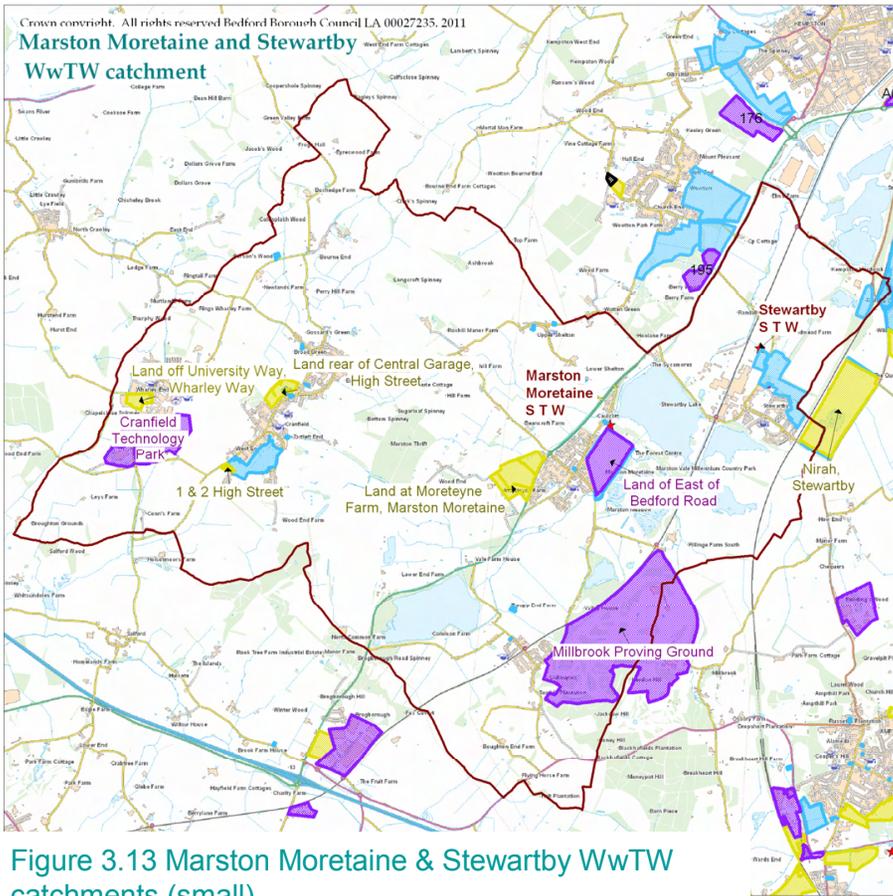


Figure 3.13 Marston Moretaine & Stewartby WwTW catchments (small)

Marston Moretaine and Stewartby STW

Based on current forecast housing allocation and commitments, both Stewartby and Marston Moretaine will require a review of consent during AMP5 (2010 – 2015).

Indicative modelling has identified that the new consents will require tighter consent conditions to prevent a deterioration in water quality and to ensure compliance with the Water Framework Directive.

It may not be possible to achieve these standards At Stewartby WwTW with conventionally applied wastewater treatment techniques, and it is uncertain that novel technology is either sustainable or feasible. Therefore it may be necessary to transfer some or all the flows to Marston Moretaine WwTW. Our water quality modelling has identified that this would be possible, and would not require a wastewater quality more stringent than can be achieved with current conventional wastewater treatment technology.

Cont. on next page

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Comments	Estimated lead time to completion following confirmation of BP funding (Yrs)
Marston Moretaine	2015 -20 (AMP 6)	2910	16/8/1.6	The investment type will be dependant upon the Stewartby development completing and the rate and certainty around the MM catchment growth. As development completes it may be necessary to plan in the longer term for all flows to transfer to Bedford Stw.	5
Stewartby	2010 -15 (AMP 5)	536	7/3 (0.8)	The development rate for this catchment will influence the timing of any combined (with Marston M) solution. However, should the level of development within the catchment not trigger the proposed permit conditions it is likely that the works will remain operational in its current form.	5

Marston Moretaine & Stewartby WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent will increase river flow by less than 0.5% in a 1 in 2 year (50% annual exceedance probability event), from 4.439m³/s to 4.457m³/s at Marston Moretaine. At Stewartby the increase to river flow is by 0.3% in a 1 in 2 year event from 2.830m³/s to 2.837m³/s. The risks at Marston Moretaine & Stewartby are calculated as being low with no further action necessary. Full details of the analysis can be found in Appendix A.

Marston Moretaine and Stewartby WwTW capacity conclusions

The WwTW consents for Marston Moretaine and Stewartby need to be reviewed during AMP5. Our modelling suggests that there is a feasible option to achieve WFD standards, therefore water quality should not be a constraint to the development tested in this WCS. There may be alternative options to ensure capacity for development that do not require new infrastructure, and AWS and the EA will determine the most sustainable option to deliver the WFD requirements and treatment capacity through consent review.

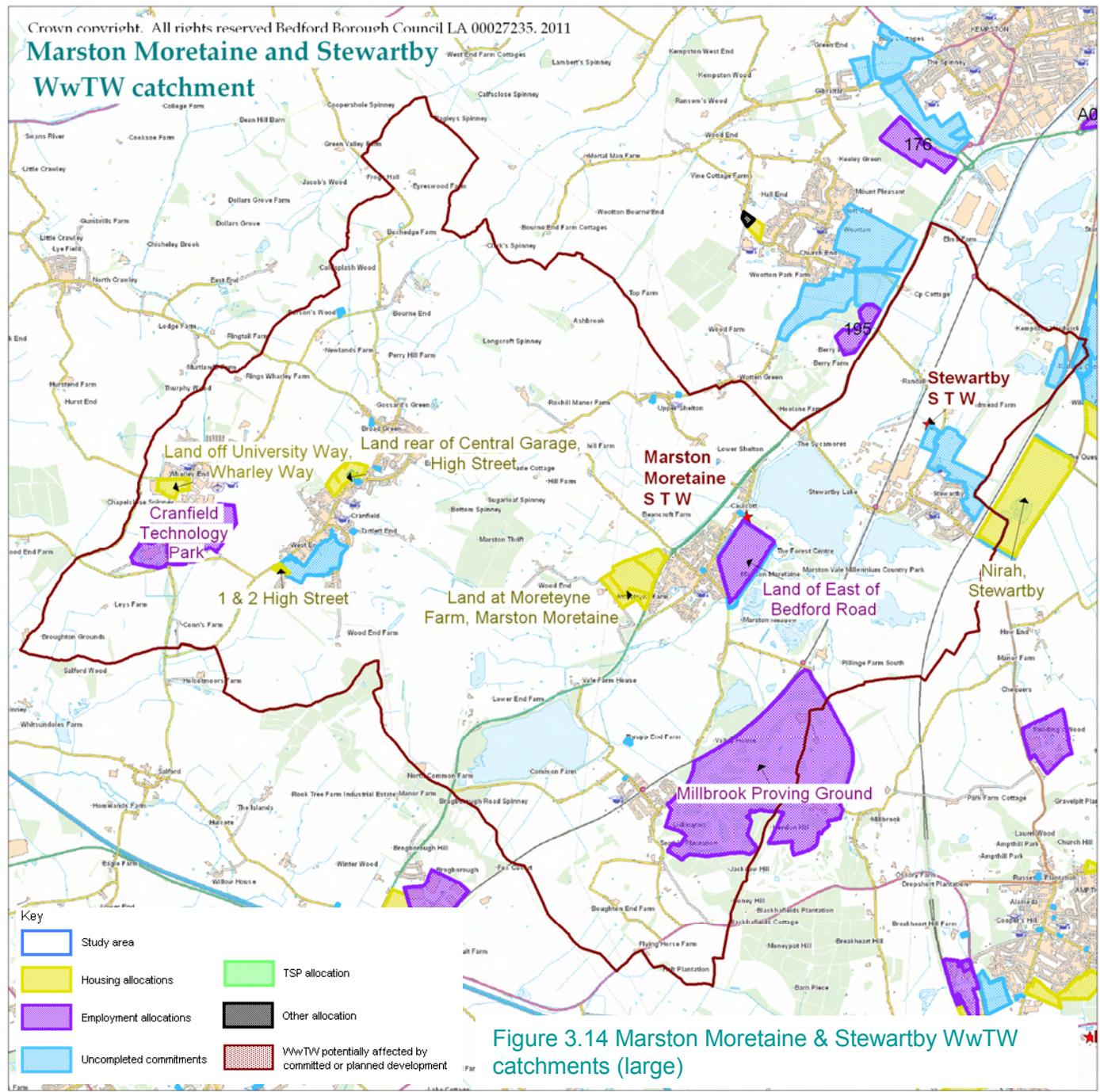


Figure 3.14 Marston Moretaine & Stewartby WwTW catchments (large)

Marston and Stewartby wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Central beds		
Cranfield		
H040 Land Rear of Central Garage, High Street, Cranfield 135 dwellings and doctors surgery (doctors surgery has been granted planning permission) Housing	The additional housing would not preclude this site, so should be amber. Surface water connection will be subject to the Anglian Water policy at the time of application and will be on a site specific basis.	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
H105 Land at Cranfield Airfield, Cranfield University, Cranfield 425 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
H180 Land at East End Farm, Bedford Road, Cranfield 106 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
E82 Land west of University Way, and Wharley Lane, Wharley End, Cranfield High quality business units potentially for research and development uses Employment	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
Marston Moretaine		
E09 Land at Moreteyne Farm, Marston Moretaine 160 dwellings and B1c (Light Industrial) and B2 (General Industrial) Mixed Use	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
Brogborough		
E15 Land between A421 and Marston Gate Distribution Park B8 (Storage or Distribution) Employment	This site would certainly drain to cotton valley. Surface water connection will be subject to the Anglian Water policy at the time of application and will be on a site specific basis.	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Tempsford WwTW

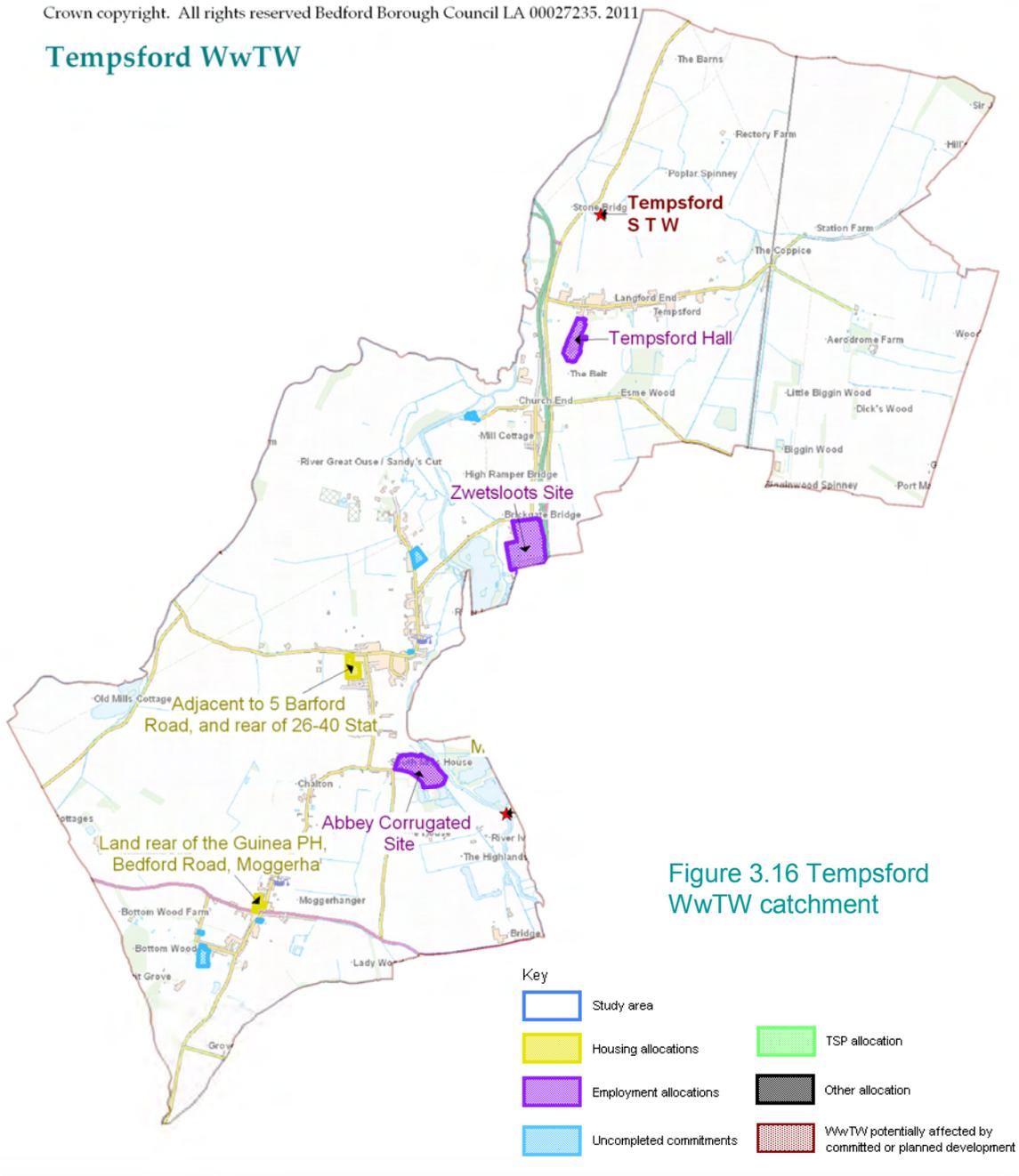


Figure 3.16 Tempsford WwTW catchment

Tempsford WwTW

Based on current forecast housing allocation and commitments, Tempsford WwTW will require a new discharge consent by year 2015.

Indicative river modelling has not been able to be undertaken because of a lack of monitoring data on the receiving water course. The level of development forecast to connect to this WwTW is small, with the population connected forecast to increase by only 2.5%, and, based on this, it is not expected that any new consent would be significantly tighter than the current consent. Anglian Water have advised that only minor wastewater treatment infrastructure changes will be required to serve the proposed development in Tempsford, and there is no lead time required.

