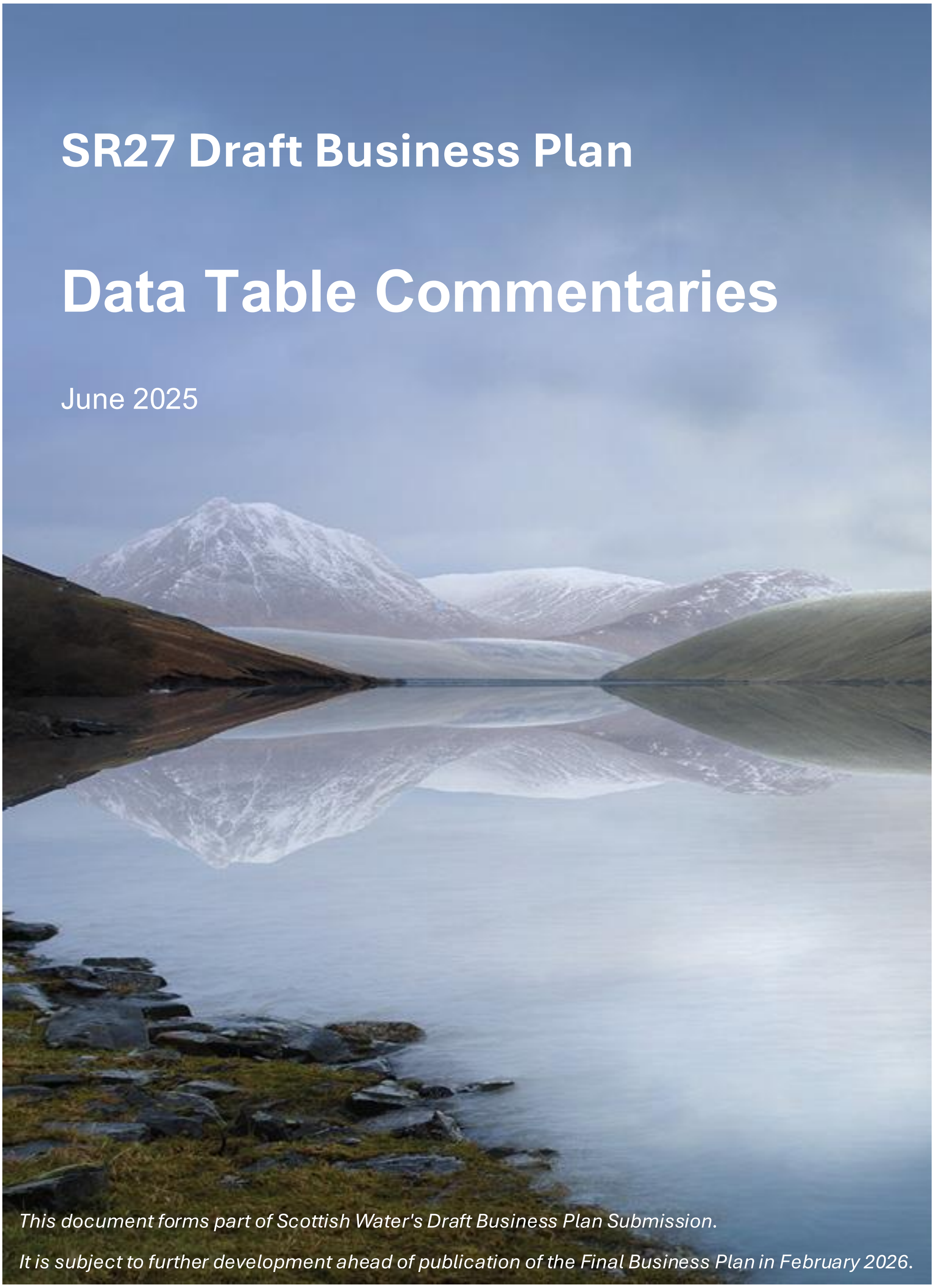

SR27 Draft Business Plan

Data Table Commentaries

June 2025

This document forms part of Scottish Water's Draft Business Plan Submission.

It is subject to further development ahead of publication of the Final Business Plan in February 2026.

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Contents

Table 1: Outcomes Commentary

Contents

1 Overview of this document

1.1 Document purpose

The purpose of this Commentary is Table 1 outcomes including:

1. The lines included and excluded in the outcome projections
2. The definitions
3. The mapping to the National Performance Framework
4. The mapping to the Scottish Government's Water Sector Principles.
5. The projections and basis of the projections
6. The confidence grades
7. The suitability for target outcomes
8. Comparisons with England & Wales (where available)
9. Additional areas for the Final Business Plan
10. Additional information

1.2 How to navigate this Commentary

Table 1: Document Navigation

Section	Detail
Executive Summary	A table of the percentage change over SRC27
Background	Table 1 structure and exclusions
Customer Excellence	Lines 1 to 5
Water Continuity	Lines 7 to 16
Water Quality	Lines 17 to 23
Wastewater flows	Lines 24 to 27
Water Environment	Lines 28 to 32
Net Carbon Emissions & Biodiversity	Lines 34-41

2 Executive Summary

Table 1 presents Scottish Water's outcomes and associated level of service for customers, the environment, and other stakeholders. For each outcome, the forecast level of service is made annually for the SRC27 period and then in the final year for each of the three subsequent periods: SRC33, SRC39, and SRC45. For alternative Scenarios B and C, a forecast level of service in Year 6 of SRC27 is made.

This report provides Commentary on each line within Table 1. The table below summarises the percentage change to 2032/33 from the base (2026/27 unless stated) with confidence grade, key points of note and positive change reflecting improvement.

Ref	Short title	Base	2032/33	Rounded %change	Grade	Notes
1.01	dCEM	81.99	83.04	6%	B3	Change to lost points
1.02	nhCEM	88.78	89.43	6%	B3	Change to lost points
1.03	R-MeX	9.0	9.0	n/a	C3	Survey relative position
1.04	hCEM	87.78	88.49	6%	B3	Change to lost points
1.05	UKCSI	77.9	77.9	n/a	C3	Survey relative position
1.06	Communities	0.0	0.0	-	-	Not available
1.07	Total leakage	455.9	9.90%	10%	B3	3yr avg change from base of 2024/25
1.08	Zonal leakage in deficit zones	233.0	12.90%	13%	C3	3yr avg change from base of 2024/25
1.09	Business demand	371.5	16.20%	16%	D3	3yr avg change from base of 2024/25
1.10	Per capita consumption (PCC)	177.3	174.3	2%	C4	
1.11	Low pressure	30	26	13%	B3	
1.12	Unplanned interruptions	6750	6750	0%	B3	
1.13	Minutes lost	15.0	15.0	0%	D3	
1.14	Repeat ITS	240	200	17%	C4	
1.15	Worst historic drought	2,940,760	2,328,000	21%	D4	Very provisional
1.16	Peak demand	654,860	346,000	47%	D5	Very provisional
1.17	Taste & odour	0.51	0.53	-4%	C3	Marginal decline
1.18	Discoloration	2.11	2.08	2%	C3	
1.19	Lead SW networks	45,550	27,550	39%	C3	
1.20	Lead customer pipes	98.01	98.15	7%	D4	
1.21	Drinking water compliance	99.930%	99.950%	29%	B3	% change to points lost
1.22	WRAP	7,975	6,465	19%	C4	Base of 2024/25
1.23	DWQR reported incidents	30	25	16%	C4	
1.24	Annual internal sewer flooding	1.57	1.48	6%	C5	
1.25	Internal sewer flooding register	1.51	1.51	0%	C4	
1.26	Annual external sewer flooding	10.50	11.24	-7%	C5	Decline, very high uncertainty
1.27	External sewer flooding register	11.35	11.88	-5%	C5	Decline, very high uncertainty

Ref	Short title	Base	2032/33	Rounded %change	Grade	Notes
1.28	WwTW discharge compliance	96.37%	96.37%	0%	B3	% change to points lost
1.29	Serious pollution (EPI Cat 1/2)	8	5	38%	B3	
1.30	Total pollution (all categories)	34.8	34.8	0%	B3	
1.31	Sludge compliance	0.0	0.0	0%	B2	
1.32	Discharges (UIDs)	873	748	14%	C4	
1.33	River water quality	0.0	0.0	-	-	Not available
1.34	Net Zero Emissions	259,257	84,994	67%	C3	2040 target outcome
1.35	Operational emissions (W)	62,882	2,314	96%	B3	
1.36	Operational emissions (WW)	102,219	35,717	65%	B3	
1.37	Baseline emissions	35.74%	8.23%	77%	B3	
1.38	Operational emissions (net)	156,908	14,461	91%	B3	
1.39	Embodied carbon	102,349	70,533	31%	C3	
1.40	Carbon capture/sequestration	- 8,193	- 23,569	-188%	C3	
1.41	Biodiversity land-use	0.0	4,500	n/a	DX	
1.42	Biodiversity outcomes	0.0	0.0	-	-	Not available
1.43	Resource recovery	0.0	0.0	-	-	Not available
1.44	Asset health	0.0	0.0	-	-	In development

Table 2: Outcomes percentage change from the base

Note: The base (2026/27 unless stated) and positive change reflecting improvement.

