

Sewerage Management Planning – The Role of the Catchment Planner

Introduction

With the inception of SRM 5, Sewerage Utility Companies in the United Kingdom have been provided with a document that moves away from a traditional maintenance and rehabilitation planning approach, to an integrated risk based approach to sewerage asset management. The Sewerage Risk Management approach of SRM5 which is driving Severn Trent Water's (ST) AMP5 Sewerage Management Planning (SMP) production is now aligned with key industry standards and directives such as Capital Maintenance Planning Common Framework (CMPCF), A sustainable water industry – to PR09 and beyond (MD219), Making Space for Water (MSfW), Water Framework Directive (CEC 2000), Drain and Sewer Systems Outside Buildings (EN752:2008) and Surface Water Management Plans (SWMP).

The philosophy of the SMP also requires changing skill sets in the industry. A key new role called a "Catchment Planner" will be intrinsic to the SMP process in Severn Trent and will be fundamental in understanding risks and developing interventions to formulate an Asset Management Strategy for the catchment based on a series of time horizons.

This paper will discuss in more specific detail the role, skill sets and objectives of the "Catchment Planner" and discuss how this role is being tested to produce a Sewerage Management Strategy for the West Bridgford area of Nottingham.

What is a "Catchment Planner"?

The overall objective of the Catchment Planner is to liaise with internal and external stakeholders as part of the Sewerage Management Planning process to develop a time based intervention strategy for a given catchment, that understands and balances investment and risk to the serviceability of the sewerage network.

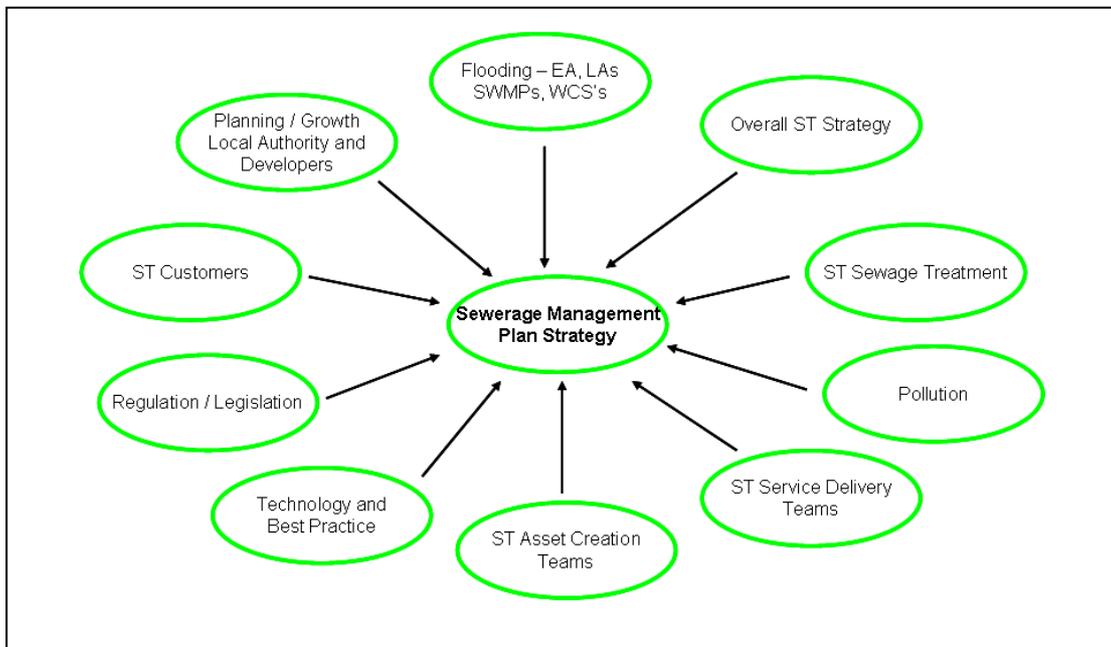


Fig 1 – Sewerage Management Plan Stakeholders and Considerations

As can be seen from Figure 1, the potential list of interested parties and required considerations both within Severn Trent Water and externally can be diverse, each having differing priorities within the catchment, with differing driving forces and objectives.