Tempsford WwTW

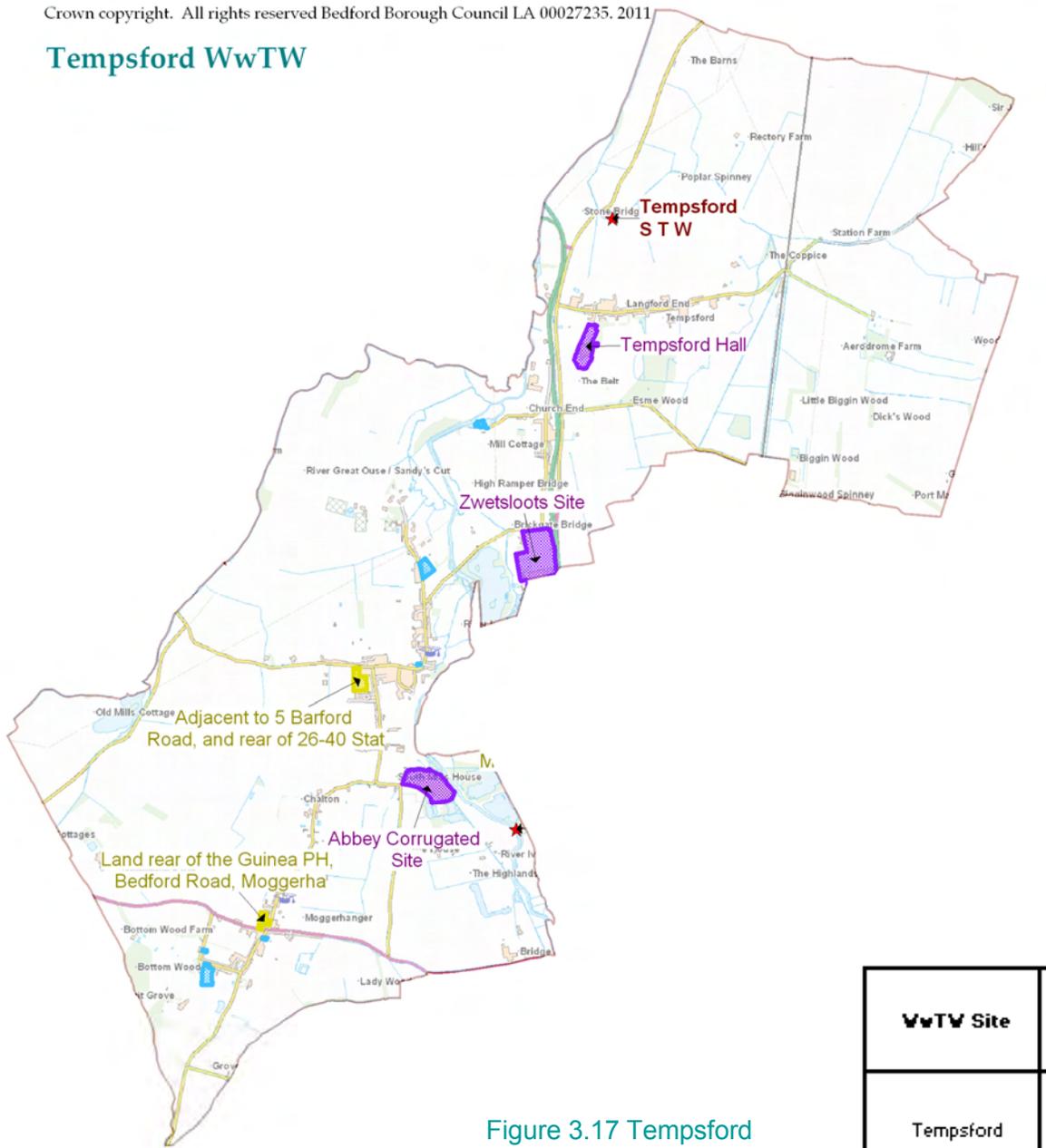


Figure 3.17 Tempsford WwTW catchment

Tempsford WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent will increase river flow by less than 0.05% in a 1 in 2 year (50% annual exceedance probability event), from 3.060m³/s to 3.062m³/s. The risk at Tempsford is calculated as being low with no further action required. Full details of the analysis can be found in Appendix A.

Tempsford WwTW capacity conclusions

Anglian Water have advised that only minor wastewater treatment infrastructure changes will be required to serve the proposed development in Tempsford, and there is no lead time required.

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Estimated lead time to completion following confirmation of BP funding (Yrs)
Tempsford	2010 -15 (AMP 5)	844	No change (2010/NA)	0

Tempsford wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Mogerhanger		
H273 Land rear of St Johns Road, Mogerhanger 43 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Everton WwTW

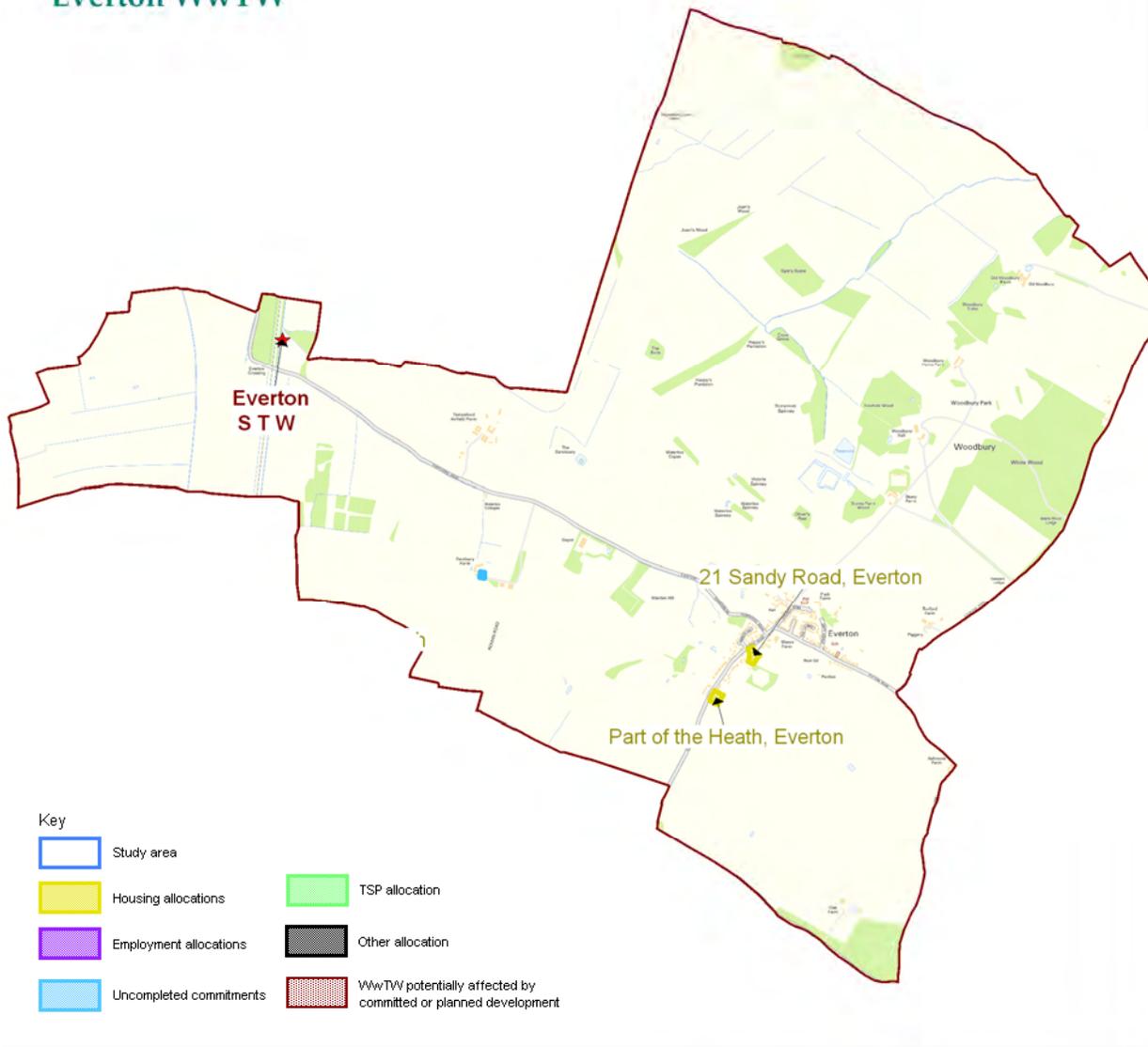


Figure 3.19 Everton WwTW catchment

Everton WwTW

Everton WwTW has consented capacity for development forecast until 2026.

Indicative river modelling has not been undertaken and no further assessment is necessary.

Everton wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Everton		
H243a The Recreation Ground, Potton Road, Everton 44 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
H245 Manor Farm, Everton 22 dwellings Housing	WW network RED	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow for appraisal works. Likely to require some form of modelling and solution development

Great Barford WwTW

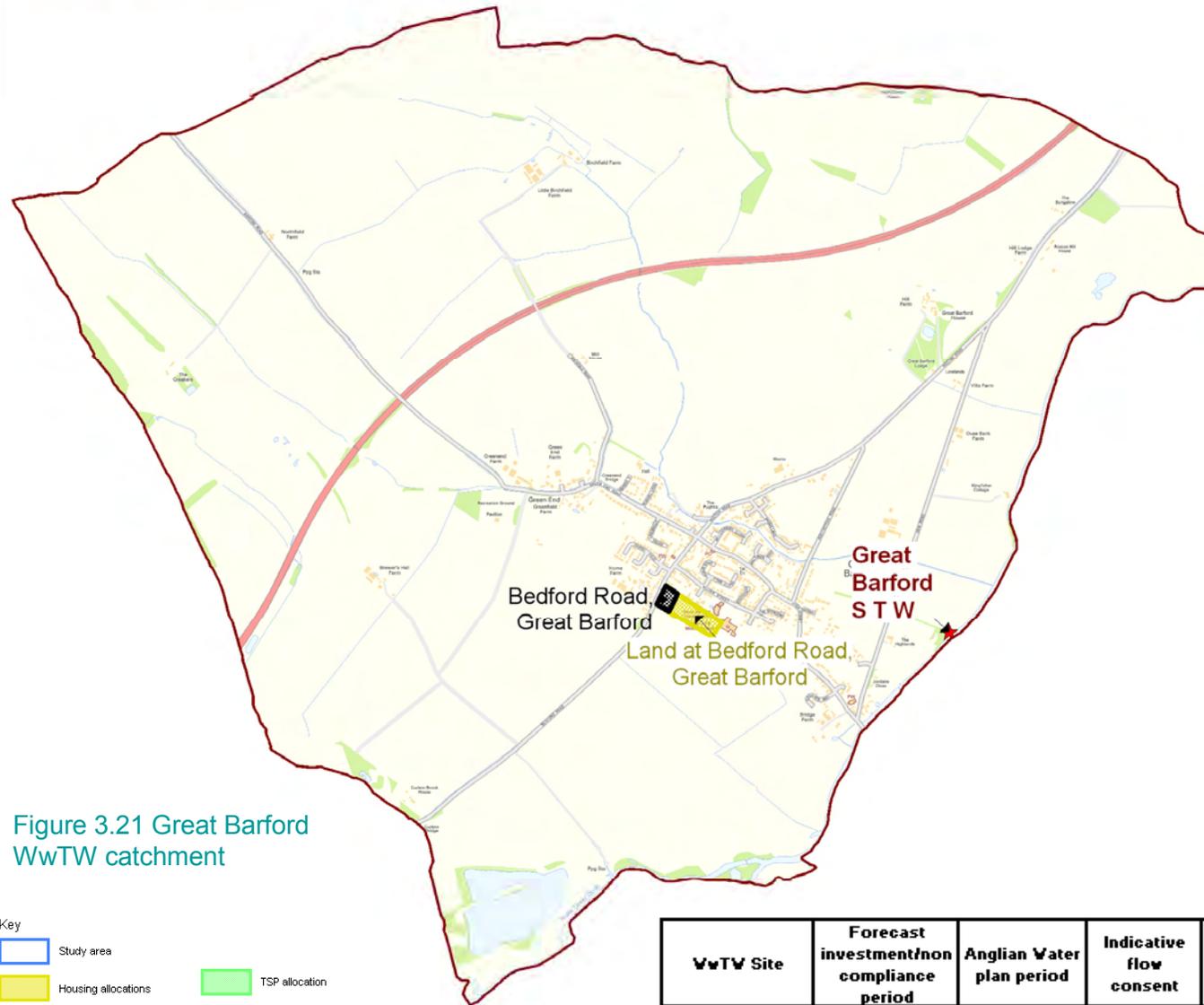


Figure 3.21 Great Barford WwTW catchment

Key

	Study area		TSP allocation
	Housing allocations		Other allocation
	Employment allocations		WwTW potentially affected by committed or planned development
	Uncompleted commitments		

WwTW Site	Forecast investment/non compliance period	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Comments	Investment type	Estimated lead time to completion following confirmation of BP funding (Yrs)
Great Barford	2015 (AMP 6)	2010 -15 (AMP 5)	510	No change 50/30/..		E	0

Investment types (Ww treatment)
E - minor optimisation such as control changes.

Great Barford WwTW

Based on current forecast housing allocation and commitments, Great Barford WwTW will require a new discharge consent by year 2015.

Great Barford is a small WwTW discharging to a large river (the Great Ouse). Indicative river modelling has been undertaken and the modelling identifies that no change is needed to the existing quality consent conditions to ensure no deterioration of the downstream waterbody. The modelling has also identified that development at the level forecast will not have an impact on the future achievement of good ecological status on the river.

Anglian Water have advised that only minor wastewater treatment infrastructure changes will be required to serve the proposed development in Great Barford, and there is no lead time required.