3 Background

3.1 Report content

This report complements the Technical Appendix for performance monitoring. It is structured to cover the groups of lines in Table 1 relating to:

- Customer Excellences
- Cater Continuity
- Water Quality
- Wastewater flows
- Water Environment
- Carbon emissions and biodiversity

It provides additional details of each line with Table 1, relating to the following:

- The profile over time, base and projections of the outcomes
- Review of suitability for target outcome (highlighting where measures have historically been used as targets and so are likely to continue to be suitable, where measures are new but likely to be suitable and measures that we do not consider to be suitable as targets)
- Assumptions for the projections
- A description of confidence in the forecast (further detail on this approach is provided in Annex C)
- Comparator measures with England & Wales
- Alignment with the Scottish Government's Water Sector Principles
- Mapping to the National Performance Framework (see also Annex A).
- Development requirements ahead of submission of the Final Business Plan (FBP)

For the draft business plan, the Table includes forecasts for 39 of the 44 lines in Table 1. The exclusions, which have been flagged to WICS in advance, are:

- *Communities measure (6):* The current Customer Experience Measures (CEMs) for communities across Scotland within households, non-households and developers. In addition to the main CEMs, a stakeholder CEM tracked interest from stakeholders like contacts, escalations, experience and perceptions from Scottish Members of the Scottish Parliament. While we continue to monitor information across our communities we do not have an additional measure as yet. Scottish Water considers this measure to be repetitive of data already collected through the currently reported CEMs and through the inclusion of the UKCSI measure. Further benefit may come from the development of a new 'Awareness' measure that would measure progress aligned to our Long-Term Strategy. Further information on this proposal is available in the Technical Appendix.
- *River quality (33).* Scottish Water does consider it to be appropriate to forecast or set outcomes for river water quality as this issue sits within the remit of SEPA. While

acknowledging our important role in river water quality, we consider it more appropriate for any such measure to be owned and reported by SEPA.

- *Climate change mitigation (42).* There is currently no formal biodiversity metric used in Scotland. Scottish Water is working with NatureScot, Scottish Government and other relevant stakeholders to define an appropriate metric, agree assessment guidelines and how measurements will be taken and audited. We will provide updates as this work progresses and a metric becomes available. Further information is available in the Technical Appendix.
- *Resource recovery (43).* A resource recovery measure will require much more engagement and development in order to ensure that it is a meaningful additional datapoint. Scottish Water notes that such a measure may be linked to the deployment of Advanced Anaerobic Digestion technology at Bioresource facilities. Scottish Water also notes that the benefits of resource recovery activities may already be captured as a reduction in carbon across operational or capital measures. Further engagement with WICS is required to understand the role and potential timeline involved in this type of measure.
- *Asset health (44*). We have included extensive submissions on asset health within Data Tables 3 and 4 from the early development work of the equipment health index. We have also explored options that consider how to form a single summary statistic for asset health that could monitor and drive better performance. Given the importance of this measure and the developing approaches being considered across utilities and regulators elsewhere in the United Kingdom, we consider it appropriate to work collaboratively with WICS and other stakeholders before firming up our proposal in this area. We set out our thoughts in this in the Technical Appendix, and have engaged separately with WICS to discuss the merits of alternative options.

For outcomes where WICS' guidelines invited Scottish Water to provide clarification of a definition, we confirm the following definitions have been applied:

- *ITS Repeats (14). The number of postcodes with repeat contacts of either ≥ 6 property contacts within 1 year or ≥ 10 property contacts within 3 years.*
- *Worst drought (15).* Repeat interruptions to water supply. Customers supplied by systems not capable of meeting demand during a worst historic drought. Population of customers supplied by systems not capable of meeting demand during a worst historic drought. Definition would include: Worst Historic Drought (assumed 1:150); Climate change adjustments would be made in line with climate adaptation plan. Includes the use of documented drought measures.
- *Peak demand (16):* Customers supplied by systems not capable of meeting peak demand. Population of customers supplied by systems not capable of meeting peak demand. Definition is based on peak period against WTW capacity and CAR licence (both summer and winter) and not considered peak network constraints and allows for Scottish Water tankering policy.

- *Lead in SW network (19):* Estimated number of lead pipes in public network. Estimated number of communication lead pipes remaining in public network.
- *Water risk assessment planning measure (22):* The number of WQ WSZ & Hazard Pairs above long term tolerable threshold (including those considered significant), based on thresholds of 42 from WRAP (Water Risk Assessment Platform) using likelihood x consequence.
- *Sewerage Infrastructure discharges (32)*: Number of UIDs (Unsatisfactory Intermittent Discharges), classified and prioritised in collaboration with SEPA.

In addition, we have amended the following previously communicate with WICS,

- *Indicator of lead in customer supply pipes (20)* Current WICS Definition: Percentage of random daytime regulatory samples with lead levels greater than 3 µg/l. Scottish Water proposal: Percentage of random daytime regulatory samples with lead levels **not** greater than 3 µg/l. This metric is more effectively framed in the positive. Whilst a simple inverse of the definition in the guidance, this approach would better align with internal reporting approaches.

Furthermore, two additional measures are in development. These are a Strategic Tracker, and an Awareness measure as discussed in the Technical Appendix. We have no projected outcomes for these at this point and hence do not include them in this commentary report.

3.2 Table 1 submission

The Table 1 submission is replicated below for each section of this report. Table 1 presents Scottish Water's forecast outcomes and associated level of service for customers, the environment, and other stakeholders. For each outcome, the forecast level of service is made annually for the SRC27 period and then in the final year for each of the three subsequent periods: SRC33, SRC39, and SRC45. For alternative Scenarios B and C, a forecast level of service in Year 6 of SRC27 is made. This report subsequently provides Commentary on each line within Table 1.

3.2.1 Customer Excellence

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.01	CEM	dCEM Developer Customer Experience Measure	Number	82.17	82.34	82.52	82.70	82.87	83.04	84.06	85.01	85.91	83.04	83.04
1.02	CEM	nhCEM Non Household Customer Experience Measure	Number	88.89	89.00	89.11	89.22	89.33	89.43	90.07	90.66	91.22	89.43	89.43
1.03	CEM	R-MeX Retailer Experience Measure	Number	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
1.04	CEM	hCEM Household Customer Experience Measure	Number	87.90	88.02	88.14	88.26	88.38	88.49	89.18	89.83	90.44	88.49	88.49
1.05	CEM	UKCSI UK customer Satisfaction Index	%	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9	77.9

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	Measure of Level of Service	Level of Service	Unit	Year 1 2027-28	Year 2 2028-29	Year 3 2029-30	Year 4 2030-31	Year 5 2031-32	Year 6 2032-33	SRC33	SRC39	SRC45	Scenario B Year 6 2032-33	Scenario C Year 6 2032-33
1.06	CEM	Communities measure	n/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 3: Customer excellence forecast level of service

Note: Communities measure has a nil return as discussed in Section 1.1.

3.2.2 Water continuity

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	Measure of Level of Service	Level of Service	Unit	Year 1 2027-28	Year 2 2028-29	Year 3 2029-30	Year 4 2030-31	Year 5 2031-32	Year 6 2032-33	SRC33	SRC39	SRC45	Scenario B Year 6 2032-33	Scenario C Year 6 2032-33
1.07	Leakage	Percentage reduction of three-year average leakage*	%	2.0%	2.9%	4.2%	5.8%	7.7%	9.9%	11.9%	13.9%	15.9%	9.9%	9.8%
1.08	Leakage	Leakage reduction in areas with supply-demand balance deficit*	%	2.2%	3.3%	5.1%	7.2%	9.8%	12.9%	14.9%	16.9%	18.9%	12.9%	12.8%
1.09	Business demand	Percentage reduction of consumption at non-household premises*	%	3.0%	4.2%	6.5%	9.5%	12.9%	16.2%	21.9%	21.9%	21.9%	16.2%	16.2%
1.10	Per capita consumption (PCC)	Three-year average per capita consumption*	l/person /d	177	176	176	175	175	174	165	150	140	174	174
1.11	Customers receiving low pressure	Number of properties on the low pressure register	Number	36	39	31	28	27	26	23	20	15	26	26
1.12	Unplanned interruptions	Unplanned interruptions greater than 6 hours, excluding 3rd party	Number	6,750	6,750	6,750	6,750	6,750	6,750	6,500	6,000	5,000	6,750	7,425
1.13	Planned and unplanned interruptions	Average minutes lost due to water supply interruptions (over 3 hours)*	min	15.00	15.00	15.00	15.00	15.00	15.00	14.50	14.00	13.00	15.00	16.50