Within ST, the Catchment Planner needs to work closely with the Asset Creation Teams and Service Delivery Teams to understand catchment risks, then review and advise on suitable capital and operational interventions which fit within the overall strategy for the catchment and manage risk.

The Catchment Planner also needs to build relationships with Local Planning bodies to understand growth impacts in the catchments and influence the planning process where possible. Working with Planners to understand development profiles can inform the timing of any necessary network improvements to prevent deterioration in the serviceability of the sewerage system. The Catchment Planner should also work with the Local Authorities and developers to manage site run-off, promoting SUDs or other techniques to minimise / manage the impact of new developments.

In order to achieve this objective, the Catchment Planner needs to have a range of skills and experience. As part of the SMP, ST have aligned the requirements of the role to the WaPUG Competencies.

Reference	Topic Description	A	K	E	B
Legal Regulation and Finance					
1.1	Legislation				
1.2	Regulatory process				
1.3	Political climate				
1.4	Finance				
Wastewater Planning					
2.1	Customer impact				
2.2	Environment				
2.3	Wastewater systems				
2.4	Rainfall				
2.5	Runoff				
2.6	Hydraulics				
2.7	Structural and service condition				
Modelling					
3.1	Model concepts				
3.2	Data collection				
3.3	Model building				
3.4	Ancillaries				
3.5	Hydraulic verification				
3.6	Water quality modelling				
3.7	Model use				
Design and Construction					
4.1	Design standards and C of P				
4.2	Knowledge of Materials				
4.3	Construction techniques / buildability				
4.4	Risk and exceedance				
4.5	Operability				
4.6	Planning and legal				
4.7	Mechanical and electrical				
Health and Safety					
5.1	Concepts and legislation				
5.2	Risk assessments				
5.3	Confined spaces				
5.4	Traffic				
5.5	COSHH				
General Skills					
6.1	IT Skills				
6.2	Technical software				
6.3	Management skills				
6.4	Numerical Skills				
6.5	Statistics				

As can be seen from the Competency Matrix shown in Figure 2, the "Ability" level requirements are focused around Legislation, Planning, Risk and Management, with an expected level of "Experience" around modelling processes and design and construction.

In particular, the role requires abilities including:

- Communication skills
 - Written
 - Oral
 - Presentations
 - Influencer
- Design Concept Skills
 - Surface Water Management
 - SUDS
 - Exceedance flows
 - Fluvial and Pluvial
 - Surface Water separation
 - Runoff reduction
 - Creep
 - Climate change
- To Keep up to date with the latest technology and innovations
- Understand Local Planning Policy
- Understand EA Planning Policy
- Understanding of STW Planning policy and strategic direction

Fig 2 – Catchment Planner Competencies

Testing the Role – West Bridgford Sewerage Management Strategy

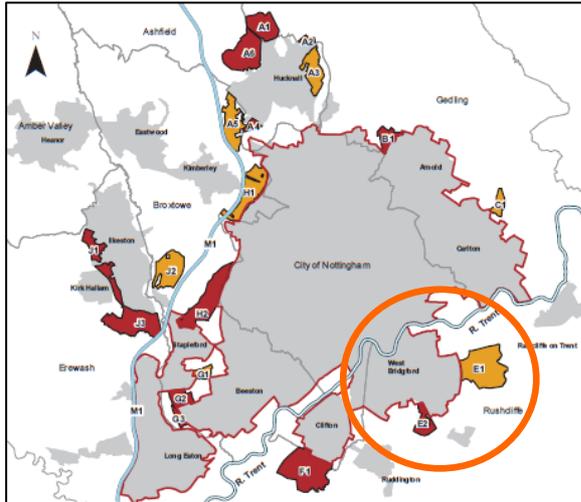


Fig 3 – Greater Nottingham Development Strategy

In order to test the role of Catchment Planner, ST appointed Mouchel to develop a Sewerage Management Strategy for the West Bridgford area of Nottingham in line with the specification of the new Sewerage Management Planning Framework. One of the key reasons for the choice of catchment was the significant growth outlined over the next 15 years, together with a number of major AMP5 projects within the area.