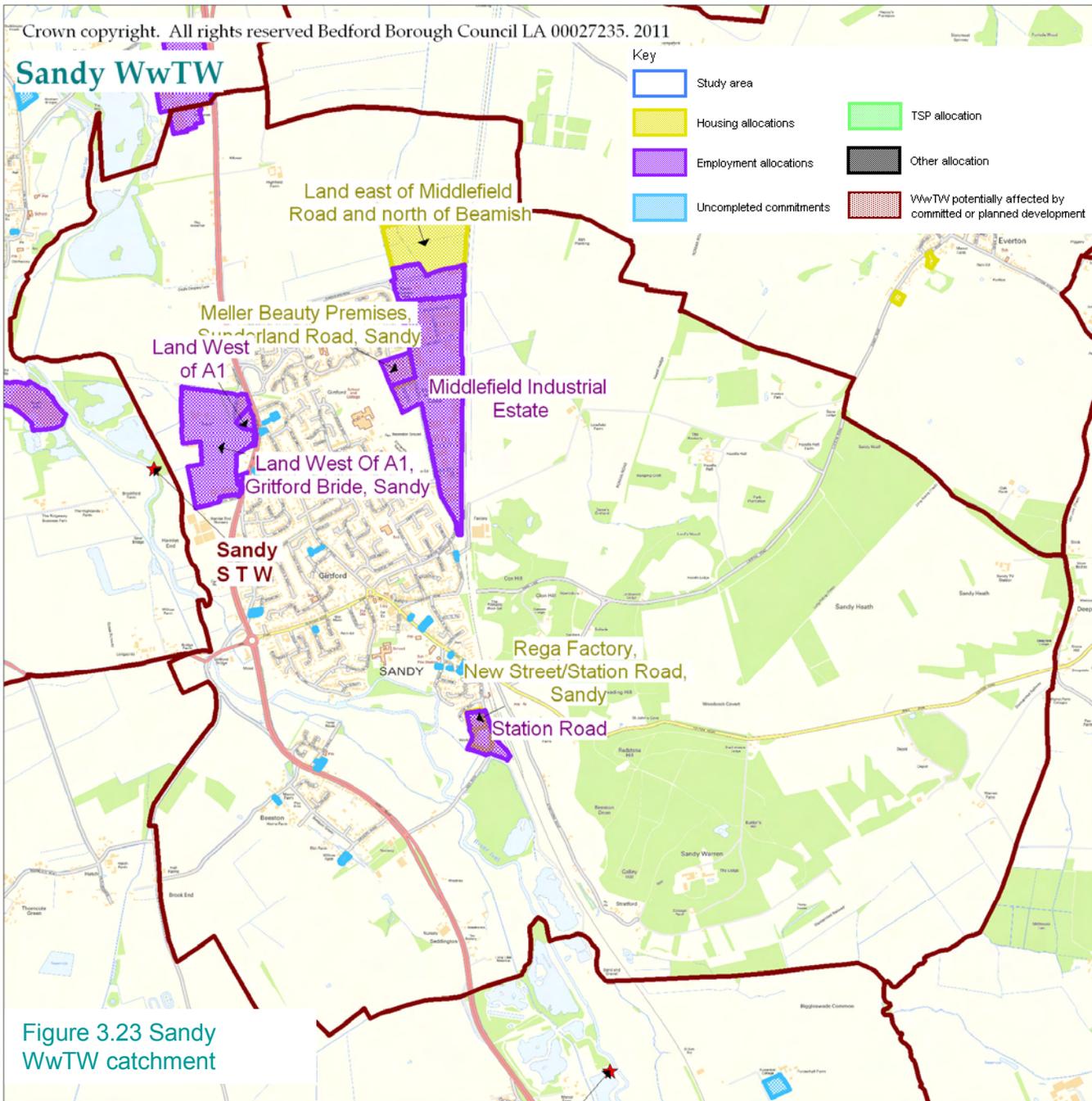
Great Barford wastewater network infrastructure assessment

All allocations in Great Barford Catchment were identified as 'green' for wastewater infrastructure by Anglian Water.

Great Barford WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent increase river flow is negligible in a 1 in 2 year (50% annual exceedance probability event), from the current value of 91.560m³/s. The risk at Great Barford is calculated as being low with no further action required. Full details of the analysis can be found in Appendix A.





Sandy WwTW

Based on current forecast housing allocation and commitments Sandy WwTW will require a review of consent during AMP5 (2010 – 2015).

Sandy WwTW is a small WwTW discharging to a large river (the Great Ouse). Indicative river modelling has been undertaken and the modelling identifies that no change is needed to the existing quality consent conditions to ensure no deterioration of the downstream waterbody. The modelling has also identified that development at the level forecast will not have an impact on the future achievement of good ecological status on the river.

Anglian Water have advised that only minor wastewater treatment infrastructure changes will be required to serve the proposed development in Sandy, and there is no lead time required.

Sandy WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent will increase river flow by 0.01% in a 1 in 2 year (50% annual exceedance probability event), from 18.410m³/s to 18.412m³/s. The risk at Sandy is calculated as being low, with no further action required. Full details of the analysis can be found in Appendix A.

Sandy wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Central beds		
Sandy		
E38 Land North of Beamish Close B1, B2 and B8 (5ha) Employment	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Potton WwTW

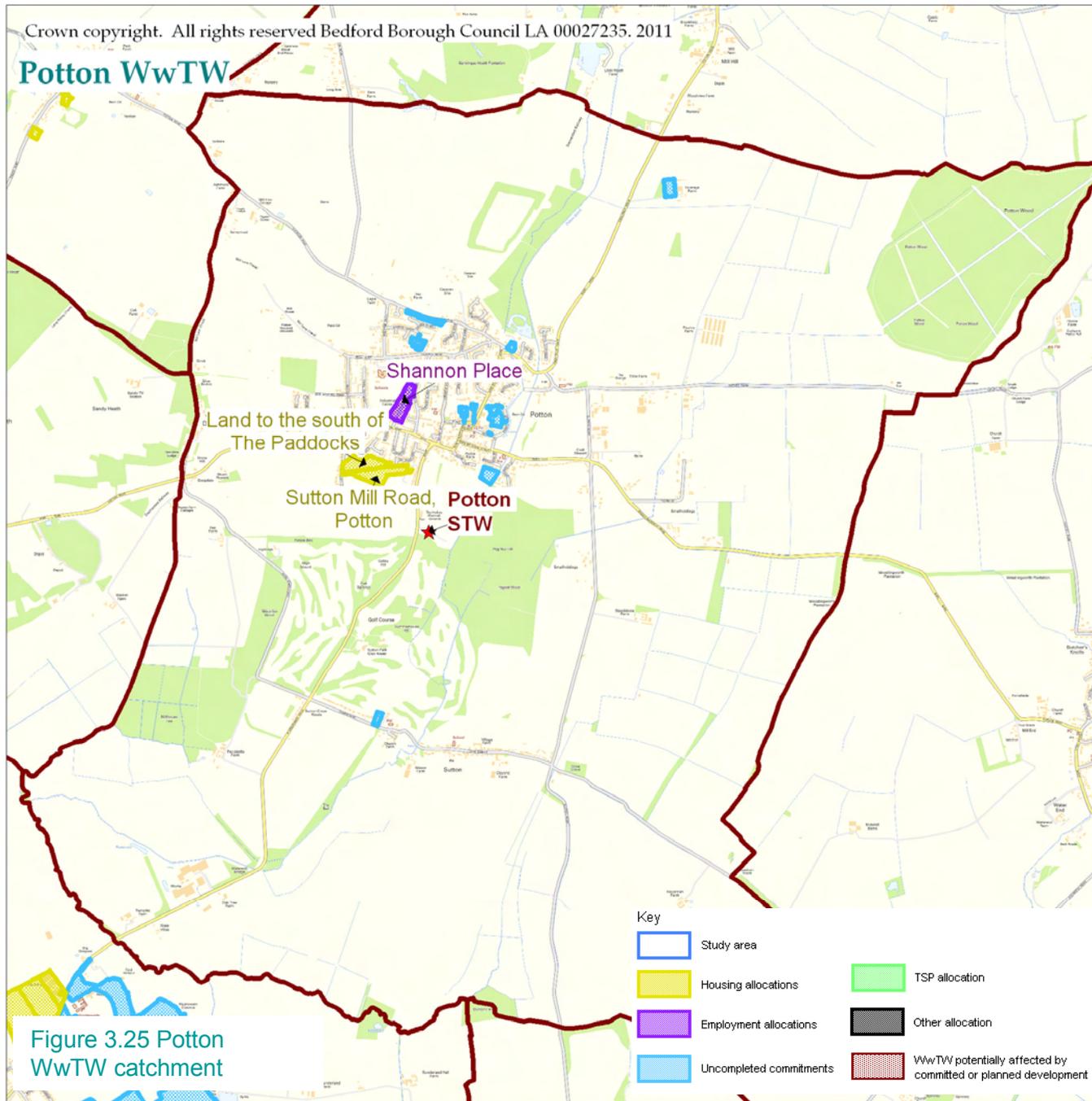


Figure 3.25 Potton WwTW catchment

Potton WwTW

Potton WwTW has consented capacity for development forecast until 2026.

However, water quality modelling suggests that there is risk of water body deterioration identified by this assessment means that development should conform to high sustainable standards.

Potton wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Potton		
H266 Land rear of Everton Road, Potton 39 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
H356 Land to the South of 'The Paddocks', Potton 46 dwellings Housing	Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Biggleswade WwTW

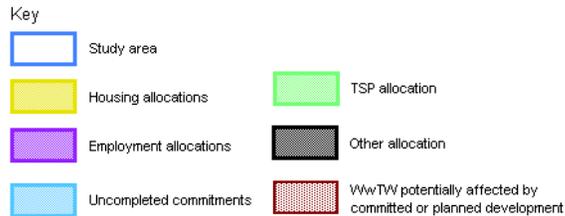
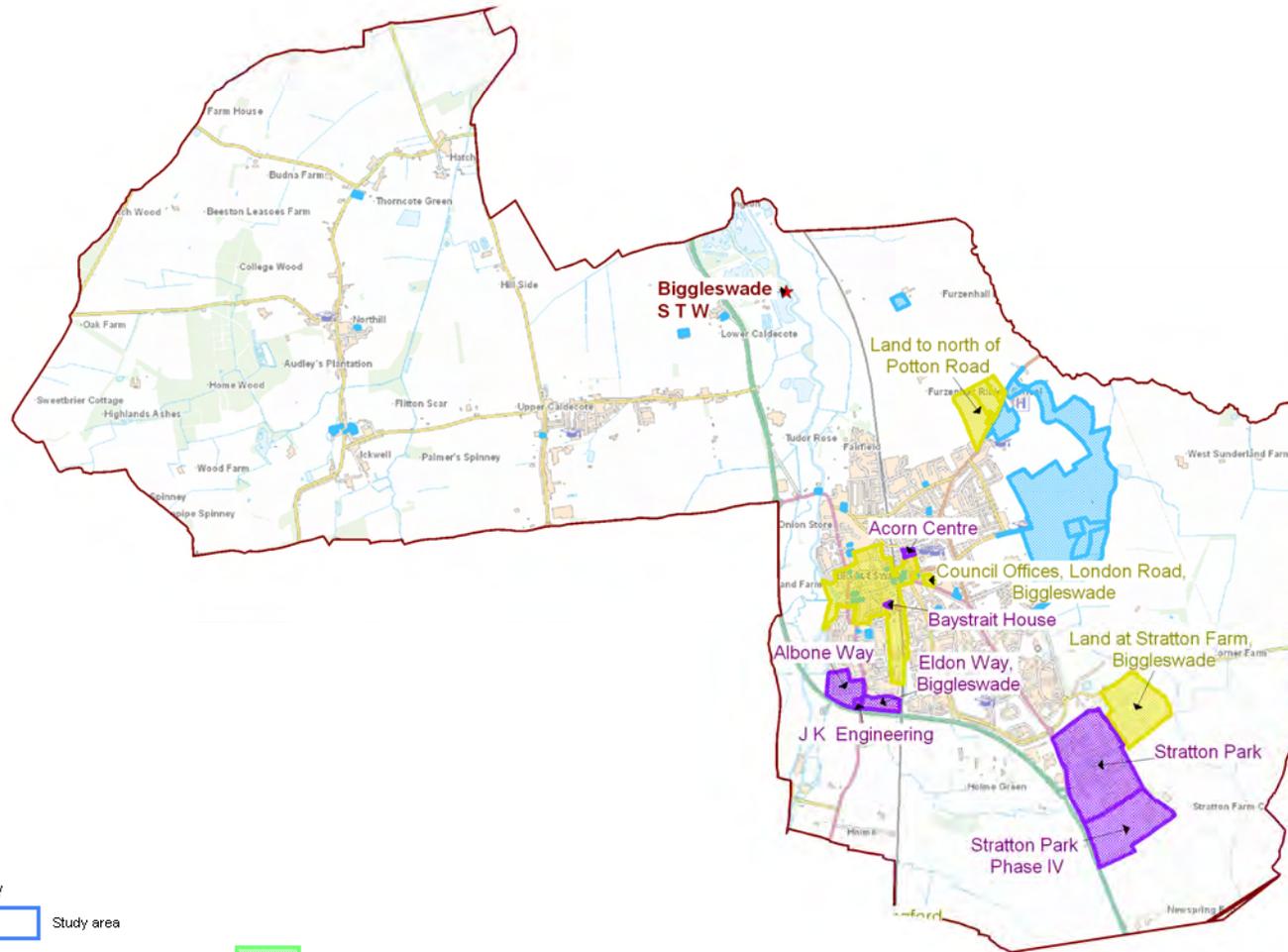


Figure 3.27 Biggleswade WwTW catchment

Biggleswade WwTW

Based on current forecast housing allocation and commitments Biggleswade WwTW will require a review of consent during AMP5 (2010 – 2015). Indicative modelling has identified that the new consent will require tighter consent conditions to prevent a deterioration in water quality and to ensure compliance with the Water Framework Directive, but that additional wastewater treatment infrastructure can be provided subject to Environment Agency approval of a new discharge consent, and Ofwat approval for funding for additional wastewater treatment infrastructure.

There is a residual risk of deterioration in phosphate status even if new wastewater treatment capacity is provided.

Biggleswade WwTW

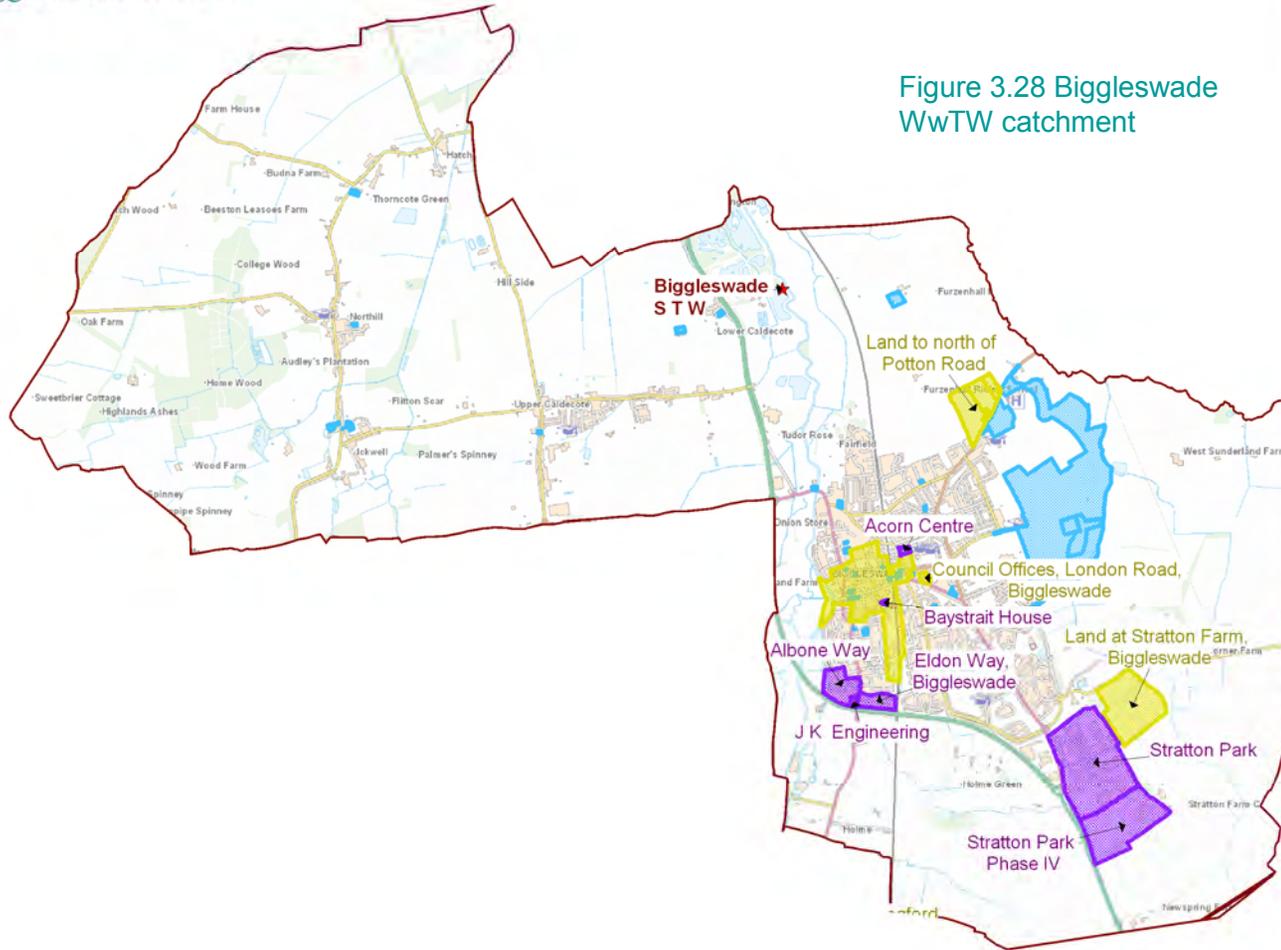


Figure 3.28 Biggleswade WwTW catchment

Biggleswade WwTW capacity conclusions

Anglian Water have advised that major extensions to the wastewater treatment infrastructure would be required to meet the indicative consent conditions, which would require a lead time of approximately four years following funding being agreed.

