Drainage and Wastewater Management Plan

Romsey
Wastewater System Plan

from Southern Water

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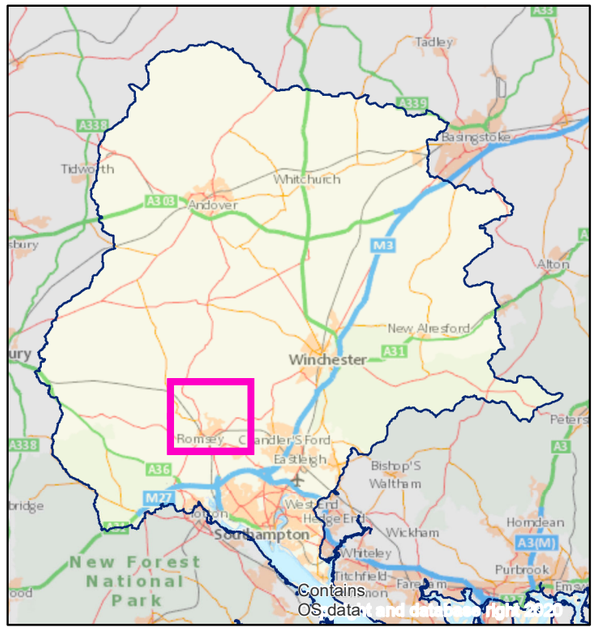
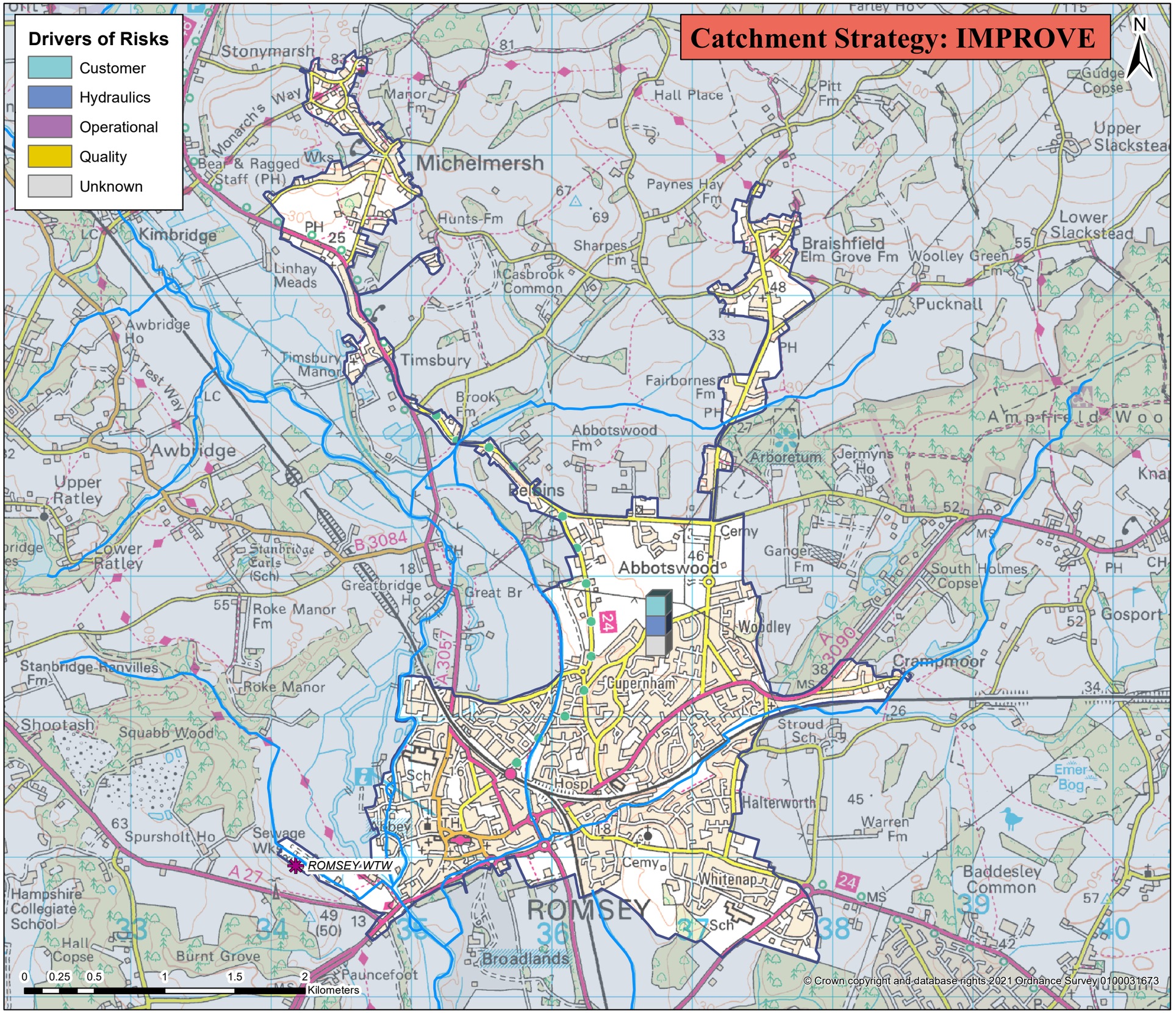
Romsey wastewater system: map and key facts