Figure 3 shows the location of approximately 4200 new homes which will drain into the West Bridgford sewerage network.

Following the process outlined in a previous WaPUG Paper (Terry et al 2009), the key “Risks” within the catchment were identified. These were grouped into three key areas:

- Known Flooding – three current reported flooding location
- Other known catchment problems – principally asset condition issues especially around the Eltham Road PS and rising main.
- Impact of Growth – impact of 4200 additional properties draining into the catchment.

Having liaised with the Local Authority and obtained forecast growth information for the proposed developments, hydraulic models were created for three time horizons – the as built “current” model, together with the Known Short Term Model (0-5 yrs horizon) and the Projected Long Term Model (6-25 yrs horizon). All of these models were subject to a standard suite of Scenario Tests to enable the impact and change in risk with time to be reviewed.

As part of the SMP process, numerous “risk zones” were identified of different types which were then combined into a series of “Intervention Zones” and a strategy developed to deal with each over the next 25 years.

The main Intervention Zone identified was for the central area of West Bridgford where the performance of the sewerage system is impacted heavily by both forthcoming projects and the planned growth. Figure 4 shows the baseline flood risk for the West Bridgford catchment, together with comparative analysis demonstrating a worsening of flood risk in the short and long terms.

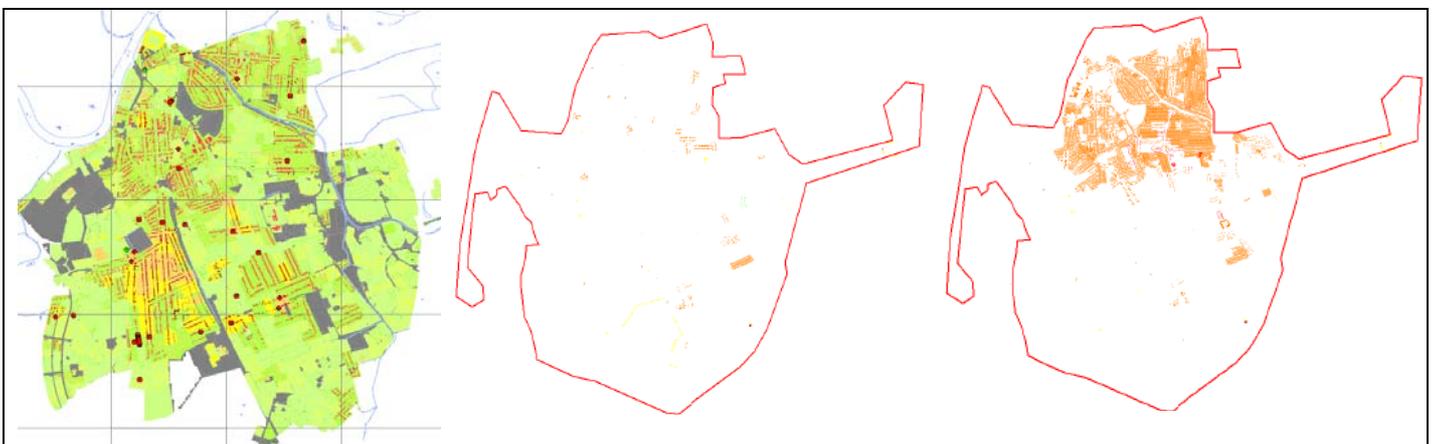


Fig 4 – Baseline Flood Risk and Comparative Analysis to Short Term and Long Term Horizons

Analysis of the results confirm that the main cause of the increase in flood risk is associated with the restricted capacity of the main catchment pumping station at Eltham Road. The station

pumps flows into the Nottingham catchment to the north of the River Trent but has no overflow with excess storm flows being pumped to local storage tanks.