There may be more sustainable or cost effective options to delivering additional wastewater treatment capacity and meeting Water Framework Directive obligations than the provision of additional infrastructure requirements. Examples could include retrofit demand management measures in existing urban areas, or through removal of surface water from the foul drainage system. These alternative measures could also be used to mitigate the risk of WFD classification deterioration in phosphate status.

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Estimated lead time to completion following confirmation of BP funding (Yrs)
Biggleswade	2010 -15 (AMP 5)	5313	25/4.75 (2)	4

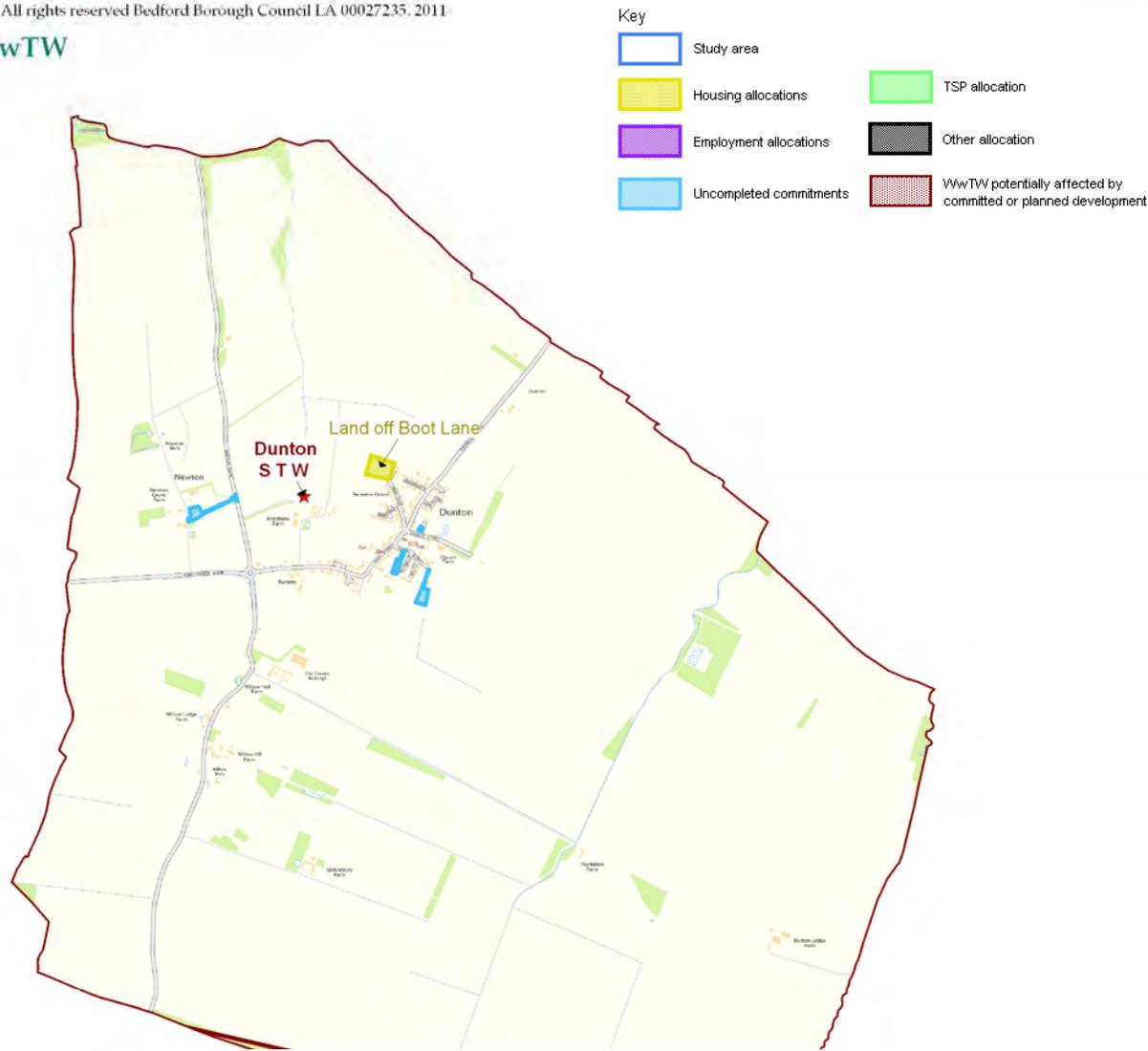
Biggleswade WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent will increase river flow by less than 0.2% in a 1 in 2 year (50% annual exceedance probability event), from 17.625m³/s to 17.654m³/s. The risk at Biggleswade is calculated as being low, with no further action necessary. Full details of the analysis can be found in Appendix A.

Biggleswade wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Biggleswade		
H347 Land at Potton Road 330 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Dunton WwTW



- Key
- Study area
 - Housing allocations
 - Employment allocations
 - Uncompleted commitments
 - TSP allocation
 - Other allocation
 - WwTW potentially affected by committed or planned development

Dunton WwTW

Based on current forecast housing allocation and commitments Dunton WwTW will require a review of consent during AMP5 (2010 – 2015).

Indicative river modelling has not been able to be undertaken because of a lack of monitoring data on the receiving water. The level of development forecast to connected to this WwTW is small, with the population connected forecast to increase by only 3%, and, based on this, it is not expected that any new consent would be significantly tighter than the current consent.

Anglian Water have advised that only minor wastewater treatment infrastructure changes will be required to serve the proposed development in Dunton, and there is no lead time required.

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Estimated lead time to completion following confirmation of BP funding (Yrs)
Dunton	2010 -15 (AMP 5)	246	No change (20/10/NA)	0

Figure 3.30 Dunton WwTW catchment

Dunton WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent will increase river flow by less than 0.2% in a 1 in 2 year (50% annual exceedance probability event), from 0.150m³/s. The risk at Dunton is calculated as being low, with no further action required. Full details of the analysis can be found in Appendix A.

Dunton wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Dunton H192 Land off Boot Lane, Dunton 15 dwellings Housing	Still red. Surface water connection will be subject to the Anglian Water policy at the time of application and will be on a site specific basis.	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow for appraisal works. Likely to require some form of modelling and solution development

Poppyhill WwTW

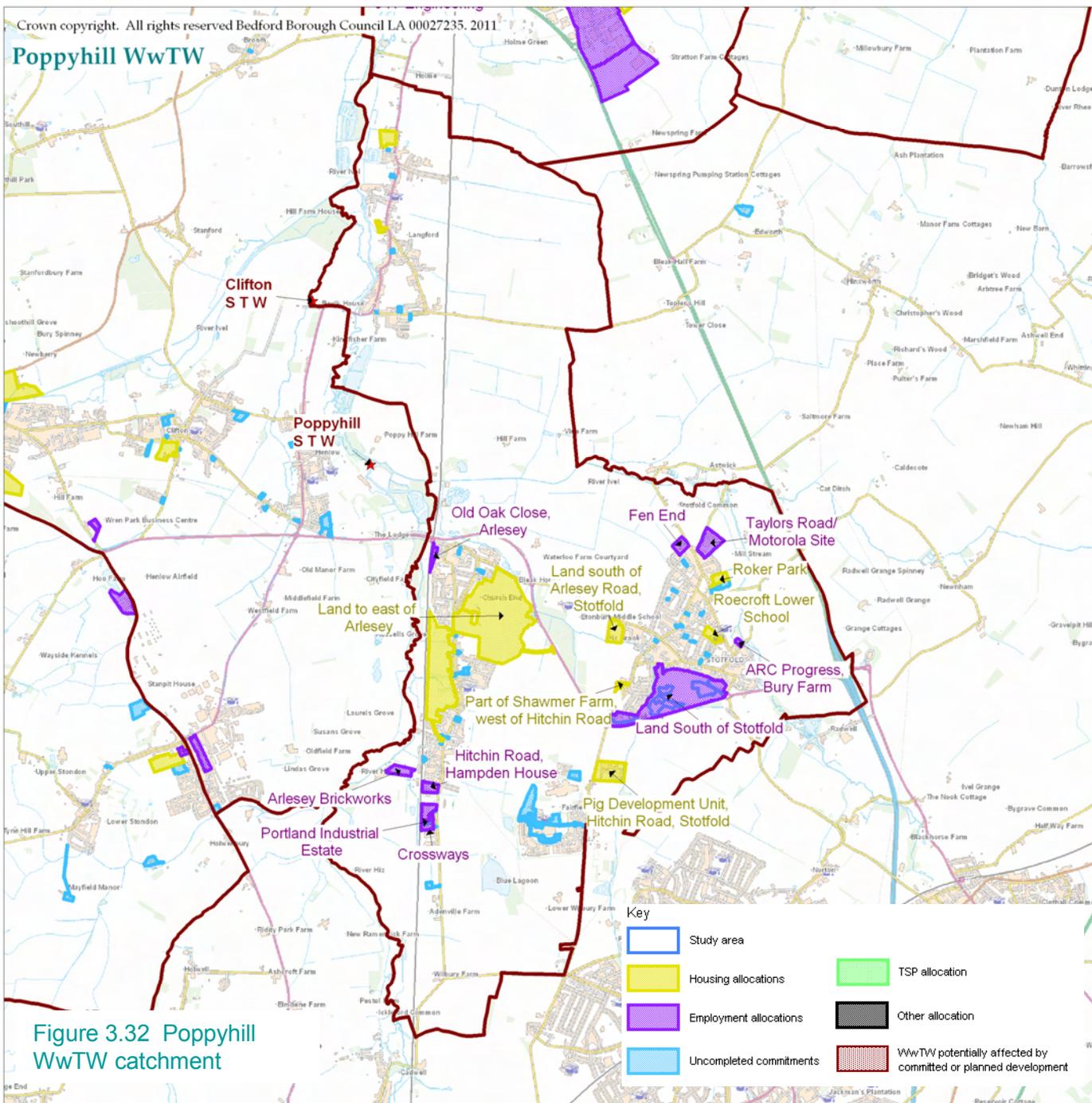


Figure 3.32 Poppyhill WwTW catchment

Poppyhill WwTW

Based on current forecast housing allocation and commitments Poppyhill WwTW will require a review of consent during AMP5 (2010 – 2015). Indicative modelling has identified that the new consent will require tighter consent conditions to prevent a deterioration in water quality and to ensure compliance with the Water Framework Directive, but that additional wastewater treatment infrastructure can be provided subject to Environment Agency approval of a new discharge consent, and Ofwat approval for funding for additional wastewater treatment infrastructure.

Poppyhill WwTW

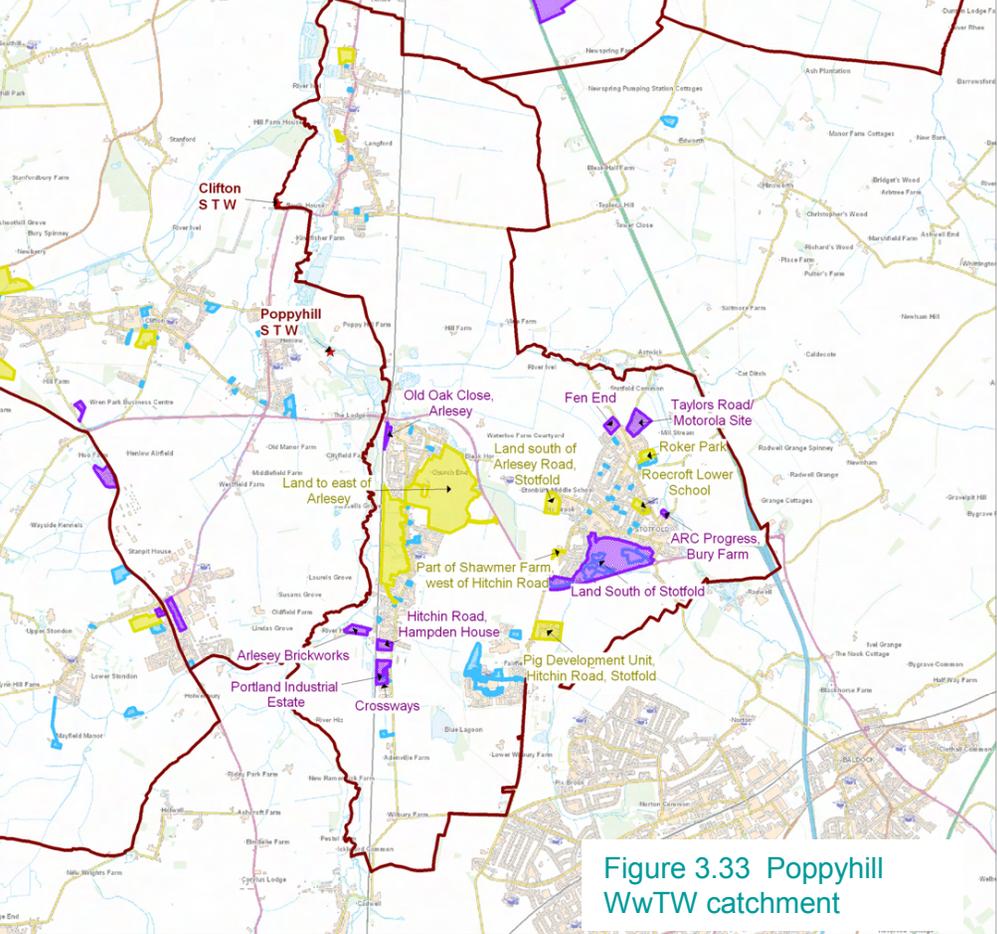


Figure 3.33 Poppyhill WwTW catchment

Poppyhill WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. The additional effluent will increase river flow by less than 0.5% in a 1 in 2 year (50% annual exceedance probability event), from 7.058m³/s to 7.083m³/s. The risk at Poppyhill is calculated as being low with no further action required.