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.14	Unplanned interruptions	Repeat interruptions to water supply	Number	270	300	275	250	225	200	160	120	60	200	240
1.15	Water availability	Customers supplied by systems not capable of meeting demand during a worst historic drought	Number	2,990,000	2,999,000	3,008,000	3,016,000	3,024,000	2,328,000	1,500,000	750,000	200,000	2,328,000	2,328,000
1.16	Water availability	Customers supplied by systems not capable of meeting peak demand	Number	657,000	693,000	662,000	663,000	667,000	346,000	250,000	150,000	50,000	346,000	346,000

Table 4: Water continuity forecast level of service

3.2.3 Water quality

			Column reference	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.17	Drinking water aesthetics	Taste and odour contacts*	Number	0.51	0.52	0.53	0.52	0.53	0.53	0.45	0.40	0.30	0.53	0.53
1.18	Drinking water aesthetics	Discolouration and aeration contacts*	Number	2.11	2.11	2.11	2.09	2.09	2.08	1.50	1.20	0.60	2.08	2.08
1.19	Drinking water quality	Estimated number of lead pipes remaining in public network	Number	42,550	39,550	36,550	33,550	30,550	27,550	9,600	0	0	27,550	27,550
1.20	Drinking water quality	Indicator of lead in customers supply pipes	%	98.04%	98.06%	98.08%	98.11%	98.13%	98.15%	98.30%	98.40%	98.50%	98.15%	98.15%
1.21	Drinking water quality	Total drinking water compliance	%	99.94%	99.94%	99.94%	99.95%	99.95%	99.95%	99.96%	99.97%	99.98%	99.95%	99.95%
1.22	Drinking water quality	Drinking water quality risks across all systems above long-term tolerable threshold.	Number	7,254	7,267	7,180	6,994	6,807	6,465	5,200	3,800	2,500	6,415	6,465
1.23	Drinking water quality	Number of DWQR declared incidents	Number	30	29	28	27	26	25	21	15	10	21	25

Table 5: Water quality forecast level of service

3.2.4 Wastewater flows

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.24	Internal sewer flooding	Number of internal sewer flooding incidents*	Number	1.53	1.52	1.51	1.50	1.49	1.48	1.63	1.79	1.94	1.48	1.48
1.25	Internal sewer flooding	Number of properties at risk of internal flooding	Number	1.65	1.69	1.61	1.61	1.59	1.51	1.84	1.29	0.17	1.31	2.07
1.26	External sewer flooding	Number of external sewer flooding	Number	10.62	10.75	10.87	10.99	11.11	11.24	11.97	13.44	12.83	11.24	11.24
1.27	External sewer flooding	Number of properties at risk of external flooding	Number	11.43	11.52	11.61	11.70	11.79	11.88	12.64	11.26	5.41	11.80	11.88

Table 6: Wastewater flows forecast level of service

3.2.5 Water environment

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	Measure of Level of Service	Level of Service	Unit	Year 1 2027-28	Year 2 2028-29	Year 3 2029-30	Year 4 2030-31	Year 5 2031-32	Year 6 2032-33	SRC33	SRC39	SRC45	Scenario B Year 6 2032-33	Scenario C Year 6 2032-33
1.28	Discharge Permit Compliance	Percentage compliance with SEPA discharge permits	%	96.37%	96.37%	96.37%	96.37%	96.37%	96.37%	96.89%	97.58%	98.44%	96.37%	96.37%
1.29	Serious pollution incidents (EPI Cat 1/2)	Number of serious pollution incidents*	Number	8	7	7	6	6	5	4	3	2	5	5
1.30	Total pollution incidents (all categories)	The total number of pollution incidents from a sewerage asset affecting the water environment*	Number	34.76	34.76	34.76	34.76	34.76	34.76	32.00	30.00	28.00	34.76	34.76
1.31	Sludge compliance	Percentage unsatisfactory sludge disposal	%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
1.32	Sewerage infrastructure discharges	Unsatisfactory intermittent discharges	Number	850	811	809	806	799	748	550	300	0	708	748
1.33	River water quality	River water quality measure	n/a	0	0	0	0	0	0	0	0	0	0	0

Table 7: Water environment level of service

Note: River water quality has a nil return as discussed in Section 1.1.

3.2.6 Carbon emissions

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.34	Net Zero Emissions	Net Zero Emissions	tCO2e	243,869	190,714	172,114	155,889	103,900	84,994	36,589	-5,684	-24,936	88,461	74,361
1.35	Operational emissions	Operational emissions (water)	tCO2e	56,366	36,425	31,714	27,520	8,260	2,314	757	527	527	2,314	2,314
1.36	Operational emissions	Operational emissions (wastewater)	tCO2e	95,172	74,811	69,680	65,360	41,789	35,717	33,353	32,955	32,955	35,717	35,717
1.37	Operational emissions	Percentage reduction in operational emissions compared to 2006-07 baseline	%	32.80%	24.08%	21.95%	20.10%	10.83%	8.23%	7.38%	7.25%	7.25%	8.23%	8.23%
1.38	Operational emissions	Operational emissions (net emissions)	tCO2e	141,841	96,542	84,449	75,160	30,763	14,461	-20,574	-48,033	-53,354	14,461	14,461
1.39	Climate change mitigation	Investment emissions	tCO2e	102,028	94,172	87,665	80,729	73,137	70,533	57,163	42,349	28,418	74,000	59,900
1.40	Climate change mitigation	Carbon capture/sequestration	tCO2e	-9,697	-14,693	-16,944	-17,720	-19,285	-23,569	-54,684	-81,514	-86,835	-23,569	-23,569

Table 8: Carbon emissions forecast level of service

3.2.7 Biodiversity

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.41	Climate change mitigation	Biodiversity and Nature Based Solutions (land use input metric)	land footprint (hectare)	750	1,500	2,250	3,000	3,750	4,500	4,500	4,500	4,500	4,500	4,500
1.42	Climate change mitigation	Biodiversity outcomes measure	n/a	0	0	0	0	0	0	0	0	0	0	0
1.43	Resource recovery	Resource recovery measure	n/a	0	0	0	0	0	0	0	0	0	0	0

Table 9: Biodiversity forecast level of service

Notes: The Biodiversity outcomes line has a nil return at this point. It is in development with Nature Scott as discussed in the Technical Appendix for Performance Monitoring. The Resource recovery line has a nil return as discussed in Section 1.1

3.2.8 Asset health

As stated in Section 1.1 this is in development. This is also discussed in the Technical Appendix and not discussed further in this commentary report.

			Column reference	1	2	3	4	5	6	7	8	9	10	11
Line ref.	**Measure of Level of Service**	**Level of Service**	**Unit**	**Year 1 2027-28**	**Year 2 2028-29**	**Year 3 2029-30**	**Year 4 2030-31**	**Year 5 2031-32**	**Year 6 2032-33**	**SRC33**	**SRC39**	**SRC45**	**Scenario B Year 6 2032-33**	**Scenario C Year 6 2032-33**
1.44	Asset health	Equipment/asset health index	n/a developing	0	0	0	0	0	0	0	0	0	0	0

Table 10: Asset health forecast level of service

3.3 Conclusion

This commentary report proceeds to provide additional information and explanation for the outcomes where forecasts have been made, on a line-by-line basis. In addition

- Annex A includes the expenditure change from Scenario A of Scenarios B and C.
- Annex B includes a mapping of each line to the Scotland's National Performance Framework.
- Annex C includes the confidence grade for each line.
- Annex D includes a full set of definitions.

4 Customer Excellence

4.1 Summary

Performance measures The projected outcomes for the current CEMs are projected to continued steady progress based on a 3-year moving average.

The three main CEMs are Scottish Water's primary tool for measuring how well we are serving household and non-household customers.

- Developer CEM (dCEM): Customers requiring a water and/or wastewater connection
- Non-Household CEM (nhCEM): Businesses and licenced providers
- Household CEM (hCEM): Household customers.

Each CEM score is calculated out of a score starting from 100, with deductions made from several elements (e.g. formal complaints, service issue contacts, upheld regulatory complaints). Points cannot be regained, but proactive approaches and timely repairs can prevent future losses. The measures are a fundamental and well-established part of transforming the way we work. Through these targeted measures and analysis of the data behind them, we are better able to understand customers, where points are being lost and where there is a need to drive to resolve and reduce points lost to provide a better experience.