As a Catchment Planner, working with the Asset Delivery Team, it is possible to test potential pump rates for the proposed pumping station upgrade and replacement rising main and to use the comparative analysis tool to determine a pump rate for the Short and Long Terms which maintain the flood risk within the catchment. Figure 5 shows how the flood risk is lowered by the increased pumping rate on the As Built, Short Term and Long Term horizons when compared against the baseline results which use current pump rates.

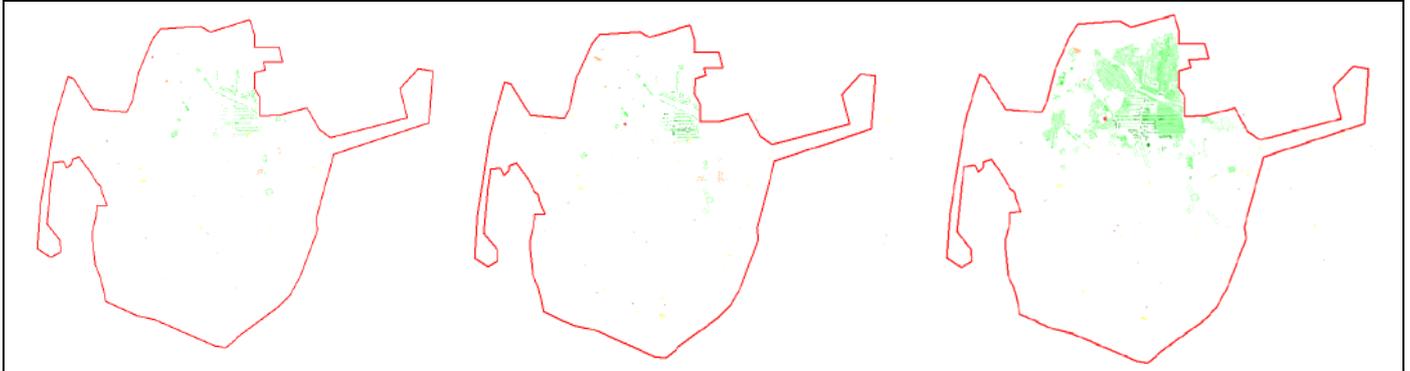


Fig 5 – Comparative Analysis showing impact of Increased Pump Rates

As we are aware of the proposed timing of the developments, we have discussed with the Asset Creation Team the opportunity to construct the pumping station and storage facility in stages to suit the increase in required capacity over time, thus avoiding early spend. Because of the analysis undertaken, these decisions can be taken with a full awareness of the residual risk to serviceability and performance within the catchment.

It has also been possible to model the impact and benefit of other ways of reducing flows including identifying areas for separation and control of impermeable area creep.

Conclusions

The role of the Catchment Planner in delivering ST's AMP5 Sewerage Management Planning Framework will be an interesting, varied and challenging one. By being able to better understand and quantify the risk associated with investment decisions, or decisions not to invest, ST will be able to develop robust, informed Asset Management Strategies for its sewerage networks.

At the moment the role is being tested on a small catchment, but over the course of the next five years it will undoubtedly grow and adapt to changing legislation, governing strategy and policy as the delivery of ST's Sewerage Management Plans progress. The strategies developed within the Sewerage Management Plan process will each be presented to ST's Programme Board.

References

Terry D, et al (2009) *Sewerage Management Plan – What it means to a Water Company*, WaPUG

Author

Steve Hogg, Divisional Director
Mouchel
Canterbury House, Stephenson's Way,
Wyvern Business Park, Derby, DE21 6LY

Tel: 01332 680066
Mobile: 07793 903229
Email – steve.hogg@mouchel.com