Full details of the analysis can be found in Appendix A.

Poppyhill WwTW capacity conclusions

Anglian Water have advised that major wastewater treatment infrastructure improvements will be required to achieve the modelled consent standards. This infrastructure would take approximately 5 years to deliver once funding has been agreed.

There may be more sustainable or cost effective options to delivering additional wastewater treatment capacity and meeting Water Framework Directive obligations than the provision of additional infrastructure. Examples could include retrofit demand management measures in existing urban areas, or through removal of surface water from the foul drainage system. These alternative measures could also be used to mitigate the risk of WFD classification deterioration in phosphate status.

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total)	Comments	Estimated lead time to completion following confirmation of BP
Poppyhill	2010 -15 (AMP 5)	7068	20/1.49 (1.57)	The proposed Ammonia limit is particularly challenging and may not be achievable using conventional treatment methods. As a result the options for this site will require thorough evaluation as will the eventual cost /benefit.	5



Poppyhill wastewater network infrastructure assessment

Site	Former consultation comments to draft Sitre Allocations DPD	WCS assessment
Stotfold		
H056 Land South of Malthouse Lane, Stotfold 120 dwellings Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
H260 Land at Arleseey Road, Stotfold 85 dwellings and small scale B1/commercial Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
Arleseey		
H293 West and East to High Street, Arleseey 1000 houses with community facilities, retail and relief road Mixed Use	WW network RED	Strategic solution required. Up to 5 years for solution design and Water Industry funding approval, not including construction time. There will be a dependance on the timing of these works with any proposed solution for the treatment works at Poppyhill
E12a Land at Chase Farm, Arleseey 0 dwellings and B1 (Offices and Light Industrial) around 5 - 10 Ha Employment	Providing flows are of a domestic nature, this site should be amber. Surface water connection will be subject to the Anglian Water policy at the time of application and will be on a site specific basis.	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
Langford		
H232 Land at 88 Church Street, Langford 81 dwellings Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
H252 Land to the West of Langford 122 dwellings Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
E04 Land Rear of Church Street 32 dwellings and B1 (office) Mixed Use	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development

Clifton WwTW

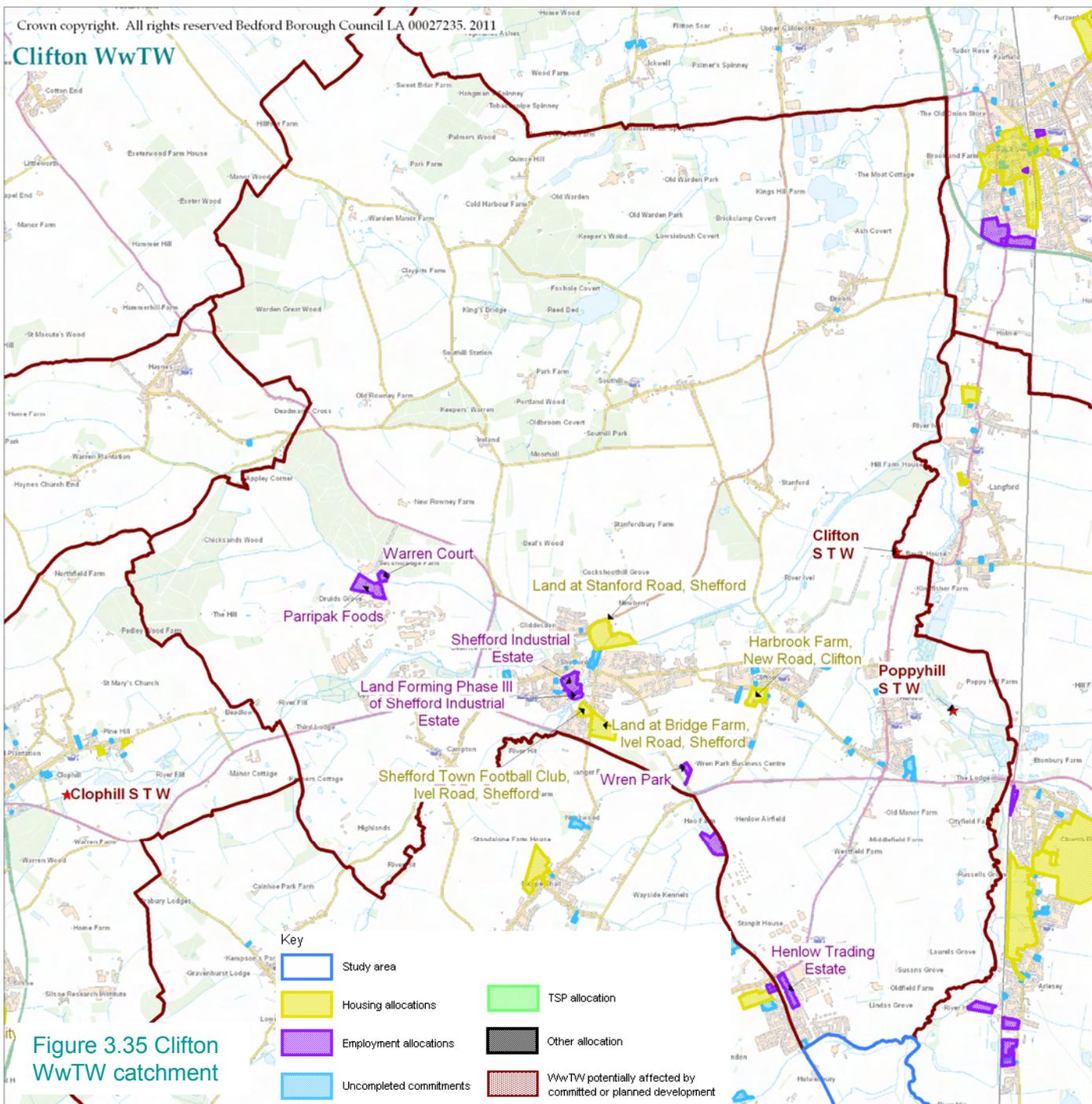


Figure 3.35 Clifton WwTW catchment

Clifton WwTW

Clifton WwTW has consented capacity for development forecast until 2026.

However, water quality modelling suggests that there is risk of water body deterioration identified by this assessment means that development should conform to high sustainable standards.

Clifton wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Sheffield		
H019/H171 Bridge Farm (and adjoining land), Ivel Road, Sheffield Development of 70 dwellings and small scale B1 (business) employment use Mixed Use	Amber due to capacity limitations. Surface water connection will be subject to the Anglian Water policy at the time of application and will be on a site specific basis.	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
H055 Land off Stanford Road, Sheffield 133 dwellings Housing	RED, no comments	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
Henlow		
H046 Land at Clifton Road, Henlow 155 dwellings Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
H264 Land at Northfield Farm, Henlow 140 dwellings Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
E75 Henlow Aggregates, Arlesey Road, Henlow B1 (Office, Light Industry) Employment	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development

Clophill WwTW

Clophill WwTW

Clophill WwTW has consented capacity for development forecast until 2026.

No further assessment is therefore needed.

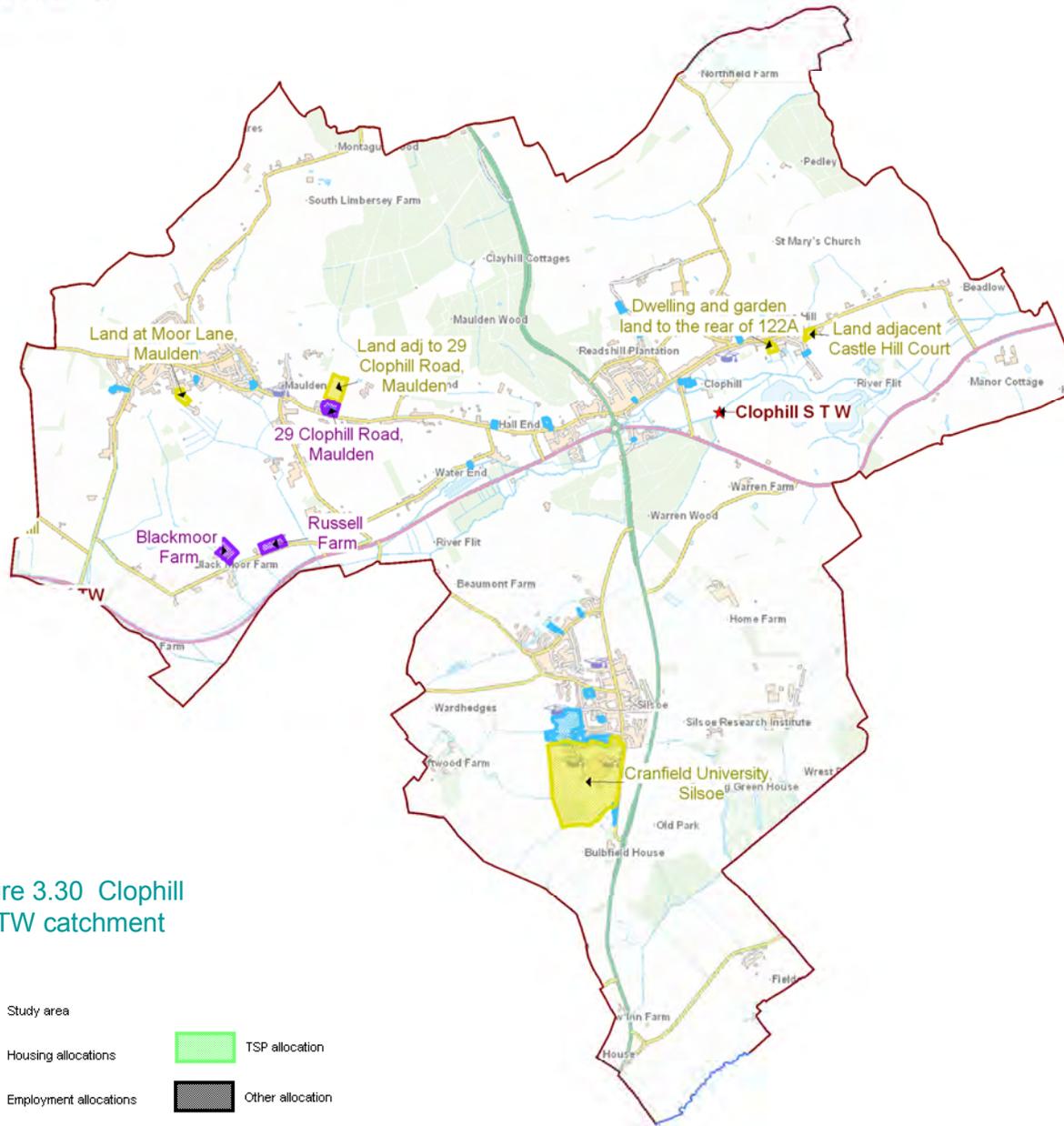


Figure 3.30 Clophill WwTW catchment

Clophill wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Malden		
H050/H116 Land at The Brache, Malden 98 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Shillington WwTW

