

Gatwick Sub Region

Outline Water Cycle Study

Final Report

14 January 2011



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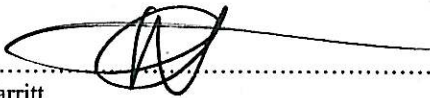
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Executive Summary

Purpose of this Report

This report has been produced for the purpose of providing an initial overview of the water cycle, its constraints to development and requirements to meet European water quality targets in the Gatwick Sub-Region. The study area (presented in Figure 2.1) includes Crawley Borough Council and parts of Mid Sussex District Council, Horsham District Council and Reigate and Banstead Borough Council, referred to as the sub-regional authorities. Although parts of Tandridge District Council and Mole Valley District Council are within the Gatwick Sub-Region area, the bulk of their housing allocation is not within the study area and will subsequently have little influence on the water cycle within Crawley.

The aim of the assessment is to provide strategic level advice on water infrastructure and environmental capacity to inform the Local Development Frameworks, Development Plan Documents and strategic site allocations for the four sub-regional authorities. The sub-regional authorities are exploring four growth options to meet the housing requirement for growth “around Crawley”.

A Water Cycle Study is normally prepared in three stages: the Scoping Stage summarising the available information and identifying any information gaps that may require further study; the Outline Stage identifying the environmental and major infrastructure constraints and identifying any significant barriers to development; and the Detailed Stage investigating potential solutions to infrastructure barriers. This report forms the Outline Stage Study in accordance with the Environment Agency Guidance. The aims and objectives can be outlined as follows:

- Take an integrated approach to management of the water environment;
- Meet EU framework targets on water quality, determining whether environmental resources can cope with providing water and receiving wastewater to/from further development;
- Determine whether the existing water and wastewater services infrastructure have sufficient capacity to support the potential development;
- Determine whether environmental resources can cope with providing water and receiving wastewater to/from further development;
- Ensure sustainable flood risk management over the long term is delivered through policies to protect future development from flooding;
- Provide the evidence base for the Local Development Framework and Development Plan Documents.

The study has involved working with the key stakeholders to establish the key constraints within the water cycle. The Steering Group comprises the four sub-regional authorities, South East Water, Southern Water, Sutton and East Surrey Water, Thames Water and the Environment Agency. Data has been collated from these third party



organisations to inform the potential housing and employment growth numbers and to review environmental and infrastructure capacity. The study is based on data that was made available between May and October 2010 on water infrastructure plans and projected growth scenarios up to 2031. It has been recommended in this study that a Detailed Phase is undertaken and that regular correspondence between the utility providers, the Environment Agency and the Councils takes place to review and update both planning and water infrastructure and environmental data.

Development Plans

This assessment has reviewed the potential impact of growth on the water environment using regional growth targets from the South East Plan Regional Spatial Strategy, which set a target for housing provision across the Gatwick Sub-Region of 36,000 dwellings between 2006 and 2026, distributed as follows:

- Crawley Borough – 7,500 dwellings;
- Horsham District (part) – 9,200 dwellings;
- Mid Sussex District (part) – 16,800 dwellings;
- Reigate & Banstead Borough (part) – 2,500 dwellings.

During the course of this study the regional tier of planning policy framework was revoked by the new Coalition government and has since been re-instated. Notwithstanding this, the indicative housing numbers used for the period to 2026 and 2031 may be subject to change in the future in light of the proposed localism bill. It was confirmed during the study that the regional housing targets should still be used, for the purposes of this study, to assess environmental and infrastructure capacity.

Four growth scenarios have been compiled for the study, in liaison with the sub-regional authorities, to reflect current uncertainty over the location of a strategic neighbourhood development of 2,500 homes in and around Crawley and the capacity of the potential strategic site options in Horsham District. It should be noted that in the Crawley and Horsham context, greater certainty will be provided in later stages of the Councils' Core Strategy Review process as the evidence base is compiled. The strategic sites considered in this study use indicative housing capacities only, based in some cases on the remaining housing requirement to meet the revoked regional targets.