Population Equivalent (PE)	19,056
Discharge Waterbody	Test - conf Dun to Tadburn Lake
Number of Pumping Stations	21
Number of Overflows	5
Length of Sewer (km)	209.6
Catchment Reference	ROMS

BRAVA Results Table (ROMS)			
	Planning Objective	2020	2050
1	Internal Sewer Flooding Risk	1	
2	Pollution Risk	0	
3	Sewer Collapse Risk	0	
4	Risk of Sewer Flooding in a 1 in 50 year storm	0	0
5	Storm Overflow performance	0	0
6	Risk of WTW Compliance Failure	0	2
7	Risk of flooding due to Hydraulic Overload	1	1
8	Dry Weather Flow Compliance	0	0
9	Good Ecological Status / Potential	0	
10	Surface Water Management	0	
11	Nutrient Neutrality	1	2
12	Groundwater Pollution	0	
13	Bathing Waters	NA	
14	Shellfish Waters	0	



Problem Characterisation
Romsey (ROMS)

This document describes the causes of the risks identified by the Baseline Risk and Vulnerability Assessment (BRAVA). The BRAVA results for this wastewater system are summarised in Table 1. The results indicate that flooding and water quality are the main concerns in this wastewater catchment. We have completed risk assessments for 2050 where we have the data and tools available to do so. For the other planning objectives, we will explore how we can predict future risks for the next cycle of DWMPs. All the risk assessment methods need to be reviewed after the first DWMPs have been produced with a view to improve the methods and data for future planning cycles.

Table 1: Results of the BRAVA for Romsey wastewater system

Planning Objectives		2020	Driver	2050
1	Internal Sewer Flooding Risk	1	Customer	
2	Pollution Risk	0	-	
3	Sewer Collapse Risk	0	-	
4	Sewer Flooding in a 1 in 50-year storm	0	-	0
5	Storm Overflow Performance	0	-	0
6	WTW Water Quality Compliance	0	Quality	2
7	Flooding due to Hydraulic Overload	1	Hydraulic	1
8	WTW Dry Weather Flow Compliance	0	-	0
9	Good Ecological Status / Good Ecological Potential	0	-	
10	Surface Water Management	0	-	
11	Nutrient Neutrality	1	Unknown	2
12	Groundwater Pollution	0	-	
13	Bathing Waters	NA	-	
14	Shellfish Waters	0	-	

Key

BRAVA Risk Band	
NA	Not Applicable*
0	Not Significant
1	Moderately Significant
2	Very Significant

*No issues relevant to planning objective within Wastewater System

Investment Strategy

The risks identified in this wastewater system mean that we have assigned the following investment strategy:

Improve

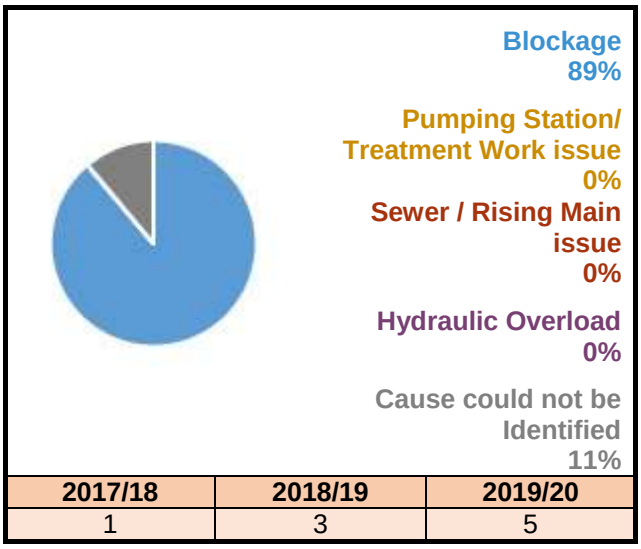
This means that we consider that the current performance of the drainage and wastewater system needs to be improved to reduce the impacts on our customers and/or the environment. We will plan investment to reduce the current risks by actively looking to invest capital funding in the short term to address current performance issues (and consider future risks when implementing improvements).

Planning Objective 1: Internal Sewer Flooding Risk

The number of internal sewer flooding incidents reported during the three years considered by the risk assessment are shown in Figure 1. The total number of connections in this wastewater system means there have been between 1.68 and 3.35 incidents per 10,000 connections per year (a threshold set by Ofwat) so the risk is in the 'moderately significant' band.

The primary driver for internal sewer flooding in this wastewater system is 'Customer'. Blockages caused 89% of all incidents recorded in this wastewater system. Blockages are often caused by fats, oils, grease, nappies, wet wipes and sanitary products within the system. These items are non-flushable and should not be disposed of into wastewater systems.

Figure 1: Number of internal flooding incidents per annum and causes



2017/18	2018/19	2019/20
1	3	5

Planning Objective 2: Pollution Risk

There has been less than one pollution incident reported on average during the three year period considered by the risk assessment, so the risk is in the 'not significant' band. The exception is if there were two incidents in the most recent year.

Planning Objective 3: Sewer Collapse Risk

The number of sewer collapses reported during the three years considered by the risk assessment are shown in Table 2. The length of sewer in this wastewater system means there have been less than 5.72 incidents per 1,000km per year (a threshold set by Ofwat) so the risk is in the 'not significant' band.

Table 2: Sewer collapses and rising main bursts

Sewer Collapse	**2017/18**	0
	2018/19	0
	2019/20	0
Rising Main Bursts	**2017/18**	0
	2018/19	0
	2019/20	1

Planning Objective 4: Sewer Flooding in a 1 in 50 Year Storm

The risk of flooding in a 1 in 50 year storm is not significant in 2020 or 2050. This is because our computer model of the sewer network indicate for 2020 that approximately 100 - 200 properties within this wastewater system are in areas that could flood by water escaping from sewers.

Our wastewater networks are generally designed with capacity for up to a 1 in 30 year storm, hence flooding is expected to occur during more severe storms such as a 1 in 50 year event. Flooding will occur due to insufficient capacity of the drainage system either on the surface before it enters the drainage system, and/or from manholes, in people's homes or at a low point elsewhere in the system.

Planning Objective 5: Storm Overflow Performance

The storm overflow performance risk has been assessed as not significant in 2020 and 2050.

Planning Objective 6: Wastewater Treatment Works Water Quality Compliance

The risk of non-compliance with our wastewater quality permit has been assessed as not significant for 2020 but is predicted to increase to very significant by 2050. This is because the wastewater treatment works has no record of compliance failure during the last three years (2018-2020). However it was assessed to not have adequate capacity to cope with future growth in the wastewater system.

Planning Objective 7: Flooding due to Hydraulic Overload

This is an assessment of the risk of flooding from sewers during a 1 in 30 year storm, and more frequent rainfall, to understand where flooding could occur. The risk of sewer flooding due to hydraulic overload is moderately significant in 2020 and 2050. The annualised number of properties in areas at risk of flooding is shown in Table 3.

Table 3: Annualised number of properties at risk per 10,000 connections.