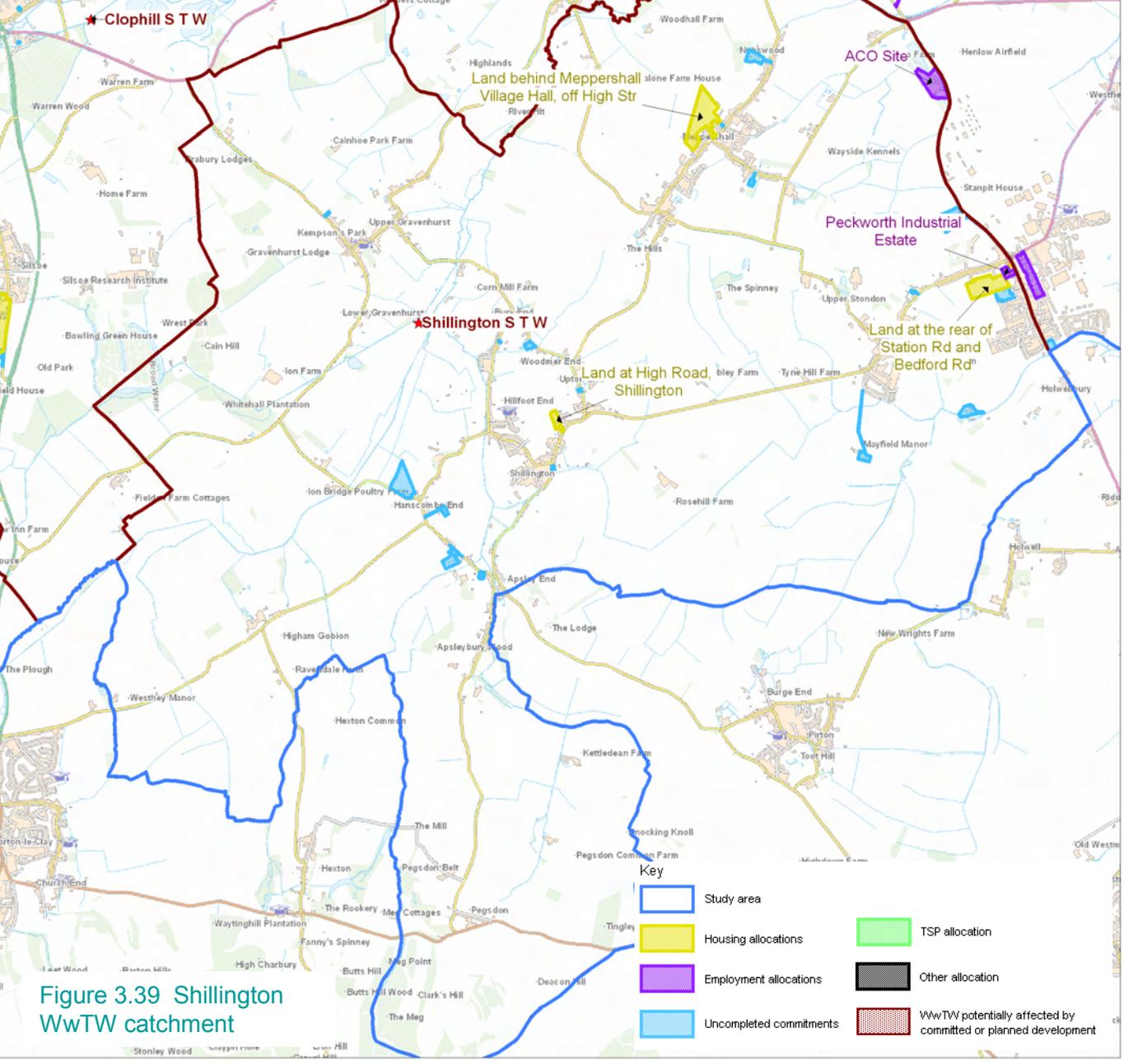


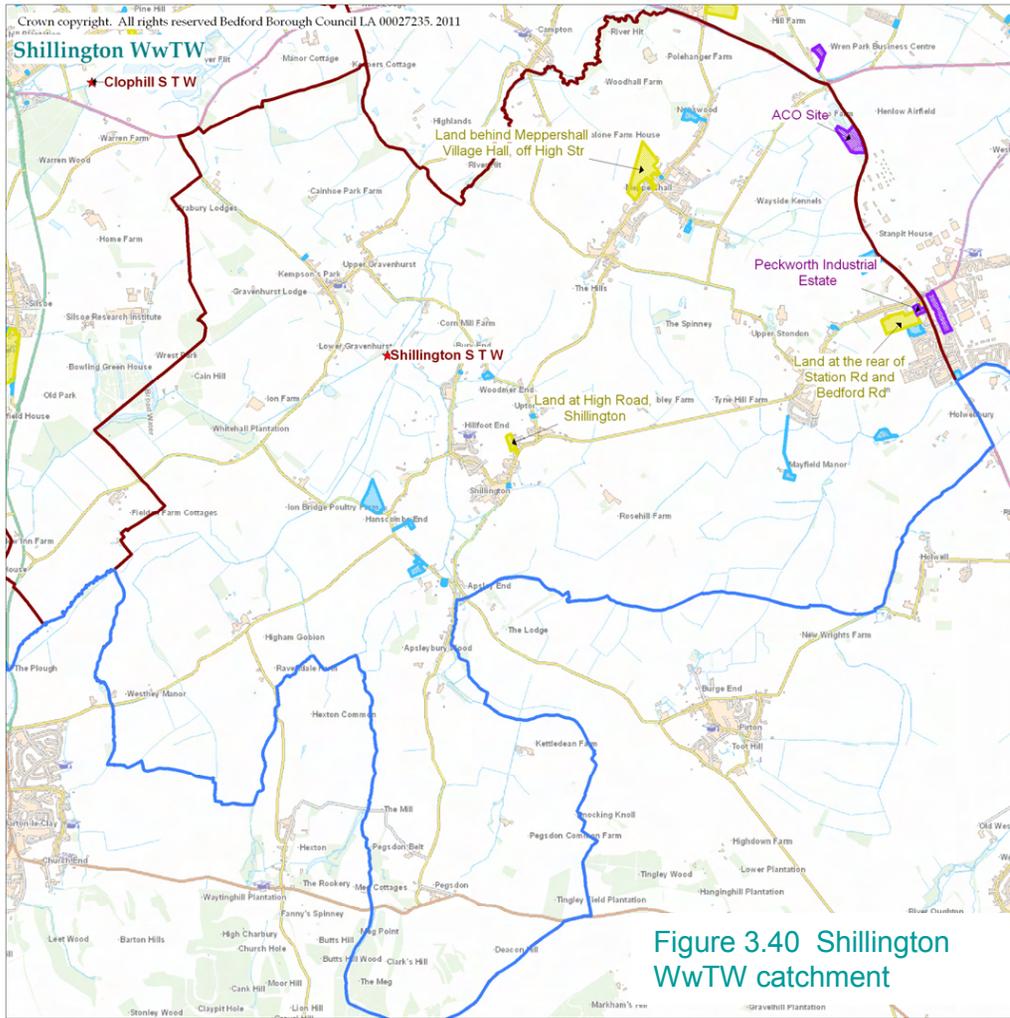
Figure 3.39 Shillington WwTW catchment

Shillington WwTW

Based on current forecast housing allocation and commitments Shillington WwTW will require a review of consent during AMP5 (2010 – 2015).

Indicative modelling has identified that the new consent will require tighter consent conditions to prevent a deterioration in water quality and to ensure compliance with the Water Framework Directive, but that additional wastewater treatment infrastructure can be provided subject to Environment Agency approval of a new discharge consent, and Ofwat approval for funding for additional wastewater treatment infrastructure.





Shillington WwTW wastewater effluent flood risk

The impact of additional treated effluent on flood risk has been assessed according to a methodology developed with the Environment Agency and Anglian Water Services. There is no increase in the river flow from Shillington WwTW. The risk at Shillington is calculated as being low, with no further action required.

Full details of the analysis can be found in Appendix A.

Shillington WwTW capacity conclusions

Anglian Water have advised that major wastewater treatment infrastructure improvements will be required to achieve the no deterioration consent standards. This infrastructure would take approximately three years to deliver once funding has been agreed.

There may be more sustainable or cost effective options to delivering additional wastewater treatment capacity and meeting Water Framework Directive obligations than the provision of additional infrastructure requirements. Examples could include retrofit demand management measures in existing urban areas, or through removal of surface water from the foul drainage system.

WwTW Site	Anglian Water plan period	Indicative flow consent	Indicative quality consent BOD/Ammonia (total phosphate)	Estimated lead time to completion following confirmation of BP funding (Yrs)
Shillington	2010 -15 (AMP 5)	1276	9/2(9)	3

Shillington wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Meppershall		
H174 Land behind Meppershall Village Hall, High Street, Meppershall 68 dwellings with community facilities Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
H034 Bury Nurseries, 100 High Street, Meppershall 52 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
H189 Land at Bury Farm, Meppershall Shefford Meppershall 42 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion
Gravenhurst		
H102 Oakridge, 13 Orchard Close Upper Gravenhurst 48 dwellings Housing	WW network Amber	Can be delivered through developer led requisition process. Normal Anglian Water Requisition process of 12 - 18 months to scheme completion

Flitwick wastewater network infrastructure assessment

Site	Former consultation comments to draft Site Allocations DPD	WCS assessment
Amphill H363 Land off Swaffield Close 39 dwellings Housing	WW network Amber	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development
Flitwick H077/E62 Land at Steppingley Road and Frognall Road 450 dwellings and B1 (office/industrial) Mixed Use	WW network Amber due to capacity limitations. Surface water connection will be subject to the Anglian Water policy at the time of application and will be on a site specific basis.	Extended requisition process. Scheme dependant; Applies to extended requisition process of up to 2 years prior to construction to allow appraisal works. Likely to require some form of modelling and solution development

Chapter Four – Water resources

Introduction

The purpose of this water resources and supply section of the detailed WCS is to provide a more thorough understanding of the current and future outlook for regional and local water resources and supply. This chapter focuses on whether sufficient water resource is available to support the planned level of growth, and what water supply infrastructure is needed. The assessment provides recommendations for development policies which can be adopted by local authorities to reduce water demand from new and existing housing stock and contribute to the sustainable management of water resources in the region.

The public water supply for the significant majority of the study area is supplied by Anglian Water Services (AWS), with Veolia Water central (formerly Three Valleys Water Services) supplying the housing development on the grounds of the former Fairfield's Hospital to the South of the study area by inset agreement with Ofwat.

AWS provides both water and wastewater services in the UK to approximately six million industrial, commercial and domestic customers. The AWS region is divided into 12 Water Resource Zones (WRZs) and 82 Planning Zones (PZs), 21 of which lie in the Ruthamford WRZ. The relevant WRZ for this study area's growth is the Ruthamford WRZ. This is the largest WRZ in the Anglian network and is named after the integrated water resources and supply system formed by the use of Rutland Water, Grafham Water and Pitsford reservoirs. The zone includes the smaller surface water source works at Ravensthorpe reservoir and on the Bedford Ouse. It also includes the groundwater sources abstracting from the Woburn Sands aquifer. These provide water to a large area which includes Peterborough, Huntingdon, Corby, Kettering, Bedford, Wellingborough, Northampton, Milton Keynes and Daventry. The Ruthamford system also indirectly supplies the towns of Luton and Stevenage in the Veolia Water supply area and the market town of Oakham in the Severn Trent Water supply area through bulk supplies.



Water resources environmental limits

Environmental availability of water is assessed by the Environment Agency through the Catchment Abstraction Management (CAMS) Strategies and the WFD River Basin Management Plans.

The bulk of the study area falls within the Upper Ouse and Bedford Ouse CAMS region, with an area of 3,000km² and covering the Great Ouse catchment and a number of its tributaries down to Earith. A small section of the study area to the North falls within the Nene CAMS region, and a small area to the East falls within the Cam and Ely Ouse CAM region.

The EA assesses the status of water resource based upon a combination of separate surface water and groundwater assessments. The majority of the Upper Ouse and Bedford Ouse CAMS have been designated as *no water available*. Approximately half of the study area falls within this designation, while the other half is divided between *Over-abstracted* and *Over-licensed* (see map below).

The EA also assessed relative water stress across England in 2007. The water stress method takes a long-term view of the balance between water availability and the demand for public water supply, rather than a snapshot of shorter or peak periods, and is designed to support but not replace established water resources planning processes. This assessment shows that the study area (1) falls in a region of serious relative water stress. Therefore, water resource and the management of demand for water is a critical issue for development management in the study area.

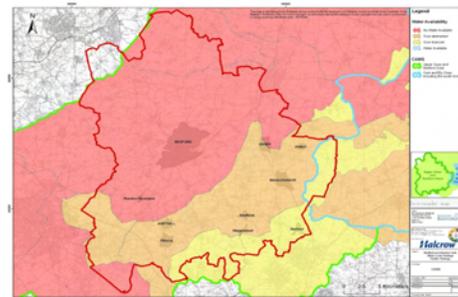


Figure 4.2b. CAMS water availability. [Click here for full size map](#)

1. Anglian Water
2. Bournemouth and West Hampshire Water
3. Bristol Water
4. Cambridge Water
5. Essex and Suffolk Water
6. Folkestone and Dover Water
7. Mid Kent Water
8. Northumbrian Water
9. Portsmouth Water
10. Severn Trent Water
11. South East Water
12. South Staffordshire Water
13. South West Water
14. Southern Water
15. Sutton and East Surrey Water
16. Tendring Hundred Water
17. Thames Water
18. Three Valleys Water
19. United Utilities
20. Wessex Water
21. Yorkshire Water
22. Anglian Water (formerly Hartlepool Water)

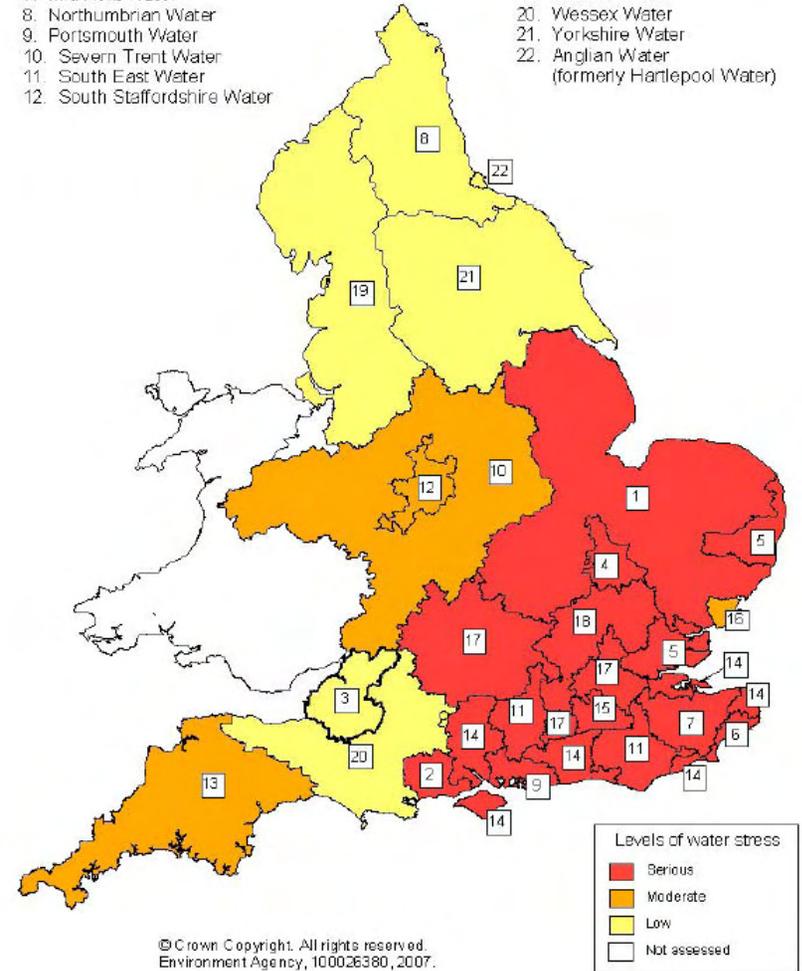
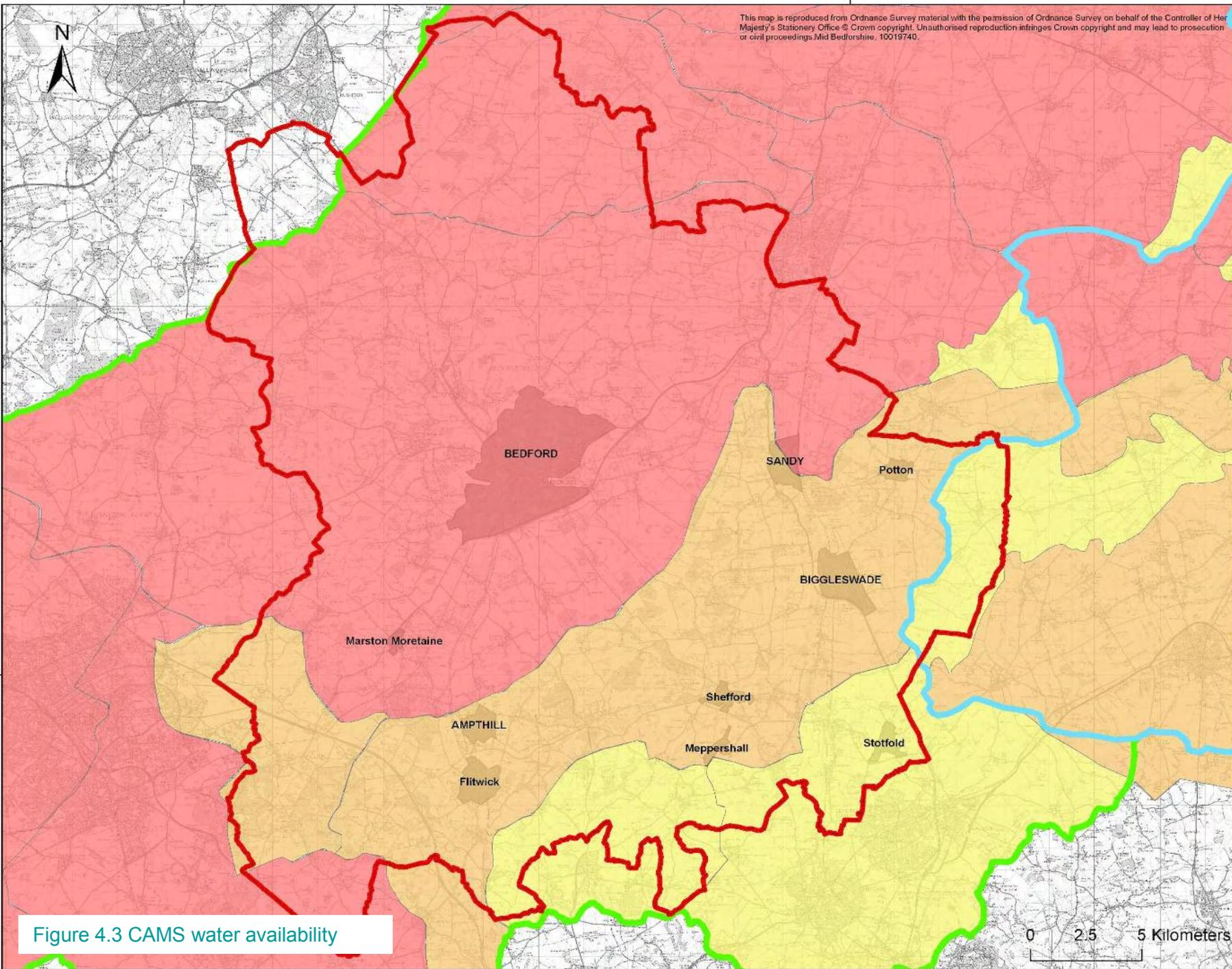