Water Cycle Context

The Gatwick Sub-Region lies within the catchments of the River Arun, River Ouse, River Mole, River Adur and River Medway (Figure 3.1). The Rivers Arun, Ouse and Adur are located in the wider Southern River Basin District, as defined by the Environment Agency in preparing River Basin Management Plans for the Water Framework Directive (see below). The Rivers Mole and Medway are located in the Thames River Basin District.



Water supply is provided by South East Water (to most of Mid Sussex), by Southern Water (Crawley, Horsham and a small area of Mid Sussex) and by Sutton and East Surrey Water (to Reigate and Banstead). The supply areas are presented in Figure 3.3. Public sewerage services are supplied to small areas of Horsham and Mid Sussex and all of Crawley and Reigate and Banstead by Thames Water. Southern Water provides public sewerage services to most of Mid Sussex and the extent of Horsham that falls within the study area. Figure 3.2 presents the indicative wastewater treatment works catchment areas in the study area.

The Water Framework Directive is the leading legislation in Europe for matters relating to the water environment and is set within a River Basin District context. It sets out a requirement to prevent deterioration of current water quality and overall status, and to achieve good ecological status in rivers, estuaries and coastal waters, together with good status of groundwater by at least 2027. Currently the water quality in the study area's rivers is mostly classified as Moderate to Poor Status.

Water Supply and Availability

The study has used the water companies Business Plans and Water Resource Management Plans (WRMP) to review their investment plans over the growth period. The WRMP for South East Water was being investigated at public inquiry during the production of this report. This study is therefore based on their Draft WRMP. The decision on the public inquiry was made at the end of this study, and therefore a review of the published plans should be undertaken in the detailed phase study.

Using the latest available data, it has been identified that the three water supply companies have plans to secure supply based on the regional growth targets, through the planning period. The plans to secure supply are dependant on demand management (customer side metering and water efficiency, leakage reduction etc) as well as resource development schemes. In the case of the Sutton and East Surrey, the report is based on the Final WRMP as amended by Final Determination for the AMP5 period. The funding available for the AMP5 period means that the company's resource development at Reservoir A has to be carried out in two phases. The second phase, together with other proposed supply/demand balance activity in later AMP periods, will be subject to review at PR2014.

An estimation of the increased demand in the study area over the growth period has been undertaken using different water efficiency levels in new and existing homes. The results (Figure 5.1) suggest that the most efficient option whereby all new homes meet the water efficiency level 3/4 from the Code for Sustainable Homes could reduce the demand by approximately 4 Ml/d by the end of the period. The study recommends that water efficiency is embedded in policy in the study area, to support the water companies demand management schemes which are used to support management of supply.

Further information is required to establish whether the physical infrastructure to connect development to the available supply is needed. Development within pre-existing developed sites can generally be connected to the mains network with limited delay. It is advisable that the sub-regional authorities and developers confirm development plans with the water companies as soon as possible to ensure that connections can be made as required, particularly if there is widespread and/or large scale development planned simultaneously.



Water Quality and Wastewater Treatment

The water quality of the rivers in the study area is generally Moderate Status, with Poor Status present on the River Adur. Elevated nutrient levels contribute to the water quality issue in the area, with particular regard to phosphorous that can arise from agricultural sources as well as from sewage discharges. There is potential for growth to increase pressure on meeting the WFD target of Good Status if growth levels exceed existing wastewater discharge consents. Detailed modelling is required to assess the impacts of growth on effluent and on receiving water quality, which lies outside the scope of this study. A high level assessment of quality constraints and future flow capacity has been undertaken.

It has been determined that there is capacity at Horsham WwTW to accommodate the planned growth under all scenarios. Although the River Arun is failing to meet Good Status, it has been advised that within the current flow consent, the quality of effluent will not deteriorate with the proposed growth levels, within the Best Available Technology (BAT) operating at the Horsham works.