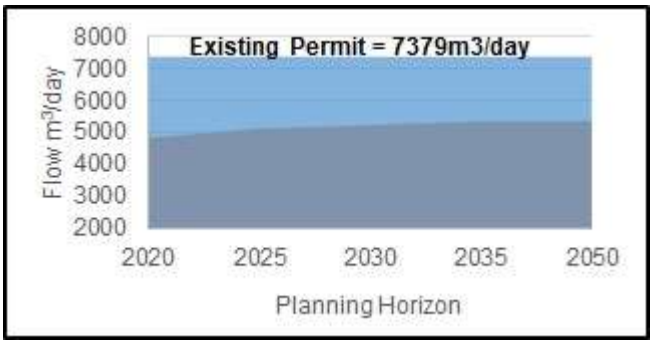
Rainfall Return Period (yr)	Number of Properties at Risk		Annualised per 10,000 connections	
	2020	2050	2020	2050
1 in 1	4	16	3	10
1 in 2	4	17	2	7
1 in 5	19	64	3	12
1 in 10	63	99	6	9
1 in 20	94	187	5	9
1 in 30	108	299	4	10
Total Annualised			**22**	**57**

This indicates that the capacity of the wastewater network can be exceeded during 1 in 30 year storms (or more frequent events). Future growth, creep and/or climate change are not anticapted to significantly increase the risk by 2050.

Planning Objective 8: Wastewater Treatment Works Dry Weather Flow Compliance

The risk of Wastewater Treatment Works Dry Weather Flow (DWF) Compliance is not significant for both 2020 and 2050. This is because the average annual DWF for 2017, 2018 and 2019 has been below 80% of the current permit. The predicted DWF in 2050 is also expected to remain below 80% of the current permit, shown in Figure 2.

Figure 3: Recorded and predicted dry weather flow with existing permit



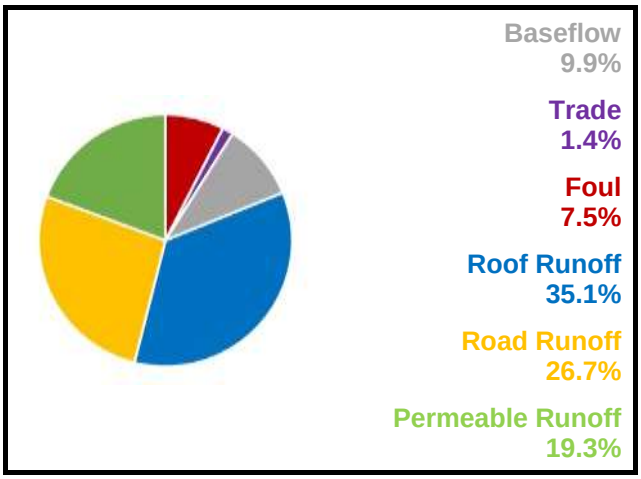
Planning Objective 9: Good Ecological Status / Good Ecological Potential

This wastewater system is not hydraulically linked to a waterbody where wastewater operations are contributing to not achieving GES/GEP, therefore the risk is not significant.

Planning Objective 10: Surface Water Management

Figure 3 illustrates the sources of water flowing in the wastewater system during a 1 in 20 year storm. It shows that surface water runoff from roofs, road and permeable surfaces constitutes more than 81.1% of the flow in the sewers. The total contribution of foul water from homes is 7.5% with business contributing 1.4%. The baseflow is infiltration from water in the ground and makes up 9.9% of the flow in the system.

Figure 3: Sources of water flowing in sewers during a 1 in 20 year storm



Planning Objective 11: Nutrient Neutrality

The risk to internationally designated habitat sites from this wastewater system is moderately significant in 2020 but rises to very significant in 2050. This is because Natural England have advised that there is a risk to condition for the habitat sites that are hydraulically linked to our wastewater system, listed in Table 4.

Table 4: Habitat Sites hydraulically linked to wastewater system

Habitat Sites	
Solent Maritime	Nitrate permit review required
Solent & Southampton Water	No Threat/Remedy Identified or Anticipated
Solent and Dorset Coast	Nitrate permit review required

Our growth forecast suggest that more than 2,000 new homes could occur in this wastewater system by 2050 which means the risk to habitat sites increases to very significant by 2050.

Planning Objective 12: Groundwater Pollution

The risk of Groundwater Pollution is not significant. Although our wastewater network crosses over Source Protection Zones (SPZ) used for water supply, there is no evidence to suggest our network is leaking into these SPZs.

Planning Objective 13: Bathing Waters

This wastewater system does not discharge into a designated bathing water.