Figure 4.2a Areas of relative water stress (Environment Agency 2007)

490000

520000

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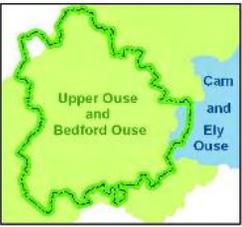
Legend

Water Availability

- No Water Available
- Over-abstracted
- Over-licensed
- Water Available

CAMS

- Upper Ouse and Bedford Ouse
- Cam and Ely Ouse including the south level



Drawn by:	Checked by:	Approved by:	Drawn by:	Checked by:	Approved by:
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Project:
**Bedford and Marston Vale
 Water Cycle Strategy
 Outline Strategy**

Drawing:
CAMS

Drawn by:	Checked by:	Approved by:	Drawn by:	Checked by:	Approved by:
ANK					

Drawing Scale: N/A/A3

Figure 4.3 CAMS water availability



Water resources management planning

The CAMS status of no water available, over licensed or over abstracted means that it is unlikely that water companies will be able to obtain new abstraction licences within the study area to meet increases in demand or which can be relied upon to provide security in times of drought.

However, water resources and public water supply are managed by the EA and the water companies at a regional, rather than at a local level. Therefore, because of the way in which water resources are currently and planned managed across the entire Ruthamford Zone (see map below), this is not necessarily a constraint to development. To understand this, it is necessary to explain water company water resources management planning in a little more detail.

As the appointed water company, AWS has a responsibility to provide sufficient quantity and quality of water to meet the needs of its customers, whilst also minimising their impacts on the environment. This responsibility also applies to new customers and population growth, as well as changing demands within the existing customer base and so must be comprehensively planned for.

All water companies have a duty to produce water resources management plans (WRMP) covering the next 25 years. These plans set out how companies intend to provide sufficient water to meet their customers' needs. Although not previously compulsory, companies have prepared 25 year water resource management plans on a voluntary basis, and shared these with the Government and regulators, since 1999.

On 1 April 2007 these plans became compulsory under changes to the Water Industry Act 1991, and are now also subject to public consultation before they are finalised. Information regarding the strategic water resources for the study area has been obtained from AWS's Water Resources Management Plan: Main Report, February 2010. This uses data from 2006/07 as the baseline and forecasts supply and demand up to 2034/35.

Whilst strategic plans for meeting future demand over a 25 year period are set out in the WRMP, the detailed design of schemes is not undertaken until works have been granted funding by Ofwat. Any improvements to the water services infrastructure needs to be programmed into a water company's capital programme, which runs in five year Asset Management Plan (AMP) cycles. The AMP4 period covered 2005-2010 and we are now in the AMP5 period (2010 – 2015), therefore water companies have received the final determination of their business plan by Ofwat, which determines its allowable capital expenditure for AMP5 (2010-2015).



Figure 4.4 Ruthamford WRZ

Anglian Water's water resources strategy

AWS currently provides potable water to approximately six million customers of which approximately 1.5 million live within the Ruthamford WRZ. AWS further divide WRZ's into planning zones (PZs), as shown in the map below. The water cycle study areas falls within the Bedford, Clapham, Newport Pagnell, Woburn, Biggleswade and Meppershall PZs.

AWS planning standards

Through consultation with customers, regulators, stakeholders and balanced with the needs of the environment, AWS has identified that the optimum level of service for water supply reliability should be based upon only imposing restrictions on supplies during a drought, this is based upon restrictions on:

- use of hosepipes not more than once in 10 years,
- use of Drought Orders to enforce restriction on non-essential uses and secure raw water resources not more than one in 40 years
- the imposition of the use of standpipes not more than one in 100 years.

The Final WRMP has been based upon delivery of this standard.

Investment between 2005 and 2010 has resulted in recent improvements to the water supply system and its security in the Ruthamford WRZ. This has addressed a deficit that was anticipated by 2010 by the implementation of a scheme to treat the remaining yield of Rutland Water, therefore there is a current surplus of water available in the WRZ.



Figure 4.5 Ruthamford WRZ

Meeting the demand from population growth and climate change

In the Final WRMP AWS have accounted for 22,000 new homes a year across the Ruthamford WRZ through the planning period amounting to over 560,000 new properties in total over 25 years for the whole of the AWS Region. This was revised from the Draft WRMP to take into account the economic downturn during 2008 represented by a decrease in growth rate at the start of the planning period and later catch up. This analysis is based, in part, on the regional spatial strategy housing requirements and has not been reviewed following the announcement that the RSSs are to be abolished.

An increase in the number of new homes will result in a growth in the number of customers and potentially in the overall demand for water. In forecasting water demand, population estimates are derived from official data from the Office of National Statistics (ONS) using the best available methods, in accordance with OFWAT reporting requirements.

The level of water demand from new homes is dependent upon the extent to which they are built to high standards of water efficiency and then the water-use behaviour of customers. AWS state in their WRMP that support from the planning system and all stakeholders is required in implementing the Government's growth strategy to ensure that all new homes are constructed to the highest possible standards of water efficiency to help conserve water.

Anglian Water have undertaken a detailed climate change impact assessment as part of the WRMP plan, looking at changes in rainfall, evaporation, and changes in consumer behaviour. Their analysis has concluded that the impact of climate change on supplies and demands during the next 25 years is not a significant driver for the WRMP. However climate change remains the biggest single risk to water supplies in the longer term and this is recognised in their Strategic Direction Statement (SDS). If business as usual continues over the WRMP period, there would be a deficit between supply and demand in a dry year by 2019/2020. However, the final WRMP strategy identifies a number of activities that will be needed to ensure the supply demand balance will remain positive until 2034/35.

AWS future strategy is twin track and requires the delivery of a number of supply side improvements alongside demand side improvements. Further detail is provided about the supply side schemes in Appendix A – Water resources paper. However, other than ensuring planning permission is granted where necessary, planning authorities and developers have little influence on the delivery of supply side schemes.

The delivery of demand management in new and existing development, however, may require support from planning authorities and requires developers to comply with water efficiency standards in new buildings. An action plan to promote and improve demand management can be found in [Appendix C](#).

Demand management and development management policies

Bedford Borough

The Bedford Borough Core Strategy and Rural Issues Plan sets out the long-term spatial vision for Bedford Borough up to 2021. It was adopted by the council in April 2008 and includes the following policy of relevance to water resources and efficiency.

Policy: CP26 Climate change and pollution.

The council will require development to:

v) As a minimum, meet the national standards for building performance set by the current Building Regulations. Through the Allocations and Designations DPD process the Council may identify local development or site specific opportunities which justify the adoption and application of higher standards of building performance as set out in the Code for Sustainable Homes. Such higher standards may also be required by the Council where justified by changes in national guidance.

vii) Incorporate facilities to minimise the use of water and waste; and,

viii) Limit any adverse effects on water quality, reduce water consumption and minimise the risk of flooding.

Developers will be expected to submit a sustainability statement and energy audit with proposals for development.

To guide the implementation of policy CP26 of the Council's Core Strategy and Rural Issues Plan the Climate Change and Pollution Supplementary Planning Document (SPD) was produced and adopted in December 2008. This non-statutory document provides guidance for developers and recommends in relation to water and flooding the minimum standards are adhered to by developers as detailed on the right.

- Ensure that all development has a water meter installed;
- Provide water butts for new residential units that have private gardens prior to occupation;
- Commercial development that includes areas of landscaping will be expected to make appropriate provision for collecting rainwater;
- Wherever possible, specify low water use fittings and appliances;
- Provide guidance to householders on how to conserve water; and
- Ensure that the design of buildings and their surrounding landscape maximises water efficiency and minimises water wastage.

In addition, the guidance recommends that developers:

- Provide a rainwater harvesting and 'grey water' recycling system as part of the development;
- Ensure that the design of surface water drainage systems take into account expected future changes in rainfall;
- Assess the amount of water likely to be used during the construction and operation of any development and identify opportunities to use water more efficiently; and
- Incorporate products and systems that detect leaking and burst pipes that either sound an alarm or shut off the water supply to reduce the amount of water wasted in a development.

Demand management and development management policies

Central Bedfordshire North Area

For the north area of Central Bedfordshire (previously the Mid Bedfordshire area) the Core Strategy and Development Management Policies Development Plan Document was adopted in November 2009 and will guide development to 2026. Policy CP 13 covers demand management for new development.

Policy: CS13 Climate Change.

The Council working with other stakeholders will secure new development.....which incorporate measures to take account of climate change.

Individual targets for new allocated developments may be set through the Site Allocations DPD where these can be justified by local circumstances taking account of economic viability.

The range of measures to be considered will include:

- The use of sustainable design and construction and high efficiency standards for all developments and refurbishments with residential schemes referring to the 'Code for Sustainable Homes' and all non residential schemes referring to BREEAM ratings (or its successor);
- Provision for conserving water resources and recycling water as well as limiting any adverse effects on water quality.
- Provision of sustainable water supply and drainage infrastructure.

The Development Plan Document also recognises that the demand for water will increase in tandem with the planned growth in homes and industry and that it is crucial that water is used efficiently in order to secure sufficient supplies.

The council recognises a need for new development to be as water efficient as possible and states that all new 'major' developments (i.e. 10 or more dwellings/0.5 ha or 1000 square metres for commercial proposals or 1 hectare or more) which will use white water should be aiming towards the conservation of water and as such, developers will be required to submit, as part of their planning application, a statement of how they intend to address this issue.

Policy DM2 requires that all new developments comply with the mandatory standards of the Code for Sustainable homes, and developers will need to provide evidence of how they intend to achieve this through the statement submitted with their planning application.

Policy: DM2: Sustainable Construction of New Buildings.

All proposals for new development should contribute towards sustainable building principles. Where the minimum standards are not met, evidence will be required to demonstrate why this would not be feasible or viable.

Future new housing development will be expected to comply with mandatory standards in relation to the Code for Sustainable Homes.

Non-residential buildings should comply with building regulations.

Major developments and developments which will have high water consumption should incorporate measures to minimise their use of 'white' water.

Water supply network infrastructure assessment methodology

Water supply network infrastructure

Anglian Water previously undertook a Red Amber Green assessment of both Local Authorities Site Allocations DPDs. A large number of allocations were classified as green, and therefore had available water supply network capacity to facilitate development without the requirement for further infrastructure provision. However, there were a number of sites which were identified as Amber and Red which required further assessment. The water cycle study, informed by AWS has undertaken a further assessment of the infrastructure requirements at these locations. This assessment has identified the scale of additional infrastructure that would be required to support each development site being assessed, what the source of funding for this infrastructure is likely to be, and the timescale for the delivery of infrastructure. Where a strategic solution is required and AWS have advised that funding through the developer requisition process is not viable, funding will be dependant on the scheme being identified and approved by Ofwat in AWS 2014 business plan.

Assessment results

The following results are subdivided into the project sub-areas. The water supply network assessment excludes those allocations that were identified as GREEN by Anglian Water in their consultation to the Site Allocations and Development Management DPDs.

You can navigate around the study area using the subareas catchment map on the next page.

You can return to the subarea map at any time by clicking on the chapter map icon in the bottom navigation bar below as highlighted on the right.