Thames Water has advised of a planned upgrade at Crawley WwTW during the AMP5 period to accommodate a population equivalent of 167,000 by 2021. Assuming an occupancy rate of 2.4 and an existing PE of 148,600, this equates to 7,666 homes that could be accommodated at the works. It has been assessed in this study that the potential growth levels from the development scenarios will be approximately 6,924 by 2021 and up to 7,970 by 2026 (Scenarios 1 and 2) or 2031 (Scenario 3a and 3b), exceeding the number of homes that can be accommodated at the works by approximately 300. The additional growth beyond the 167,000 population equivalent in the Crawley catchment is likely to require additional capacity to be provided at Crawley WwTW.

It is advised that the continued discussions take place with Thames Water to monitor the impact of growth at the works, as they have advised of potential constraints post 2021, and because the growth levels assessed in this study are indicative only. Furthermore, investigation into the potential for changes in occupancy rate and in water consumption and the potential to contribute to offsetting the additional growth in development in the Crawley catchment should be considered. There are currently no environmental constraints, however there is the possibility that future standards might be tightened to contribute toward meeting WFD targets.

Goddards Green WwTW will potentially reach the flow capacity during the growth period. An upgrade will be required to provide capacity for new development in excess of 2,600 new houses. The WwTW is currently at BAT and cannot treat waste to higher BOD standards. Environmental constraints may require additional flows to be discharged at an alternative location agreed by the Environment Agency.

Eden Vale WwTW may also require an increase in flow consent at the end of the planning period if the indicative growth levels occur in the area of East Grinstead that is served by this works. Felbridge, Handcross and Horsted Keynes WwTWs are also forecast to potentially exceed their flow capacity during the growth period, based on potential housing numbers and locations. The capacity for process treatment is dependent on the ability of the receiving watercourses to accept increased flows without affecting WFD targets. These works are currently operating at BAT and additional work is required to determine if increased flows and loads can be accommodated.



The flow capacity issues at Crawley, Goddards Green and Felbridge WwTW (and also at Eden Vale, Handcross and Horsted Keynes) present constraints to the indicative levels of growth used in this study. Further detailed modelling of the impact of growth on wastewater flow and on water quality is required to identify potential solutions.

Large scale developments are also likely to require new sewerage infrastructure to convey waste flow to the treatment works. No major constraints are identified, however, there is recognition that local infrastructure on site will be required to connect large sites to the nearest works, which developers will be required to fund.

Flood Risk and Sustainable Drainage

Level 1 Strategic Flood Risk Assessments (SFRAs) have been prepared for all four of the sub-regional authorities. Proposed development sites have been identified in areas of Flood Zone 1, the zone with the lowest probability of flooding, and therefore further assessment in Level 2 SFRAs were not considered necessary. This study has summarised the findings of the Level 1 SFRAs in Section 3.4.3. It has also been identified in this report that possible developments locations at West of Ifield, North East Sector, North Horsham, and North West of Burgess Hill should be aware of watercourses running through the proposed site boundaries and the associated flood risk close to the watercourse channels. The potential for infiltration drainage techniques based on the underlying groundwater vulnerability in the study area has been assessed as low to medium. A review of the Environment Agency’s Catchment Flood Management Plans and flood policies is also included in Table 3.4.