Planning Objective 14: Shellfish Waters

The discharges from this wastewater system can affect the designated shellfish waters shown in Table 5. The risk of not achieving the faecal standards for shellfish in these designated waters from this wastewater system is not significant. This is because any microbes or bacteria from the wastewater will either die or their impact will be dissipated before they reach the shellfish water where the discharges are over 5 km away.

Table 5: Shellfish Waters linked to wastewater system

Shellfish Waters
Southampton Water Sw

Generic Options Assessment for: Romsey (ROMS)

Planning Objectives		2020	Driver	2050
PO1	Internal Flooding	1	Customer	-
PO2	Pollution Risk	0	-	-
PO3	Sewer Collapse	0	-	-
PO4	Risk of Sewer Flooding in 1 in 50 yr	0	-	0
PO5	Storm Overflow Performance	0	-	0
PO6	Risk of WTW Compliance Failure	0	Quality	2
PO7	Annualised Flood Risk/Hydraulic Overload	1	Hydraulic	1
PO8	DWF Compliance	0	-	0
PO9	Achieve Good Ecological Status	0	-	-
PO10	Improve Surface Water Management	0	-	-
PO11	Secure Nutrient Neutrality	1	Unknown	2
PO12	Reduce Groundwater Pollution	0	-	-
PO13	Improve Bathing Water Quality	NA	-	-
PO14	Improve Shellfish Water Quality	0	-	-

Type of Measures	Generic Option Categories	Icon	Take Forward?	Reasons	Examples of Generic Options
Source (Demand) Measures (to reduce likelihood)	Control / Reduce surface water run-off		Y	-	Natural Flood Management; rural land management and catchment management; SuDS including blue and green infrastructure; storm management
	Reduce groundwater levels		N	Reducing groundwater levels would reduce the risks from infiltration into the network. However, in practice, reducing groundwater levels will be detrimental to the environment, ground conditions and is prohibitively too costly to implement. For these reasons, this generic option has been discounted.	Reduce leakage from water supply pipes; pump away schemes to locally lower groundwater near sewer network
	Improve **quality** of wastewater		Y	-	Domestic and business customer education; incentives and behaviour change (reduce Fats, Oils & Grease, wet wipes etc.); monitoring trade waste at source; on-site black water and/or greywater pre-treatment
	Reduce the **quantity** / demand		N	None of the significant risks are caused by too much foul wastewater entering our systems from homes and businesses.	Water efficient appliances; water efficient measures; blackwater and/or greywater re-use; treatment at source
Pathway (Supply) Measures (to reduce likelihood)	Network Improvements		Y	-	Asset optimisation; additional network capacity; storage; separate flows; structural repairs; re-line sewer pipe and manholes; smart networks.
	Improve Treatment Quality		Y	-	Increase treatment capacity; rationalisation of treatment works (centralisation / de-centralisation); install tertiary plant; UV plant or disinfection facilities; innovation; improve Technical Achievable Limits; new WTWs
	Wastewater Transfer to treatment elsewhere		N	The causes of risk are not due to where our systems discharge to the environment or our ability to increase the capacity to connect more homes. Transferring wastewater for treatment elsewhere will not reduce any of the significant risks in this catchment.	Transfer flow to other network or treatment sites; transport sewage by tanker to other sites
Receptor Measures (to reduce consequences)	Mitigate impacts on Air Quality		N/A	Not included in first round of DWMPs	Carbon offsetting; noise suppression /filtering; odour control and treatments
	Improve Land and Soils		N/A	Not included in first round of DWMPs	Sludge soil enhancement
	Mitigate impacts on receiving waters		Y	-	River enhancement, aeration
	Reduce impact on properties		Y	-	Property flood resilience; non-return valves; flood guards / doors; air brick covers
Other	Study / Investigation		Y	-	Additional data required; hydraulic model development; WQ monitoring and modelling