For SRC27 (2027-32) each CEM is predicted to have steady progress. The reduction in points lost is c6% for each over the period to 2033. All three CEMs are projected using a 3-year rolling average. Currently dCEM is projected using 2 historic years, 3 year projections will be available at the 2024/25 outturn.

Comparator measures

The UKCSI and R-Mex measures are comparator measures with English and Welsh companies. Scottish Water has observed these measures but has not previously adopted a formal method for the reporting of their comparison. This comparison is focussed on the position of SW relative to the other companies rather than the absolute score itself. This is because the score itself might be affected by fluctuations in perceptions of the water sector as a whole which therefore does not reflect individual company performance itself. The projected outcomes for the comparator metrics are based on a relative score rather than absolute score.

A further sample from the same national survey for UKCSI can be taken of the England & Wales water and wastewater companies and enable their average score to be compared with the benchmarked survey score. This provides a means of comparison of customer satisfaction between Scotland and England & Wales.

Scottish Water currently has a leading or relatively high position.

Excluded measures

We have excluded reference to a new communities measure. For SRC21 we developed a measure called sCEM which focused on external stakeholder contacts, escalations, experience and perceptions amongst for example, Scottish Members of Parliament. The number of contacts in this area was limited and as a result the measure was subject to high levels of variation. As such it was not included in Scottish Water's outcome measures but was monitored for periods of high and low activity.

For SRC27, Consumer Scotland asked us to consider a new communities measure. The three existing CEMs reflect the contacts, escalations, experience and perceptions of communities across Scotland within households, non-households and developers. We have sought to focus on the development of a new measure aligned to our Long-Term Strategy that is related to supporting the drive to influence per capital consumption and blockages as these are areas that we know community action and engagement can most effectively impact the service we provide. As per our Customer and Community Excellence Technical Appendix and our Customer Engagement Technical Appendix, we will also continue to develop analysis and understanding of all communities in Scotland to build up a richer source to improve the customer experience.

Scottish Government Water Sector Principles

All these metrics relate to Principle 1 which is as follows:

Water is a precious resource – it is essential for life. It supports our lives, agriculture and businesses (including distilleries and manufacturing etc.) and supports our environment. We will need to consider the water needed to water crops to maintain food supplies, or make different choices about the crops we grow, support tourism and to support new lower carbon industry, such as hydrogen production. At the same time, we must ensure we have enough water to provide drinking water supplies which are essential for public health and to protect Scotland's environment.

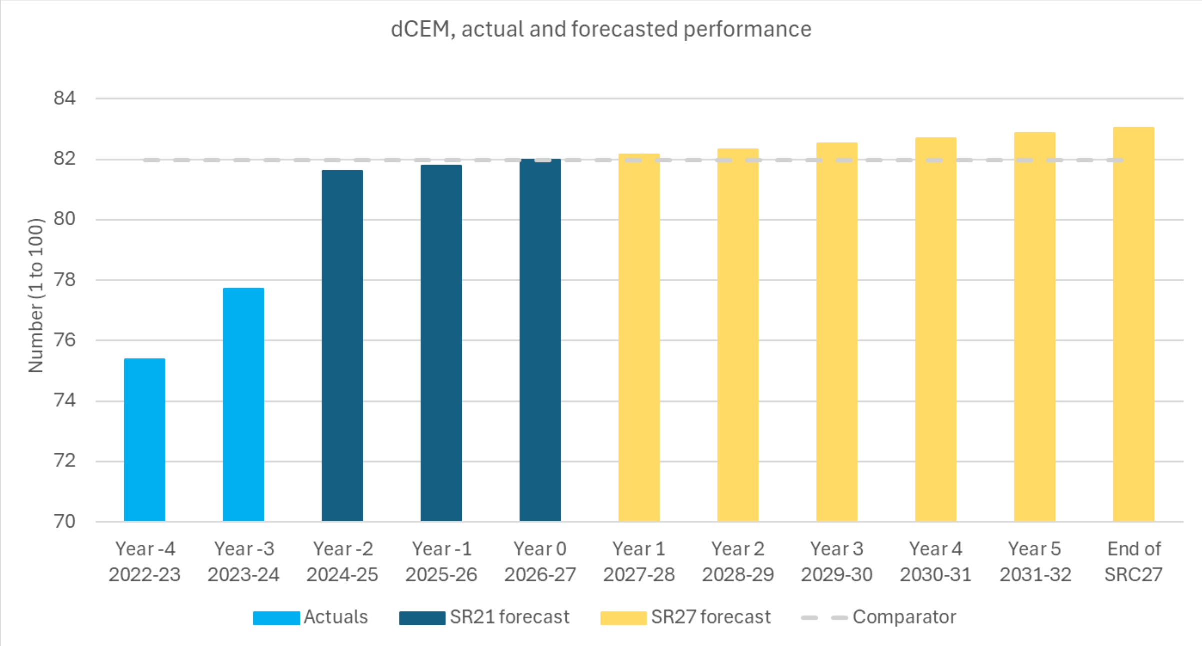
National Performance Framework

The main National Performance Framework outcome category is aligned to Communities - Inclusive empowered resilient and safe communities. This includes, for example, local area perception. The CEMs include contacts and experience from incidents such as taste & odour, discoloration or interruptions to supply and reflects local area perceptions. As such the CEMs are additional indicators to those identified in the National Performance Framework related to Communities.

Development for Final Business Plan

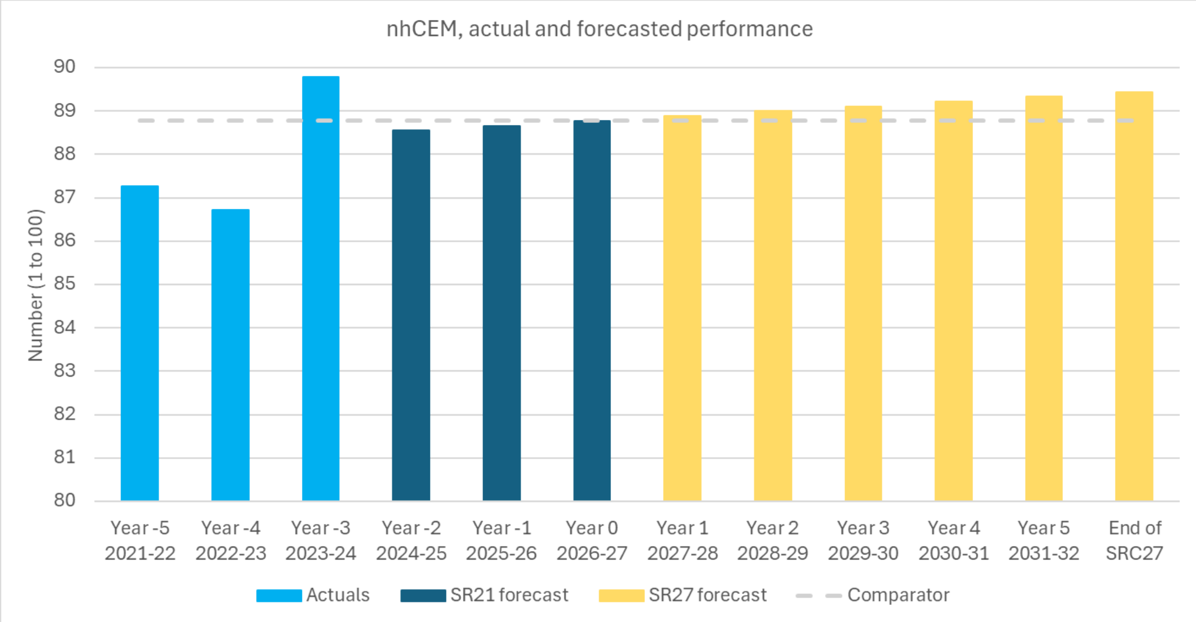
Between Draft and Final business plan we expect to update 2024/25 data for the existing CEM metrics. The new CEM metrics will require further testing and development for their introduction into a new target-outcome Monitoring Framework.

4.2 dCEM (Table 1 line 1)

Reference	Line reference 1.01 - CEM - Developer Customer Experience Measure (Number)
Definition	The Developer Customer Experience Measure (dCEM) score.
Plot	
Base figures	The 2023/24 score was 77.71.
Basis of projection	The remaining three years of this periods are 81.62, 81.80, 81.99 respectively. The initial year of SRC27 is formed using on a 2-year rolling average and subsequent years on a 3-year rolling average.
Forecast commentary to SRC45	The forecast reflects gradual long-term improvement.