Recommendations

Summary of Outline WCS Recommendations
<p>Recommendation 1: Policy for water efficiency</p> <p>The DPDs should require developers of private homes to design new homes to meet the minimum water use standard in Level 3/4 of the Code for Sustainable Homes (105 l/p/d) or ensure any wider sustainable design policy or policies provided meets this standard for water use.</p> <p>The sub-regional authorities should consider a policy for non-household development making it mandatory for commercial buildings to be assessed by a BREEAM assessor, with the expectation that buildings meet Good standard for water consumption targets for the building type (industrial/commercial/office/retail/education etc).</p>
<p>Recommendation 2: Water efficiency campaign</p> <p>It is recommended that in addition to policies for water efficiency in new buildings, the sub-regional authorities promote awareness in the communities of the need to save water, for example through hosting or co-sponsoring annual events to promote water conservation. The sub-regional authorities may choose to lead by example by employing policies to minimise the unnecessary use of resources in its own buildings, vehicles and in all its activities.</p>
<p>Recommendation 3: Consider policies for SuDS</p> <p>The WCS recommends that the DPDs include policies that promote sustainable drainage techniques (SuDS) that mimic natural drainage, rather than using traditional piped systems in all new developments. Suggested wording is provided in Section 8.2. The preferred hierarchy of managing surface water drainage from any development is through first infiltration measures, secondly attenuation and discharge to watercourses, and if these cannot be met, through discharge to surface water only sewers. As part of suggested policies for SuDS it is suggested that a policy is adopted to ensure redeveloped brownfield sites disconnect any surface water drainage from the foul network. These issues should be assessed during the planning application (see Recommendation 4)</p>



Summary of Outline WCS Recommendations

Recommendation 4: Water sustainability and drainage assessment for all new developments of more than 10 dwellings

It is suggested that the sub-regional authorities each consider a policy which makes it compulsory for all new developments for more than 10 dwellings to submit a Water Sustainability and Drainage Assessment as part of their planning application. This would enable developers to demonstrate:

1. the development will meet the water consumption level 3/4 from the Code for Sustainable Homes for all residential developments
2. non-residential developments should demonstrate that they have been assessed by a BREEAM assessor, with the expectation that buildings meet Good standard for water consumption targets for the building type
3. for all developments SuDS have been incorporated to control surface water run-off
4. for the redevelopment of brownfield sites, any surface water draining to the foul sewer network has been disconnected and is managed through SuDS
5. a Flood Risk Assessment has been completed where required. This should be approved by the Environment Agency and in line with the requirements of Planning Policy Statement 25
6. the developer has contacted the sewerage provider to determine if capacity exists offsite for foul and surface water provision. Where capacity off site is not available, ensure that plans are in place for provision ahead of the development's occupation
7. the developer has contacted the water supply provider to determine if capacity exists offsite for water supply. Where capacity off site is not available, ensure that plans are in place for provision ahead of the development's occupation

Recommendation 5: Undertake Surface Water Management Plans

Potential constraints to development exist in the sewerage network as well as wastewater treatment works flow capacity, especially in Horsham, Burgess Hill and Haywards Heath. Sewerage providers consider SWMPs a valuable tool in alleviating network capacity issues, by addressing surface water management and reducing storm overflows into the combined sewer system.

In line with CFMP recommendations, the Outline WCS recommends that SWMPs are considered for Horsham, Burgess Hill and Haywards Heath to determine where improvements in the drainage can be delivered.

Recommendation 6: Detailed WCS

It is recommended that a Detailed WCS is prepared in order to:

- review the Final WRMP for South East Water and confirm plans can accommodate growth;
- undertake water quality modelling to review impacts of growth on receiving waters and potential solutions for wastewater treatment within the Goddards Green, Eden Vale, Felbridge, Hands Cross and Horsted Keynes WwTW catchments, assessed in this Outline study as reaching flow capacity within the growth period;
- undertake detailed modelling to assess requirements for upgrades at Crawley WwTW;
- review supply and sewerage network capacity and solutions
- prepare a Water Cycle Strategy for provision of infrastructure solutions to potential growth over the planned period; and
- facilitate ongoing communication between Steering Group members

Recommendation 7: Continue liaison with Steering Group

The Outline WCS has identified potential constraints at Horsham and Crawley WwTW. Although the planned housing trajectories can be accommodated at the works, any increase in growth in particular as a result of phasing could potentially erode current headroom in the flow consent. Through monitoring growth rates and increased flows at the works, informed decisions can be made on future investment and planning permissions. The Outline WCS provides a starting point to arrange regular updates between Steering Group members, for example through ongoing SWMPs/WCS update or through agreed meeting dates at suitable intervals.