August 2021
Version 1

Romsey Wastewater System - Outline Options Appraisal

Generic Option	Location of Risk	Planning Objective and Description of Risk	Option Reference	Description	Further Description	Unconstrained Option?	Constrained Option?	Feasible Option?	Net Benefits	Estimated Cost	Preferred Option	Best value / Least cost or Reasons for Rejection
Control/ Reduce surface water entering the sewers	Catchment Wide	PO1, PO7 - Hydraulic	ROMS.SC01.1	Natural Flood Management	Study / Investigation: Identify suitable location/s for flood alleviation schemes in the Romsey catchment (update hydraulic model) Flood alleviation schemes are being built around Romsey.	Yes	Yes	Yes	Moderate Positive ++	£TBC - With Partners	No	Best Value
Control/ Reduce surface water entering the sewers	New Developments	PO1, PO7 - Hydraulic	ROMS.SC01.2	SuDS	Study / Investigation: Identify with partners and developers suitable location/s to construct SuDS within new developments in the Romsey catchment, for example, on the Ashfield Estate.	Yes	Yes	Yes	Moderate Positive ++	£TBC - With Partners	No	Best Value
Control/ Reduce surface water entering the sewers	Catchment Wide	PO1, PO7 - Hydraulic	ROMS.SC01.3	Rain Water Harvesting	Study / Investigation: Identify suitable location/s for surface water separation in the Romsey catchment to aid potable water supply issue concerns in the catchment/region (update hydraulic model) Utilising the excess levels of surface water for water supply.	Yes	Yes	Yes	Moderate Positive ++	£TBC - With Partners	No	Best Value
Control / Reduce groundwater infiltration												
Improve quality of wastewater entering sewers (inc reducing FOG, RAG, pre-treatment, trade waste)	Romsey	PO1- Internal Flooding	ROMS.SC03.1	Customer Education Programme	Enahnced Customer Education Programme to prevent blockages Linking with the 'FOG' Team.	Yes	Yes	Yes	Minor Positive +	£115K	Yes	Best Value
Control / Reduce the quantity / flow of wastewater entering sewer system												
Network Improvements (eg increase capacity, storage, conveyance)	Romsey	PO1- Internal Flooding	ROMS.PW01.1	Jetting Programme	Enhanced Maintenance: Review and enhance jetting programme of the pipe network in this location to maximise the capacity of the network for rainfall.	Yes	Yes	Yes	Minor Positive +	£90K	Yes	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	Catchment Wide	PO1 and PO7 - Hydraulic Flooding	ROMS.PW01.2	Pipe Rehabilitation Programme	Study / Investigation: Identify suitable location/s for sewer relining to prevent groundwater infiltration in the Romsey catchment (update hydraulic model).	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	No	Best Value
Network Improvements (eg increase capacity, storage, conveyance)	SouthWest of Catchment	PO1 and PO7 - Hydraulic Flooding	ROMS.PW01.3	Additional Conveyance Capacity - Rising main upgrades	Enhanced maintenance: Review operation and maintenance of Rising Mains close to the River Test in the southwest of the catchment - potential for high scale pollution incidents.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	No	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	ROMSEY WTW	PO6 (2050)- WTW compliance	ROMS.PW02.1	Increase Capacity	Diameter of settlement tanks required- PST at 4.	Yes	Yes	Yes	Minor Positive +	£2,010K	Yes	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	ROMSEY WTW	PO11 - Nutrient Neutrality	ROMS.PW02.2	Install UV removal tertiary plant	Installlation of UV removal tertiary treatment at Romsey WTW.	Yes	Yes	Yes	Minor Positive +	£TBC - With Partners	Yes	Best Value
Improve treatment (capacity and quality at existing works or develop new WTWs)	ROMSEY WTW	PO6 (2050)- WTW compliance	ROMS.PW02.3	Optimisation of treatment process	Develop scheme to upsize mains and change the outfall for the works.	No						Risk and uncertainty - future resilience
Wastewater Transfer												
Mitigate impacts on Air Quality (e.g. Carbon neutrality, noise, odour)												Not included in the first round of DWMPs
Improve Land and Soils												Not included in the first round of DWMPs
Mitigate impacts on Water Quality												
Reduce consequences Properties (e.g. Property Flood Resilience)												
Study/ investigation to gather more data	Rudd Lane	PO1- Internal Flooding	ROMS.OT01.1	Investigation into causes	Further investigation to identify the cause of the internal flooding incident.	No						Cost Effective
Study/ investigation to gather more data	Solent Maritime Solent & Southampton Water Solent and Dorset Coast	PO11 - Nutrient Neutrality	ROMS.OT01.2	Nutrient Budget	Study / Investigation: Develop a nutrient budget and investigate the risks and sources impacting these named Habitat sites.	Yes	Yes	Yes	Minor Positive +	£75K	Yes	Best Value
Study/ investigation to gather more data	Catchment Wide? Overflow Locations	PO1 - Internal Flooding PO7- Hydraulic Overload	ROMS.OT01.3	Improve Hydraulic Model	Study / Investigation: Update and re-verify the Romsey Hydraulic Model to improve model confidence.	Yes	Yes	Yes	Minor Positive +	£300K	Yes	Best Value