Range of confidence	The forecast is B3. “B” based on the method used which is extrapolation (3-year moving average). It has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. “3” is a medium level of uncertainty.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the scale of the change in investments between scenarios will have limited impact.
Target Suitability	Historically has been used within short term performance improvement targets.
Target Type	The outcome is to be maximised.
Target	The outcome is to be maximised with 6% reduction in points lost
Sources	Use of historic data.
Financial assumptions and dependencies	Assumed that (i) current level of house building activity in the market; (ii) current level of commercial premise development in the market; (iii) continued investment in online /self-serve service development (iv) the continued Strategic approach to support and enable development in Scotland.
Operational assumptions	The performance in dCEM has a significant interdependence on access to operational support and capacity to enable connections. Therefore, there is an operational assumption that the existing level of connection support is maintained.
External assumptions	Wider economic performance that will determine the development market as a whole. We are currently experiencing a dip in demand. An increase in demand will require increased capacity operationally, increasing dependence and investment in digital channels and overall growth funding.
Additional information	No additional information
Development to FBP	Update for 2024/25 outturn.

4.3 nhCEM (Table 1 line 2)

Reference	Line reference 1.02 - CEM - nhCEM Non-Household Customer Experience Measure (Number)
Definition	The non-household Customer Experience Measure (nhCEM) score.
Plot	
Base figures	The 2023/24 score was 89.79.
Basis of projection	The remaining three years of this periods are 88.55, 88.66, 88.78 respectively. The initial year of SRC27 is formed using a 2-year rolling average and subsequent years on a 3-year rolling average.
Forecast commentary to SRC45	The forecast reflects gradual long-term improvement.
Range of confidence	The forecast is B3. “B” based on the method used is extrapolation (3-year moving average). It has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. “3” is a medium level of uncertainty.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the scale of the change in investments between scenarios will have limited impact.
Target Suitability	Historically is has been used within short term performance improvement targets.
Target Type	The outcome is to be maximised.

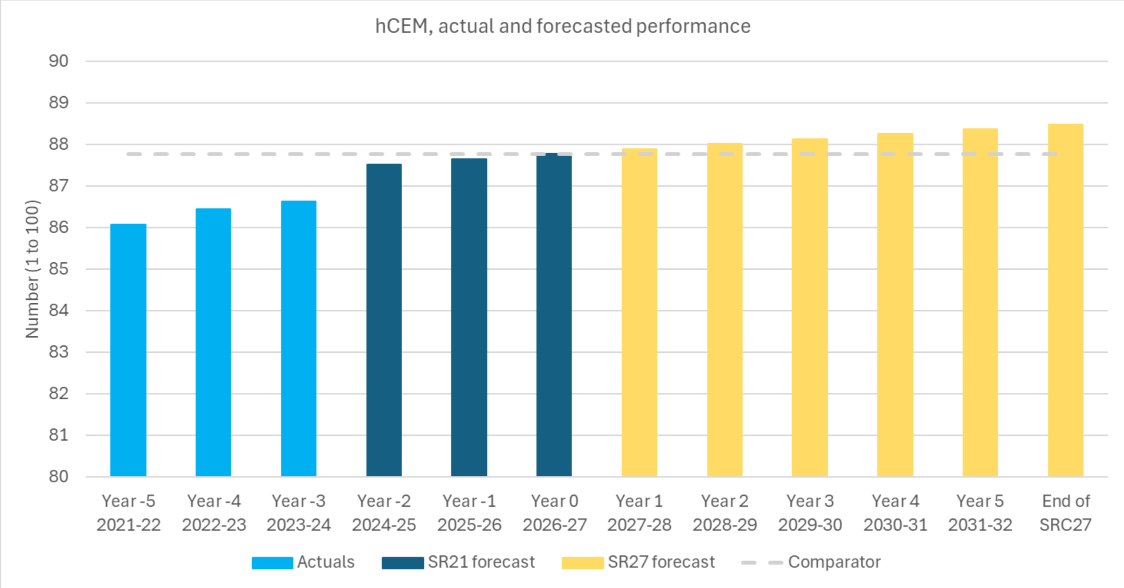
Target	6% reduction in points lost
Sources	Use of historic data.
Financial assumptions and dependencies	Assumptions: • Capital investment in the water and waste network at a minimum keeps pace with SR21 • Operational investment and strategies to target customer experience remain consistent
Operational assumptions	• Implementation of smart metering for Non-Household (NHH) customers doesn't have a material impact on Service Issue Contacts • Operational response continues to focus on improving customer experience for non-households. • No major impact from the introduction of smart meters. • No major changes to the charging for capacity for developers.
Additional information	No additional information
Development to FBP	Update for 2024/25 outturn.

4.4 R-MeX (Table 1 line 3)

Reference	Line reference 1.03 - CEM - R-MeX
Definition	Survey of retailers (licensed providers) regarding their experience of service levels from Scottish Water as wholesaler. Mirrors MOSL's bi-annual RMeX survey in England. Conducted by external partner on Scottish Water's behalf in liaison with MOSL to ensure alignment
Plot	n/a
Base figures	The latest absolute score is used for completion of Table 1. We have not formed a projection for the absolute figure. We have instead considered the relative position for Scottish Water in the survey of all UK water wholesale providers.
Basis of projection	n/a
Forecast commentary to SRC45	n/a
Range of confidence	C3 as source sampling and methods might change and affect the score outwith our control
Scenarios	n/a
Target Suitability	Expected to be a target outcome
Target Type	The outcome is to be maximised.
Target	Our proposal is to be in the upper quartile of UK water sector wholesalers.
Sources	External Survey by MOSL (Market Operator Services Limited)
Financial assumptions and dependencies	We assume • continued investment in Licence provider portal to maintain alignment with user experience on MOSL hub in England. • Investment approval for full roll-out of smart metering to non-household customers as currently planned. • capital investment in the water and waste network at a minimum keeps pace with SRC21. • continuous improvement on current process whilst retaining the good performance evidenced by the results.
Operational assumptions	Operational investment and strategies to target customer experience remain consistent
Additional information	There are three other measures from the Market Performance Framework:

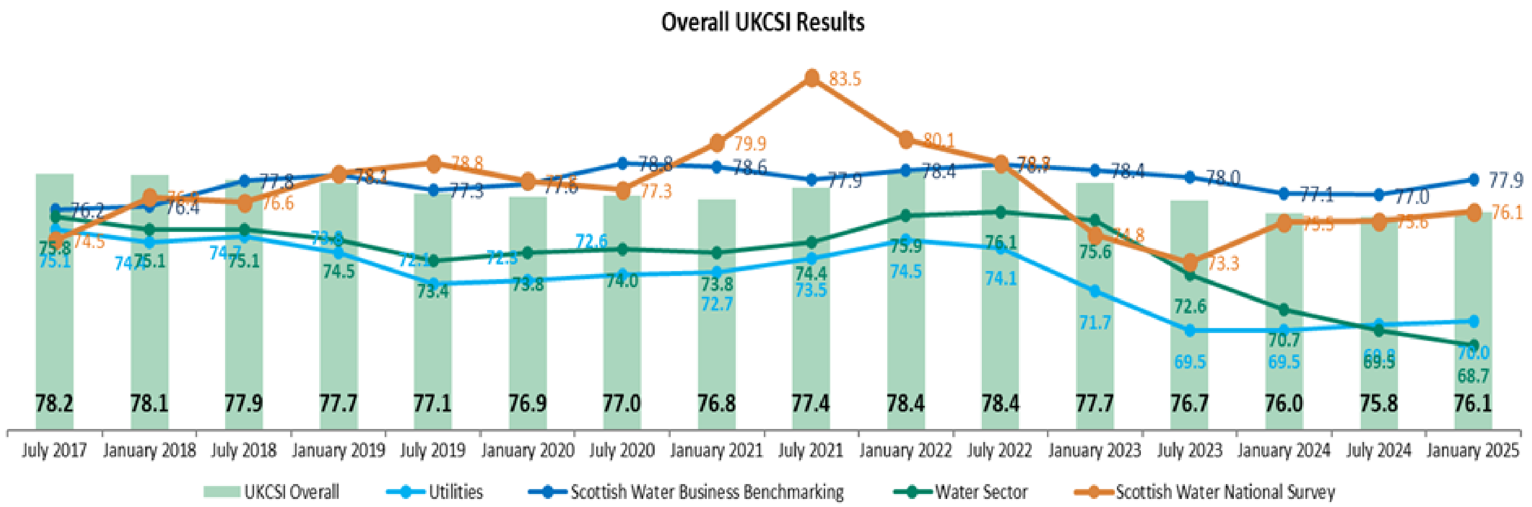
	○ M12 –proportion of premises with verified supply address and premises data. This relates to a specific data assurance project which has been run in England by MOSL and is not relevant in Scotland where Supply Points have previously been cross-referenced to Scottish Assessors' data or populated with a valid absence code. For this reason, we do not propose adopting the M12 measure. ○ M15 – total and average days late for late operational requests from retailers. We consider that this would provide a valuable age metric on overdue work and benchmark against English wholesalers so would propose to adopt this measure for SR27 ○ M18 - proportion of SLAs completed in month completed on time. We already monitor Scottish Water compliance monthly and compare against performance in England (for those SLAs which are directly comparable across both markets) six-monthly for benchmarking purposes.
Development to FBP	No further development is expected.