Contents

1.	Introduction	1
1.1	Background and Aims	1
1.2	The Water Cycle	2
1.3	Structure of the Report	5
2.	Context	7
2.1	The Study Area	7
2.2	Planning Policy	8
2.2.1	National Policy	8
2.2.2	Regional Planning Policy	9
2.2.3	Local Planning Policy	10
2.3	Water Cycle Context	18
2.3.1	Water and Sewerage Infrastructure Planning	18
2.3.2	Legislation and Guidance	19
3.	Update of Baseline Information	21
3.1	Review of Scoping Report	21
3.2	Steering Group	23
3.3	Data Requirements	26
3.3.1	Water and Sewerage Company Data	26
3.3.2	Planning Data	26
3.4	Baseline Update	26
3.4.1	Water Quality Update	27
3.4.2	Water Resources Update	30
3.4.3	Flood Risk and Policy Update	31
4.	Potential Constraints to Development	39
4.1	Environmental Constraints	39
4.1.1	Water Quality	39
4.1.2	Water Resource Availability	40
4.1.3	Flooding	43
4.2	Infrastructure Constraints	45
4.2.1	Wastewater Treatment Flow Consent	45



4.2.2	Wastewater Treatment Quality Consent	48
4.2.3	Sewer Network and Drainage	50
4.2.4	Water Supply	50
5.	Capacity and Opportunities for New Development	59
5.1	Water Supply	59
5.2	Wastewater Treatment Works and Water Quality	61
5.2.1	Private Sewage Treatment	64
5.3	Sustainable Flood Risk Management	64
5.4	Summary of Capacity and Opportunities	68
6.	Climate Change	71
6.1	Background	71
6.2	Climate Change Modelling and UKCP09	71
6.3	Climate Change and the Study Area	71
6.4	Assessment of Environmental Capacity and Water Infrastructure Provision	74
6.5	Implications of Climate Change and Mitigation	74
7.	Development Strategy	77
7.1	Identified Growth Scenarios	77
7.2	New Market Town Development	93
7.3	Indicative Development Strategy	93
8.	Future Recommendations	99
8.1	Include Policies for Water Efficiency Measures	99
8.2	Consider Policies for SuDS	101
8.3	Consider Policy Requirement for Water Sustainability and Drainage Assessment	102
8.4	Undertake Surface Water Management Plans	102
8.5	Undertake a Detailed Water Cycle Study	103
8.6	Continued Liaison with Steering Group	104
Table 2.1	National Planning Policy	8
Table 2.2	Existing and Potential Strategic Sites across the Gatwick sub-region study area	11
Table 2.3	Potential Growth Scenarios Assessed for this Study	15
Table 2.4	Planned Employment Land	16
Table 2.5	Primary Water Related Legislation	19
Table 3.1	Scoping Study Gap Analysis	21
Table 3.2	Summary of Key Actions per Catchment from the River Basin Management Plans	27
Table 3.3	Summary of Flood Risks from each of the Local Authorities SFRA's	31