DWMP Investment Needs

1. The options listed in the DWMP Investment Needs below are the preferred options in our DWMP. They will need further refinement as we implement the DWMP to confirm the exact location and scope of action needed, and the cost.

2. The costs are indicative costs for planning purposes only. The basis for the cost estimates, including assumptions and uncertainties, are explained in our DWMP Investment Plans.

3. The table of Investment Need provides an indicative cost so we know what level of funding is needed to reduce the risks. It is not a commitment to fund or deliver any option.

4. The Indicative Timescale is when the investment is needed. Some options may take several investment periods to achieve the desired outcomes.

5. Potential Partners have been identified in the table of Investment Needs. This is to indicate where there may be opportunities for us to work with these partners when developing and delivering these options. It is not a commitment by any of the partners to work with us.

6. These options will inform our future business plans as part of the Ofwat periodic review process to secure the finance to implement these options.

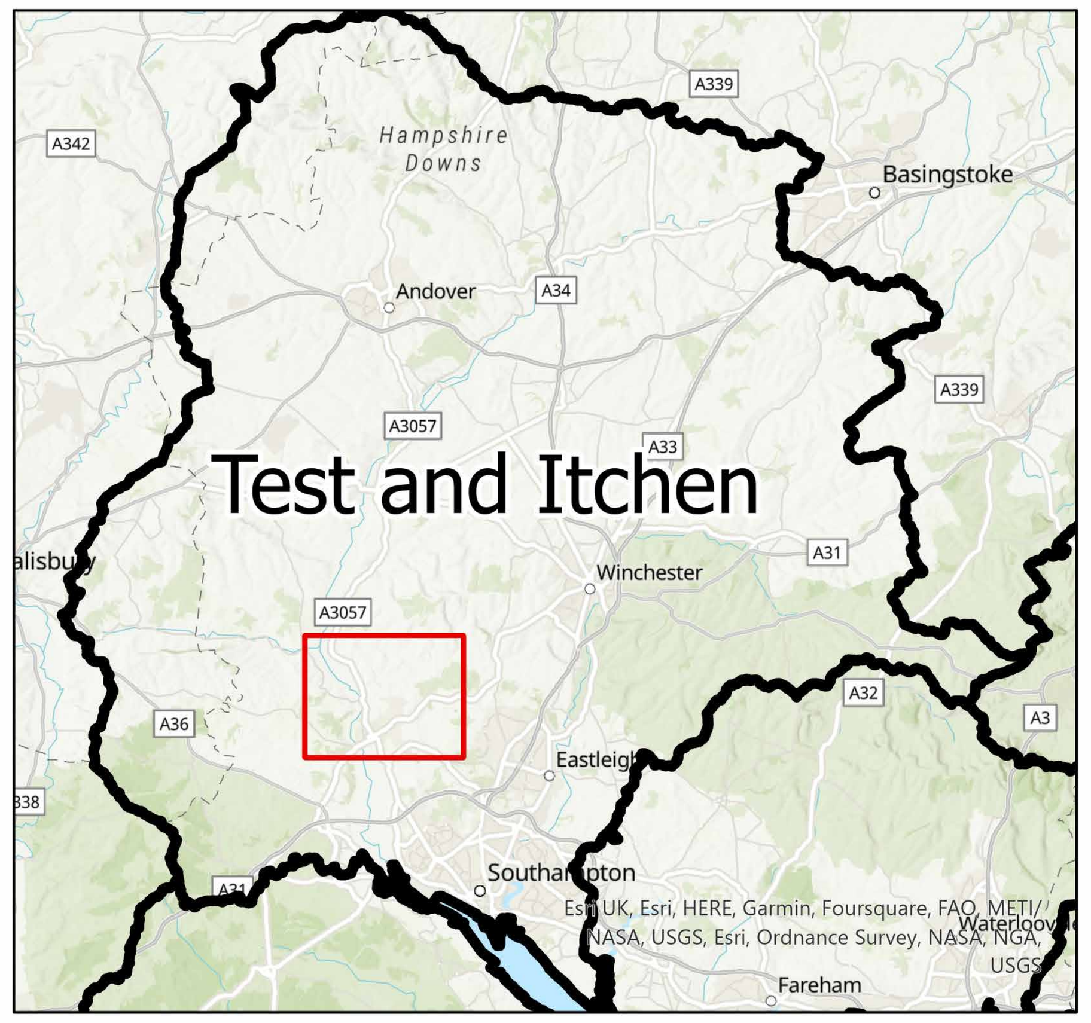
7. The options listed are prioritised by the method stated in the Programme Appraisal Technical Summary.