4.5 hCEM (Table 1 line 4)

Reference	Line reference 1.04 - CEM - hCEM Household Customer Experience Measure (Number)
Definition	The household Customer Experience Measure (dCEM) Definition Document 1 Version 4.
Plot	
Base figures	The annual 2023/24 score was 86.63.
Basis of projection	The remaining three years of this periods are 87.53, 87.65, 87.78 respectively. The initial year of SRC27 is formed using on a 2-year rolling average and subsequent years on a 3-year following average.
Forecast commentary to SRC45	The forecast reflects gradual long-term improvement.
Range of confidence	The forecast is B3. “B” based on the method used is extrapolation (3 year moving average), it has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. “3” is a medium level of uncertainty.

Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the scale of the change in investments between scenarios will have limited impact.
Target Suitability	Historically is has been used within short term performance improvement targets.
Target Type	The outcome is to be maximised.
Target	6% reduction in points lost.
Sources	Use of historic data.
Financial assumptions & dependencies	Investment levels should enable maintenance of current customer service levels. Digital investment continuing in self-serve portals and channel management. Investment decisions are informed by customer impact insight – Community map and SCBA
Operational assumptions	This outcome has an interdependence on being able to increasingly manage customer engagements during issues proactively and through increasingly accessible self-serve functionality. Our proposed digital investment is required to maintain this strategy in the period and achieve consistently high service experiences.
External assumptions	Customer experience of 'competing' service providers will drive expectations of SW in terms of channels etc. Media and stakeholder narrative is recovered and steady throughout – demonstrating a level of confidence in the water sector and SW.
Other assumptions	Household metering and monitoring is not rolled out in the period as this would result in a change in contact levels and transactional survey approach and sample.
Additional information	No additional information
Development to FBP	Update for 2024/25 outturn

4.6 UKCSI (Table 1 line 5)

<table>
<tr><td>Reference</td><td>Line reference 1.05 - UKCSI</td></tr>
<tr><td>Definition</td><td>The UK Customer Satisfaction Index (UKCSI) is the national barometer of customer satisfaction published twice a year by The Institute of Customer Service since 2008. It is an independent, objective benchmark of customer satisfaction on a consistent set of measures on 282 organisations and organisation types across 13 sectors. The SW score is determined in a benchmark survey undertaken by UKCSI.</td></tr>
<tr><td>Specific proposal</td><td>Our proposal for targeting is to –
• Use Scottish Waters business benchmark survey results; these provide a more robust and consistent base size. (However, if this is for reporting to WICS, Scottish Water's national score may be more appropriate – as it aligns fully to the methodology used in England and Wales and is externally published data).
• Approach targeting in similar manner to OFWAT (no more than 5 points below UKCSI Overall average) but recognising Scottish Water's sustained positive performance when setting the target itself. We therefore propose a target of Scottish Waters Business Benchmarking score is either above or >1 points above the UKCSI Overall average score.</td></tr>
<tr><td>Plot of historic performance relative to survey samples</td><td>

The plot shows a relatively stable blue line of the benchmark survey and an unsteady orange line of SW position in the national survey as it is affected by small samples.</td></tr>
</table>

Base figures	The latest absolute score is used for completion of Table 1. We have not formed a projection for the absolute figure. We have instead considered the relative position for Scottish Water from the UKCSI benchmark survey relative to the average score from the national survey of all UK companies.
Basis of projection	n/a
Forecast commentary to SRC45	n/a
Range of confidence	C3 as source sampling and methods might change and affect the score for reasons outside of SW's control
Scenarios	n/a
Target Suitability	Expected to be a target outcome
Target Type	The outcome is to be maximised.
Target	The benchmarked score for Scottish Water to be above the average of the UKCSI national survey score
Sources	UKCSI survey.
Financial assumptions and dependencies	Maintaining and improving service.
Operational assumptions	Progression of customer experience measure score
Additional information	A further sample from the same national survey for UKCSI can be taken of the England & Wales water and wastewater companies and enable their average score to be compared with the benchmarked survey score. This provides a means of comparison of customer satisfaction between Scotland and England & Wales. A comparison of two survey waves with the Water companies in England and Wales is provided below.

	(table below)
Development to FBP	No further development is expected.

Water Company	Jan-25	Change Vs Jul 24	Change Vs Jan 24
Scottish Water	**77.9**	0.9	0.8
Portsmouth Water	**73.3**	N/A	N/A
Dwr Cymru (Welsh Water)	**72.8**	-1.9	-4.4
Bristol Water	**72.7**	-3.4	-4.1
Northern Ireland Water	**71.8**	-4	N/A
SES Water	**70.7**	N/A	N/A
Northumbrian Water	**70.7**	1.7	-4
Wessex Water	**70.4**	0.7	-0.7
South Staffordshire Water	**70.3**	2.6	N/A
Anglian Water	**69.7**	-2.4	-4.4
United Utilities (Water)	**69.7**	-3.2	-6.6
Affinity Water	**69.6**	-1.2	-4.9
Severn Trent Water	**69.5**	-1.9	-3.5
Essex and Suffolk Water	**68.8**	-1.2	N/A
Yorkshire Water	**68.6**	-2.2	-2.8
South East Water	**68.0**	-0.1	-3.5
South West Water	**64.5**	-0.6	-3.4
Thames Water	**62.0**	-1	-4.5
Southern Water	**60.6**	-0.6	-2.2

5 Water Continuity

5.1 Summary

Performance measures
The metrics of total leakage, low pressure on the register and unplanned interruptions to supply above 6 hours form part of the current Overall Performance Assessment (OPA). In contrast the following metrics are new:

- Business demand
- Per capita consumption
- Leakage in zones with supply demand balance deficit
- Repeat interruptions to supply
- Worst drought
- Peak demand.

Comparator metrics
The WICS Guidance identifies several metrics as offering the potential for benchmarking with England & Wales including:

- Business demand
- Per capita consumptions
- Average minutes lost
- Total leakage
- Leakage in deficit zones.

We note that the 'Economic Level of Leakage' is relatively high in Scotland because of factors like gravitational flows that reduce the need for pumping. Without smart metering and household metering, business and per capita consumption is relatively higher in Scotland, and we include a comparison of the per capital consumption - in SRC27 all businesses will have smart meters and consequently we would expect the difference in business demand in E&W to start to close. The nature of our network is less interconnected (less radial and more spurred) which also means that we have relatively higher average minutes lost.

Our Business Plan aims to drive improvement where it is of most value to our customers, which includes reductions to leakage, repeat ITS, business demand and improvements to water supply resilience.

Excluded measures
Outcomes are forecast for all the metrics listed by WICS.

Scottish Government Water Sector Principles
All of these metrics relate to Principle 1 which is as follows:

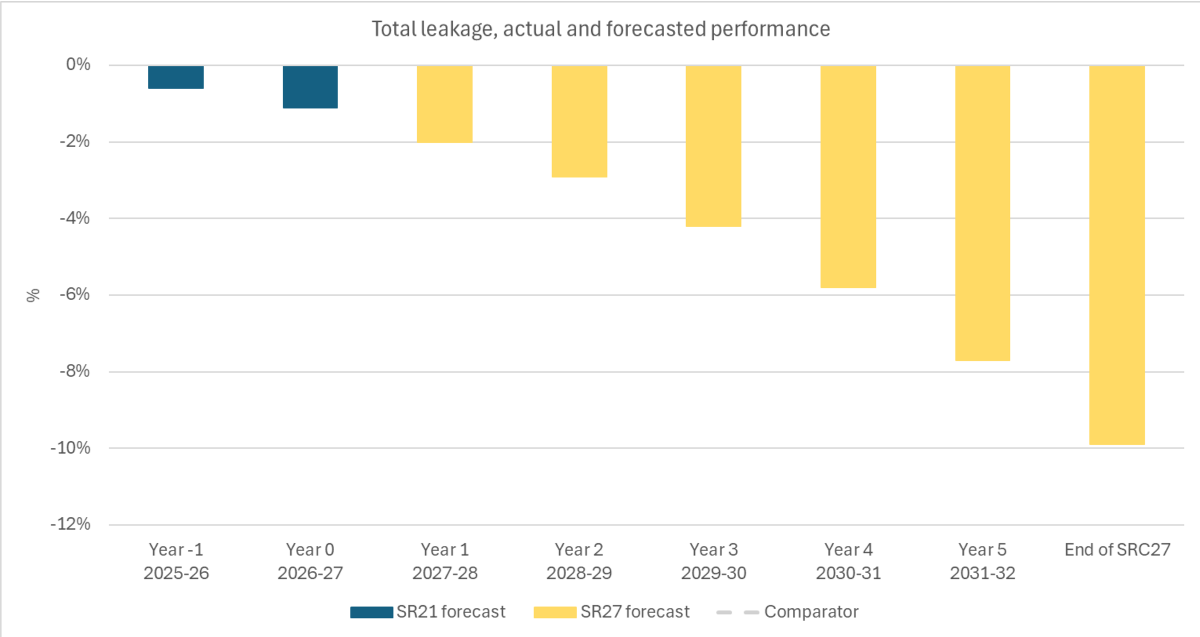
Water is a precious resource – it is essential for life. It supports our lives, agriculture and businesses (including distilleries and manufacturing etc.) and supports our environment. We will need to consider the water needed to water crops to maintain food supplies, or make different choices about the crops we grow, support tourism and to support new lower carbon industry, such as hydrogen production. At the same time, we must ensure we have enough water to provide drinking water supplies which are essential for public health and to protect Scotland's environment.