Table 3.4	Preferred Strategies from the Catchment Flood Management Plans (Environment Agency, 2008)	33
Table 4.1	Environmental Constraints	44
Table 4.2	Assessment of Indicative Flow Headroom ^a at Main Wastewater Treatment Works	45
Table 4.3	Wastewater Treatment Works Quality Consents	48
Table 4.4	Infrastructure Constraints	52
Table 5.1	Water Efficiency Assumptions	59
Table 5.2	Potential for Infiltration SuDS	66
Table 5.3	Examples of SuDS Techniques	67
Table 6.1	Table B.2 of PPS25 of Recommended National Precautionary Sensitivity Ranges	73
Table 7.1	Crawley Borough Council Strategic Sites Constraints Matrix	80
Table 7.2	Horsham District Council Strategic Sites Constraints Matrix	87
Table 7.3	Mid Sussex District Borough Council Strategic Sites Constraints Matrix	89
Table 7.4	Reigate and Banstead Borough Council Strategic Sites Constraints Matrix	92
Figure 1.1	Traditional View of the Water Cycle without Artificial Influence	3
Figure 1.2	Schematic of the Urban Water Cycle Based on Current Practice	4
Figure 2.1	Study Area	7
Figure 2.2a	Strategic Sites across the Study Area	13
Figure 2.2b	Strategic Sites - Crawley	14
Figure 2.3	Planning Context of Water Cycle Studies	17
Figure 3.1	Main Rivers and River Catchments in Study Area	25
Figure 3.2	Indicative Wastewater Treatment Works Catchments	35
Figure 3.3	Water Supply Zones covering the Study Area	36
Figure 3.4	Water Framework Directive Overall River Status	37
Figure 4.1	Constraints on developing Water Resources in Water Resource Zones (based on CAMS Assessment)	53
Figure 4.2a	Flood Zones and FRA Requirements Study Area	54
Figure 4.2b	Flood Zones and FRA Requirements Crawley	55
Figure 4.3	Wastewater Treatment Works Constraints	56
Figure 4.4	Sewerage Commentary	57
Figure 5.1	Impact of Water Efficiency Scenarios on Demand for Water Supply	60
Figure 5.2	Wastewater Treatment Works Assessment of DWF Consent	62
Figure 6.1	Change in Annual Average Daily Temperature for the 2020's under the Medium Emissions Scenario (UKCP09)	72
Figure 6.2	Change in Winter Mean Precipitation for the 2020's under the Medium Emissions Scenario (UKCP09)	72
Figure 6.3	Change in Summer Mean Precipitation for the 2020's under the Medium Emissions Scenario (UKCP09)	73
Figure 7.1	Indicative Development Strategy (Water Related Infrastructure) Scenario 1: Strategic Development at North East Sector	94
Figure 7.2	Indicative Development Strategy (Water Related Infrastructure) Scenario 2: Strategic Development at Crabtree Park	95
Figure 7.3	Indicative Development Strategy (Water Related Infrastructure) Scenario 3: Strategic Development at West of Ifield and North Horsham	96
Figure 7.4	Indicative Development Strategy (Water Related Infrastructure) Scenario 4: Strategic Development at West of Ifield and Southwater	97
Appendix A	Data Log	





Glossary

AMP	Asset Management Plan
BOD	Biological Oxygen Demand
BREEAM	Building Research Establishment Environmental Assessment Method
CAMS	Catchment Abstraction Management Strategy
CLG	Communities and Local Government
CFMP	Catchment Flood Management Plan
CSH	Code for Sustainable Homes
CSO	Combined Sewer Overflow
Defra	Department for Environment, Food and Rural Affairs
DPD	Development Plan Document
Dry Year	A term used in water resource planning for a year where demand for water is more than is usual in a typical 'normal' year
DWF	Dry Weather Flow
EA	Environment Agency
EIA	Environmental Impact Assessment
GIS	Geographical Information System
GQA	General Quality Assessment
Headroom	Spare hydraulic or flow capacity
IUD	Integrated Urban Drainage
LDF	Local Development Framework
l/h/d	Litres per household per day
LPA	Local Planning Authority
MI/d	Megalitres per day
PE	Population Equivalent, unit per capita loading
Peak Period	A term used in water resource representing average daily demand during the hottest/driest point usually at the height of summer
pcc	Per capita consumption
PPS25	Planning Policy Statement 25
PR	Periodic Review (for water companies' investment plans)
RBD	River Basin District
RBMP	River Basin Management Plan
RSS	Regional Spatial Strategy
SAC	Special Area of Conservation



SFRA	Strategic Flood Risk Assessment
SPA	Special Protection Area
SPZ	Source Protection Zone
SES	Sutton and East Surrey Water
SEW	South East Water
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Surface Water Management Plan
SWS	Southern Water Services
TW	Thames Water
WCS	Water Cycle Study
WFD	Water Framework Directive
WRMP	Water Resource Management Plan
WRZ	Water Resource Zone
WwTW	Wastewater Treatment Works
UKCIP	United Kingdom Climate Change Impacts Programme
UKCP	United Kingdom Climate Projections