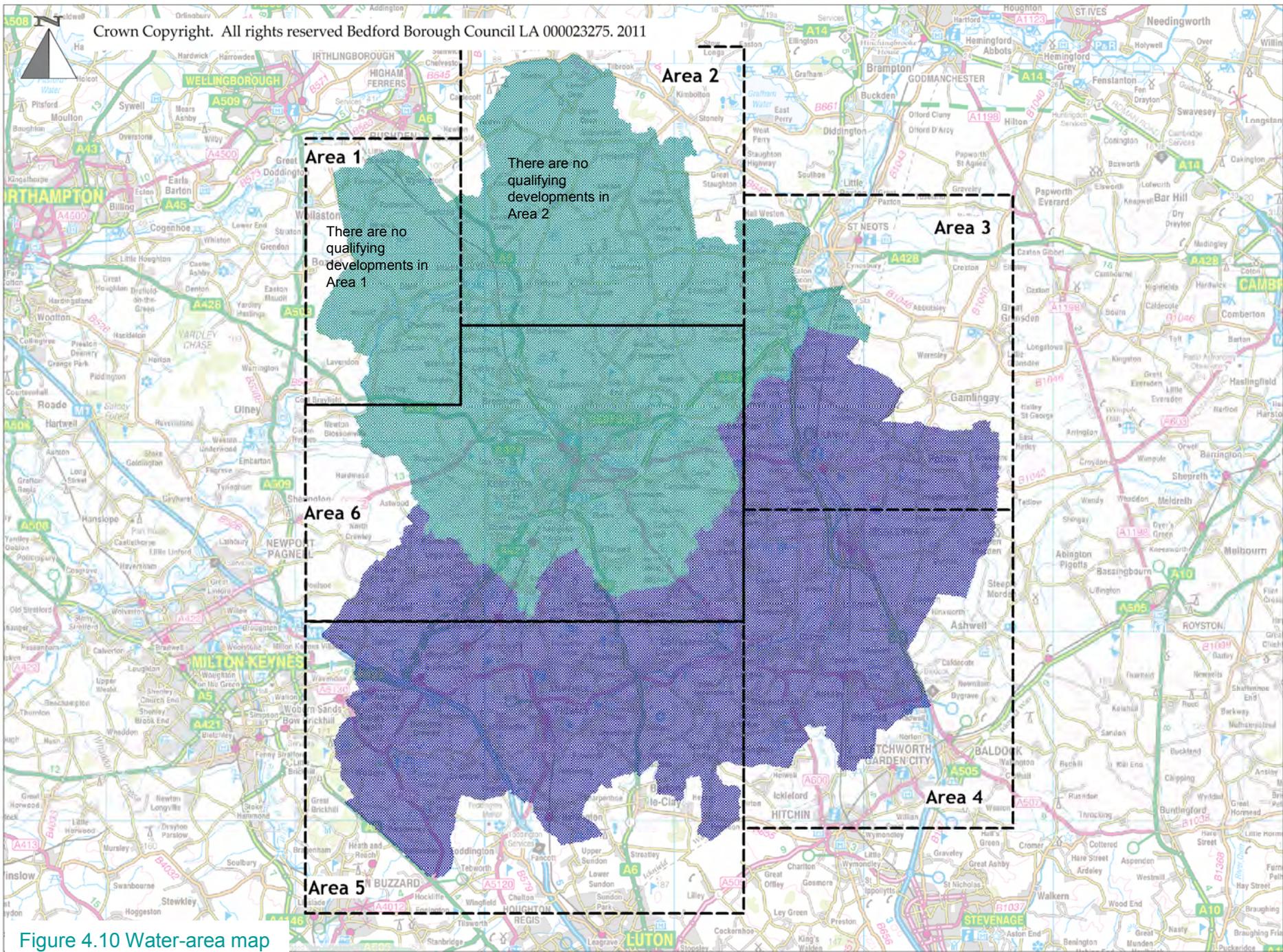


Figure 4.10 Water-area map



Water supply network assessment – Area 3

Site	New RAG assessment (March 2011)	Development would trigger strategic scheme (dependent upon timing)	Development would contribute to strategic scheme(s)	Local off-site works required.	Estimated lead time to completion following agreement of requisition	Comments
Sandy						
E38 Land North of Beamish Close B1, B2 and B8 (5ha) Employment	Amber	N	Y	Y	6 to 12 months	Local offsite reinforcements will be required
Potton						
H075 Land South of Home Lane, Potton Joint with H199 to provide 150 Dwellings and B1 (1Ha) Mixed Use	Amber	N	Y	Y	12 months	This development will require 725m of 125mm reinforcement main in Sandy Road (B1042), and 320m of 180mm reinforcement main along Everton Road and 1.6km of 180mm reinforcement main along Biggleswade Road (B1040)
H199 Land at Biggleswade Road, Potton Joint with H199 to provide 150 Dwellings and B1 (1Ha) Mixed Use	Amber	N	Y	Y	12 months	This development will require 725m of 125mm reinforcement main in Sandy Road (B1042) and 320m of 180mm reinforcement main along Everton Road.
H237 Sutton Mill Road, Potton 58 dwellings Housing	Amber	N	Y	Y	12 months	This development will require 725m of 125mm reinforcement main in Sandy Road (B1042) and 320m of 180mm reinforcement main along Everton Road.
H266 Land rear of Everton Road, Potton 39 dwellings Housing	Amber	N	Y	Y	12 months	This development will require 725m of 125mm reinforcement main in Sandy Road (B1042) and 320m of 180mm reinforcement main along Everton Road.
H356 Land to the South of 'The Paddocks', Potton 46 dwellings Housing	Amber	N	Y	Y	12 months	This development will require 725m of 125mm reinforcement main in Sandy Road (B1042) and 320m of 180mm reinforcement main along Everton Road.

Water supply network assessment – Area 4

Site	New RAG assessment (March 2011)	Development would trigger strategic scheme (dependent upon timing)	Development would contribute to strategic scheme(s)	Local off-site works required.	Estimated lead time to completion following agreement of requisition	Comments
Biggleswade						
H347 Land at Potton Road 330 dwellings Housing	Amber	N	Y	Y	12 to 18 months	Depending upon the timing of the development there should be capacity for the first 50-100 dwellings. There is a new 4.3km 280mm main proposed to be laid from Toplers Hill WR to Biggleswade to supply growth, and this development will need to contribute
E11/E67 Land at Stratton Farm B2 and/or B8 (10ha) Employment	Amber	N	Y	Y	12 to 18 months	Depending upon the timing of the development there should be capacity for the first phases. There is a new 4.3km 280mm main proposed to be laid from Toplers Hill WR to Biggleswade to supply growth, and this development will need to contribute towards this main, and this scheme will need to be completed before the whole of this development could be supplied.
Sheffield						
H055 Land off Stanford Road, Sheffield 133 dwellings Housing	Amber	N	Y	Y	3 to 6 months	This development will require 200m of 180mm reinforcement main will be required along The High Street
Stotfold						
H056 Land South of Malthouse Lane, Stotfold 120 dwellings Housing	Amber	N	Y	Y	6 to 12 months	Depending upon the timing of the development it will require 100m of 90mm reinforcement main to be laid along The Green and it may need 1.0km of 250mm reinforcement main to be laid along Edworth Road.
H159 Land South of Arlesey Road, Stotfold 50 dwellings Housing	Amber	N	Y	Y	6 to 12 months	Depending upon the timing of the development it may require 1.0km of 250mm reinforcement main to be laid along Edworth Road.
H260 Land at Arlesey Road, Stotfold 85 dwellings and small scale B1/commercial Housing	Amber	N	Y	Y	6 to 12 months	Depending upon the timing of the development it may require 1.0km of 250mm reinforcement main to be laid along Edworth Road.
Arlesey						
H293 West and East to High Street, Arlesey 1000 houses with community facilities, retail and relief road Mixed Use	Amber	N	Y	Y	12 to 18 months	Depending upon the timing and the point of access for the development it may require 1.0km of 280mm reinforcement main to be laid along Edworth Road, 600m of 225mm reinforcement main along High Street and 890m of 250mm reinforcement main within fields to the west of Stotfold.
Henlow						
H046 Land at Clifton Road, Henlow 155 dwellings Housing	Amber	N	Y	Y	3 to 6 months	This development will require 1km of 180mm reinforcement main along Clifton Road and the A6001 High Street.
H264 Land at Northfield Farm, Henlow 140 dwellings Housing	Amber	N	Y	Y	3 to 6 months	This development will require 0.8km of 180mm reinforcement main along the A6001 High Street.

Water supply network assessment – Area 5

Site	New RAG assessment (March 2011)	Development would trigger strategic scheme (dependent upon timing)	Development would contribute to strategic scheme(s)	Local off-site works required.	Estimated lead time to completion following agreement of requisition	Comments
Amphill						
H052 Land off Flitwick Road 150 dwellings Housing	Amber	N	Y	Y	6 to 12 months	To supply this development it will be necessary to lay 600m of 180mm reinforcement main along Flitwick Road
Flitwick						
H113 Flitwick Town Centre 86 dwellings as part of mixed use development (inc. employment, retail, parking) Mixed Use	Amber	N	Y	Y	3 to 6 months	Local offsite reinforcements maybe necessary at the time of development
Clophill						
H042 Dwelling and garden land to the rear of 122a & 124 High Street, Clophill 16 dwellings Housing	Amber	N	Y	Y	3 months	To supply this development would require 280m of 125mm main to be laid along The High Street Clophill. This scheme will go ahead once a requisition or firm commitment has been received from the developer, and the anticipated timescale to deliver this scheme is in the order of 3 months.
Brogborough						
E15 Land between A421 and Marston Gate Distribution Park (Storage or Distribution) Employment	Amber	N	Y	Y	6 months	Depending upon the demand there may need to be mains reinforcements required from Birchmoor WTW

Water supply network assessment – Area 6

Site	New RAG assessment (March 2011)	Development would trigger strategic scheme (dependent upon timing)	Development would contribute to strategic scheme(s)	Local off-site works required.	Estimated lead time to completion following agreement of requisition	Comments
Bedford Borough						
91 Land south of Bromham Road, Biddenham Place of worship – seating for 700, plus meeting rooms (size not known)	Green	N	Y	N	No lead time required as Bedford S&W reinforcements do not need to be completed before this development goes ahead.	Some minor rezoning work may be required and this development will need to contribute towards phase 1 of the Bedford south and West reinforcements.
377 St Bedes School, Bromham Road, Bedford Housing – 80 units (poss extra care)	Amber	N	Y	Y	3 months	To supply this development 170m of 225mm reinforcement main will need to be laid along Bromham Road. This scheme will go ahead once a requisition or firm commitment has been received from the developer, and the anticipated timescale to deliver this scheme is in the order of 3 months.
83 Dallas Road, Bedford Housing – 122 units	Amber	N	Y	Y	6 months	The development will need approximately 405m of 180mmOD reinforcement main along Bedford Road from the development to the junction with Hillgrounds Road, and this development will also need to contribute towards
60 Land at Ford End Road, Bedford Housing – 200 units	Amber	N	Y	Y	6 to 12 months	To supply this development it will be necessary to lay 95m of 125mm reinforcement main along Ford End Road and 100m of 225mm reinforcement main along Old Ford End, and this development will also need to contribute towards phase 1 of the Bedford south and West reinforcements.
68 Land rear of Eastcotts Road, Bedford Housing – 50 units	Green	N	Y	N	No lead time required as Bedford S&W reinforcements do not need to be completed before this development goes ahead.	This development will need to contribute towards phase 1 of the Bedford south and West reinforcements.
(possibly also 4 small B1 start up units)	Green	N	Y	N	No lead time required as Bedford S&W reinforcements do not need to be completed before this development goes ahead.	This development will need to contribute towards phase 1 of the Bedford south and West reinforcements.
191 Wixams northern expansion Housing – 1050 units	Amber	Y AMP5 scheme	Y	Y	18 months (based on requiring Bedford south and west reinforcements)	This development will need the Bedford south and West reinforcements to be completed and contributions towards this scheme will also be required.
Employment – 9.5 ha	Amber	Y AMP5 scheme	Y	Y	18 months (based on requiring Bedford south and west reinforcements)	This development will need the Bedford south and West reinforcements to be completed and contributions towards this scheme will also be required.
44 Land at Hall End Road, Wootton Housing – 50	Amber	N	Y	Y	6 to 12 months	This development will require 1.2km of 125mm reinforcement main to be laid along Keely Lane and Woodend Road and some rezoning work also needed.
78 Reservoir site, Manton Lane, Bedford Small units, gen industry (B2 and B8). 45% plot ratio gives 1.5ha.	Green	N	Y	N		The area of this site that can be redeveloped is approximately 1.8ha not 3.3ha. This site will need to be supplied from Manton Lane WB, and depending upon the customer's required peak flow there should be capacity to supply this development from the WB. However, this is on the site of the old Manton Lane WR and it will need to be demolished first and the large
176 Land at Bell Farm, Kempston B1 (a,b and c) and B8 space at plot ratio of 40% = 7.2ha.	Amber	Y AMP5 scheme	Y	Y	18 months (based on requiring Bedford south and west reinforcements)	This development will need the Bedford south and West reinforcements to be completed and contributions towards this scheme will also be required.

Water supply network assessment – Area 6

Site	New RAG assessment (March 2011)	Development would trigger strategic scheme (dependent upon timing)	Development would contribute to strategic scheme(s)	Local off-site works required.	Estimated lead time to completion following agreement of requisition	Comments
Bedford Borough						
150 Land at Medbury Farm, Elstow 31ha B1 business park use	Amber	N	Y	Y	6 to 12 months	Depending upon the timing of this development, it's phasing and the site access for this development it will require up to 650m of 280mm reinforcement main along Old Harrowden Road and 350m of 180mm reinforcement main along Abbey Fields.
67 Land r/o Manton Lane, Bedford Small B1/B2 units. No detail given – say half of the site is developable (based on Louise's landscape work). Using 45% plot ratio this gives approx 3ha.	Green	N	Y	N		This site will need to be supplied from Manton Lane WB, and depending upon the customer's required peak flow there should be capacity to supply this development from the WB.
195 Land at Fields Road, Wootton 10ha. Business Park space (B1 a,b and c and B2) at plot ratio of 40% = 4ha.	Green	N	Y	N		A peak flow of 4 l/sec has been assumed for this development and depending upon the timing of this development as other developments may go ahead use any spare capacity then there should be sufficient capacity to supply
165 Land at Bedford Road, Great Barford 0.4ha Primary Care facility	Amber	N	Y	Y	6 months	This development may require up to 250m of 180mm reinforcement main along Green End Road.
279 Land north of 17-22 Peach's Close, Harrod 10-12 affordable housing units	Amber	N	Y	Y	3 to 6 months	This development may require up to 100m of 180mm reinforcement main along Felmersham Road.
63 Land at Manton Lane Eight plots for travelling showpeople	Green	N	Y	N		This site will need to be supplied from Manton Lane WB, and depending upon the customer's required peak flow there should be capacity to supply
Land West of B350 3.4ha	Amber	Y AMP5 scheme	Y	Y	18 months (based on requiring Bedford south and west reinforcements)	Depending upon the required demand this development could need the Bedford south and West reinforcements to be completed and contributions towards this scheme will also be required. The anticipated timescale to deliver this scheme is in the order of 18 months.
Wixams						
H278 Land South of the Wixams 1000 dwellings as part of mixed use development (inc. employment, leisure, education and neighbourhood) Mixed Use	Amber	Y AMP5 scheme	Y	Y	18 months (based on requiring Bedford south and west reinforcements)	Offsite reinforcements required from Ampthill Res
Cranfield						
H040 Land Rear of Central Garage, High Street, Cranfield 135 dwellings and doctors surgery (doctors surgery has been granted planning)	Amber	N	Y	Y	6 months	To supply this development would require 315m of 355mm main to be laid east of Aspley Guise. This scheme will go ahead once a requisition or firm commitment has been received from the developer, and the anticipated
H105 Land at Cranfield Airfield, Cranfield University, Cranfield 425 dwellings Housing	Amber	N	Y	Y	12 to 18 months	Substantial local reinforcements required for growth in this area. Mains reinforcements required from Birchmoor WTW
Marston Moretaine						
E09 Land at Moreteyne Farm, Marston Moretaine 160 dwellings and B1c (Light Industrial) and B2 (General Industrial) Mixed Use	Amber	N	Y	Y	12 to 18 months	Significant offsite reinforcements maybe required depending on demand requirements

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