National Performance Framework
The main national Performance Framework outcome categories covered by these metrics are:

- Health – Health and Active
- Economy – A strong competitive economy.

Development for Final Business Plan
The forecast outcomes for the Worst drought and Peak demand metrics are provisional and will require further technical development ahead of submission of the FBP.

5.2 Total Leakage (Table 1 line 7)

Reference	Line reference 1.07 - Leakage - Percentage reduction of three-year average leakage* (%)
Definition	The percentage reduction of three-year average leakage from a 2024-25 baseline (i.e. AR23/AR24/AR25 inclusive). Three-year average values are calculated from annual average values for the reporting year and two preceding years and expressed in Ml/d. All values reported as a post-Maximum Likelihood Estimation (MLE) figure. Annual average leakage is defined as the sum of distribution system leakage, including service reservoir losses, trunk main leakage, and customer supply pipe leakage. The measure is reported based on the calendar year.
Plot	
Base figures	The 3-year average of Ml/d to 2024/25 is 456 Ml/d. The percentage reduction of three-year average leakage in Ml/d from a 2024-25 baseline. Three-year average values are calculated from annual average values of Ml/d for the reporting year and two preceding years and expressed in Ml/d.
Basis of projection	The forecast is for a reduction in the 3-year average Ml/d to 451 by the end of SR21 and to 411 by the end of SR27. The projection includes 1Ml/d year on year improvement forecast due to roll out of NHH metering programme, rehabilitation of distribution mains and ongoing improved find and fix methodology (i.e. emerging technologies and processes). The profile is backend loaded due to time taken for non-domestic smart metering and mains rehabilitation investments to be delivered.

	For annual total leakage, the level reduces by 48 Ml/d between 2026/27 and 2032/33 (see additional information below). This estimate is formed from reductions of 25 Ml/d from non-household smart meters, 20 Ml/d from direct implementation in pressure management and find and fix for the customer and network and 3 Ml/d of mains rehabilitation renewals.
Forecast commentary to SRC45	The projection to SRC45 assumes a further reduction to 380Ml/d of 2% for each of the subsequent 3 regulatory periods. This assumes a further reduction of 15Ml/d from non-household business and 5M/d from mains rehabilitation renewal.
Range of confidence	The forecast is B3. “B” based on the method used is extrapolation, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is considered to be sufficiently reliable for target outcomes. “3” is a medium level of uncertainty.
Scenarios	The scenarios A and B has the same outcome. The outcome for Scenario C is marginally less due to the reduction in mains rehabilitation of 300 to 250 km per year.
Target Suitability	The metric is suitable and is used in OPA.
Target Type	The reduction is to be maximised.
Target	9.9% reduction from 3 year rolling average set in 2024/25.
Financial assumptions and dependencies	An allocation will be made available to transition from the 2024/25 position. At current prices this equates to c.£60m in additional investment with increased tier 1 budgets as the period progresses to ensure we can maintain at a lower level of leakage.
Operational assumptions	Our operational framework partnership will support reductions in leakage in zones particularly where it is most challenging
Additional information	More severe cold snaps in winter and longer drier summers will impact our leakage natural rate of rise. There is also a review of the leakage calculation methodology being carried out by OFWAT, which will conclude before 2029. We will be involved in this review so we maintain a comparator view of leakage levels, but it may impact on reported values at different times due to our investment cycle. See Section 3.3 for further details and relationship with zonal leakage.
Development to FBP	The forecast can be updated with 2024/25 outturn.

Addition information

The annual and 3-year levels of leakage for the percentage change movements in Table 1 are set out. Figure 1 sets out the historic performance of the Zonal Leakage (MLE) in deficit zones. Figure 2 shows the forecast

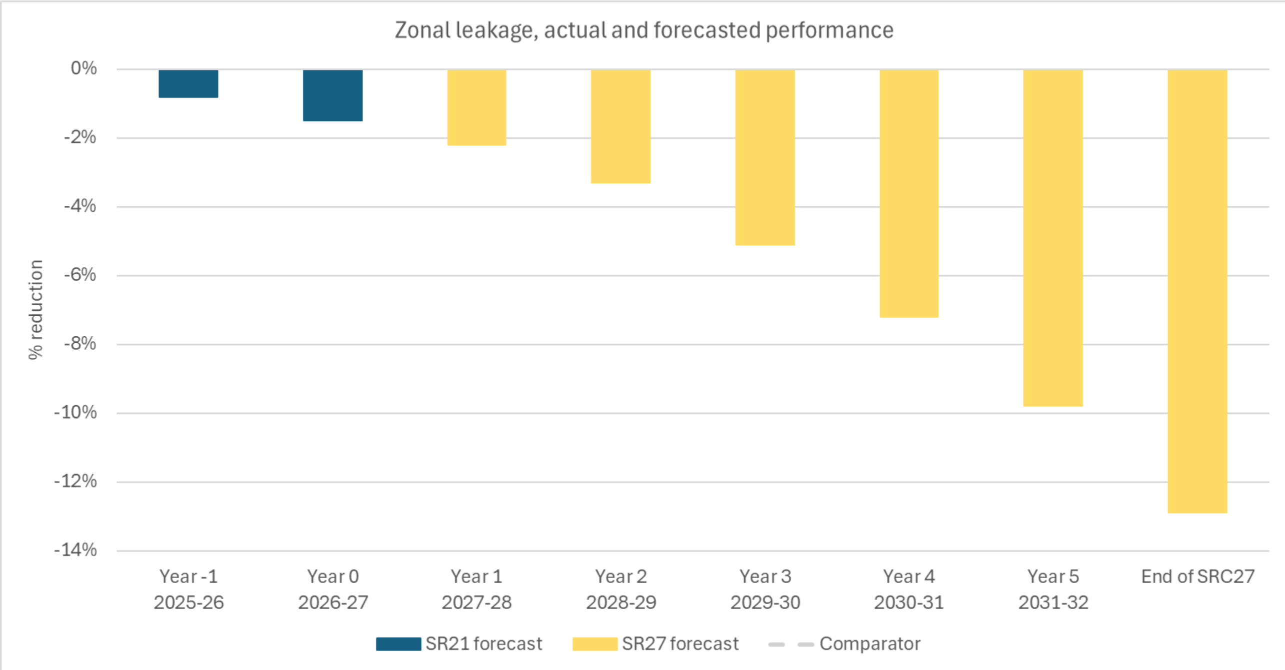
Scottish Water – total leakage	AR20	AR21	AR22	AR23	AR24	AR25
Annual average	464.40	462.63	458.39	453.71	461.84	[452.00]
Rolling average AR20-22	461.81					
Rolling average AR21-23		458.24				
Rolling average AR22-24			457.98			
Rolling average AR23-25				455.85		

Figure 1: Annual and 3 year rolling trends from AR20

	Baseline YR YR4	YR5	YR6	YR1	YR2	YR3	YR4	YR5	YR6
	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033
YR AV	454	450 -4	448 -2	443 -5	437 -6	430 -7	421 -9	411 -10	400 -11
3YR AV	*456*	*453*	*452*	447	443	437	429	421	411
% Reduction from Baseline		*-0.6%*	*-1.1%*	*-2.0%*	*-2.9%*	*-4.2%*	*-5.8%*	*-7.7%*	*-9.9%*
% Reduction in YR	-	*-0.6%*	*-0.6%*	-0.8%	-1.0%	-1.4%	-1.7%	-2.0%	-2.4%

Figure 2 – projection of %reduction of total leakage from baseline year 24/25

5.3 Zonal Leakage (Table 1 line 8)

Reference	Line reference 1.08 – Zonal Leakage - Percentage reduction of three-year average leakage in deficit zones (%)
Definition	The percentage reduction of three-year average leakage from a 2024-25 baseline (i.e. AR23/AR24/AR25 inclusive) for zones defined as being in supply demand deficit in year 2024/25. Three-year average values are calculated from annual average values for the reporting year and two preceding years and expressed in Ml/d. All values reported as a post-Maximum Likelihood Estimation (MLE) figure. The measure is reported based on the calendar year.
Plot	
Base figures	The 3-year average of Ml/d to 2024/25 is 233 Ml/d. The percentage reduction of three-year average leakage in Ml/d from a 2024-25 baseline. Three-year average values are calculated from annual average values of Ml/d for the reporting year and two preceding years and expressed in Ml/d.