Date : May 2023
Version : 1.0

Reference	River Basin (L2)	Wastewater System (L3)	Location	Option	Indicative Cost	Indicative Timescales	Potential Partners	Applicable Planning Objectives
Test and Itchen								
Romsey								
ROMS.SC03.1	Test and Itchen	Romsey	Central Romsey (Abbey Water, Tadburn Road, Chambers Avenue	Customer Education Programme: Targeted campaign to reduce the amount of FOG (fats, oils and grease) and unflushables discharged into the sewer network	£115K	AMP8 onwards	Hampshire County Council Test Valley Borough Council	PO1
ROMS.PW01.1	Test and Itchen	Romsey	Hotspot 1 - Central Romsey (Abbey Water, Tadburn Road, Chambers Avenue	Enhanced Sewer Maintenance: Increase targeted sewer jetting to reduce the number of blockages in the network	£90K	AMP8 onwards	-	PO1
ROMS.PW02.1	Test and Itchen	Romsey	Romsey WTW	Increase treatment capacity to allow for planned new development	£2,010K	AMP9	-	PO6
ROMS.OT01.3	Test and Itchen	Romsey	System Wide	Improve the Hydraulic Model: Surveys and reverification of model to improve confidence and accuracy	£300K	AMP8	-	PO1 PO7
ROMS.WINEP01.1	Test and Itchen	Romsey	ROMSEY SSO	Reduce the number of storm discharges from ROMSEY SSO by a combination of SuDS and storage options	£2,860K	AMP11	-	PO4 PO5 PO7
ROMS.WINEP01.2	Test and Itchen	Romsey	MEMORIAL PARK ROMSEY CEO	New or improved screen to reduce aesthetics impacts from storm discharges at MEMORIAL PARK ROMSEY CEO	£130K	AMP11	-	PO5
ROMS.WINEP01.3	Test and Itchen	Romsey	THE HUNDRED ROMSEY CSO	New or improved screen to reduce aesthetics impacts from storm discharges at THE HUNDRED ROMSEY CSO	£130K	AMP12	-	PO5
ROMS.WINEP01.4	Test and Itchen	Romsey	EIGHT ACRES ROMSEY CSO	Reduce the number of storm discharges from EIGHT ACRES ROMSEY CSO by a combination of SuDS and storage options	£1,725K	AMP12	-	PO4 PO5 PO7
ROMS.WINEP.PO2.1	Test and Itchen	Romsey	Romsey WTW	Expansion of existing biological treatment and conversion to denitrification to achieve 10mg/l Total N permit. (WINEP OAR 08SO104007)	£5,990K	AMP8	-	PO9 PO11
ROMS.WINEP.PO2.2	Test and Itchen	Romsey	Romsey WTW	Optimise existing process (WINEP OAR 08SO102639)	£120K	AMP8	-	PO9

Drainage and Wastewater Management Plan: Location of Potential Options ROMSEY Wastewater system in Test and Itchen River Basin Catchment

(i) This map should be read in conjunction with the list of Investment Needs for this wastewater system
(ii) The areas shown on this map are the potential locations for the options. The location of the risk may be elsewhere in the system.
(iii) Labels for each location are the option references in the list of Investment Needs
(iv) Drainage Area Plan (DAP) options on flooding and growth are not shown.



- Customer Education
- Pipe Rehabilitation
- Asset Resilience
- Wastewater Treatment
- WINEP Nutient Neutrality
- WINEP Storm Overflows