Basis of projection	The forecast is for a reduction in the 3-year average Ml/d to 230 by the end of SR21 and to 203 by the end of SR27. The projection includes 1Ml/d year on year improvement forecast due to roll out of NHH metering programme, rehabilitation of distribution mains and ongoing improved find and fix methodology (i.e. emerging technologies and processes). The profile is backend loaded due to time taken for non-domestic smart metering and mains rehabilitation increase to build.
Forecast commentary to SRC45	The projection to SRC45 assumes a further reduction to 380Ml/d of 2% for each of the subsequent 3 regulatory periods.
Range of confidence for SRC27 period	The forecast is B3. “B” based on the method used is extrapolation, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. “3” is a medium level of uncertainty.
Scenarios	The scenarios A and B has the same outcome. The outcome for Scenario C is marginally less due to the reduction in mains rehabilitation of 300 to 250 km per year.
Target Suitability	The total leakage metric is suitable and is used in OPA and this is a subpart of the same metric for deficit zones.
Target Type	Outcome % reduction to be maximised.
Target	12.9% reduction from 3 year rolling average set in 2024/25.
Financial assumptions and dependencies	An allocation will be made available to transition from the 24/25 position. At current prices this equates to c.£60m in additional investment with increased tier 1 budgets as the period progresses to ensure we can maintain at a lower level of leakage.
Operational assumptions	Our operational framework partnership will support reductions in leakage in zones particularly where it is most challenging
Additional information	More severe cold snaps in winter and longer drier summers will impact our leakage natural rate of rise. There is also a review of the leakage calculation methodology being carried out by OFWAT, which will conclude before 2029. We will be involved in this review so we maintain a comparator view of leakage levels, but it may impact on reported values at different times due to our investment cycle.
Development to FBP	The forecast can be updated with 2024/25 outturn.

Addition information

The annual and 3-year levels of leakage for the percentage change movements in Table 1 are set out. Figure 1 sets out the historic performance of the Zonal Leakage (MLE) in deficit zones. Figure 2 shows the forecast.

Zones in deficit	AR20	AR21	AR22	AR23	AR24	AR25
Annual average	239.68	239.28	238.96	235.87	233.54	[231.00]
Rolling average AR20-22	239.31					
Rolling average AR21-23		238.04				
Rolling average AR22-24			236.12			
Rolling average AR23-25				233.47		

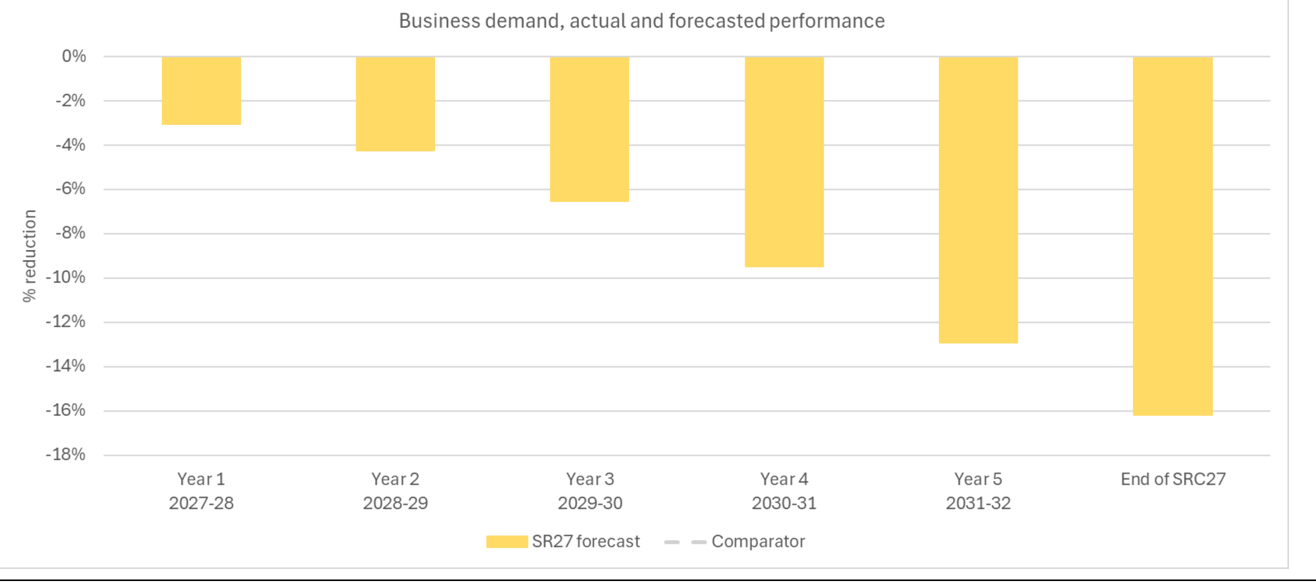
Figure 1 – Annual and 3 year rolling trends from AR20

Baseline YR

	YR4	YR5	YR6	YR1	YR2	YR3	YR4	YR5	YR6
	2024-2025	2025-2026	2026-2027	2027-2028	2028-2029	2029-2030	2030-2031	2031-2032	2032-2033
YR AV	231	230 -1	229 -1	226 -3	222 -4	217 -5	211 -6	204 -7	195 -9
3YR AV	*233*	*232*	*230*	228	226	222	217	211	203
% Reduction from Baseline	-	*-0.80%*	*-1.50%*	*-2.20%*	*-3.30%*	*-5.10%*	*-7.20%*	*-9.80%*	*-12.90%*
% Reduction in YR	-	*-0.80%*	*-0.70%*	-0.70%	-1.20%	-1.80%	-2.30%	-2.80%	-3.50%

Figure 2 – projection of %reduction of leakage in deficit zones from baseline year 2024/25

5.4 Consumption at non-household premises (Table 1 line 9)

Reference	Line reference 1.09 - Business demand - Percentage reduction of consumption at non-household premises* (%)
Definition	The percentage net reduction of three-year average measured business demand in mega-litres per day (Ml/d) from a 2024-25 baseline. Three-year average values are calculated from annual average values for the reporting year and two preceding years expressed in Ml/d. Non-household premises include businesses, charities and public sector organisations.
Plot	
Base figures	The three-year average business demand to 2024/25 is forecast to be 371.5 M//d (effectively latest forecast for row A2.10 in Annual Return) is 349.3Ml/day.

Basis of projection	The consumption at non-household premises is based on two parts: • A reduction in demand without smart metering following recent trends • A further reduction in demand with the roll out of smart metering. This is forecast to reach 135k meters by the end of SR27. The 3-year average reduction in demand is projected to reach 24 M//d by the end of SR27. The overall reduction on the 3-year average is 16.2% at the end of SR27.
Forecast commentary to SRC45	Assumed long term level is for a 21.9 % reduction relative to 16.2% at the end of SR27 from the full roll out of smart metering.
Range of confidence	D3: D as it is based on a set of assumptions that are not considered to be sufficiently reliable for target outcomes. The demand is influenced by the economy, and specific impacts on particular sectors. For example, the potential close of INEOS would lead to a step change in demand that SW has no control over. “3” as medium uncertainty as it is benchmarked to the impact of smart metering in England and is subject to further trials. The smart metering reduction is at risk and within the 0-10% range of uncertainty.
Scenarios	The outcomes for Scenarios A, B and C are assumed to be the same.
Target Suitability	It can be affected significantly by factors outside of SW’s control. It would be suitable for reporting of the impact of smart metering following analysis to eliminate some for the main factors that occur outside of SW’s control.
Target Type	The outcome percentage reduction is to be maximised.
Target	Most suitable to reporting with the aim of maximising the reduction from smart metering.
Financial assumptions and dependencies	This projection appears to differ from the main line in the Financial Model, which assumes a flat profile, as it makes specific assumptions around separate tariff adjustment as reported in finance tech appendix.
Operational assumptions	Assumes that the roll out of smart meters will be completed following study of final trial.
External assumptions	Dependent on the economy, non-household business opening and closing and licence provider retail pricing and commercial packages
Additional information	See the calculation below.
Development to FBP	The forecast can be updated with 2024/25 outturn with potential input from the outcome of trials.

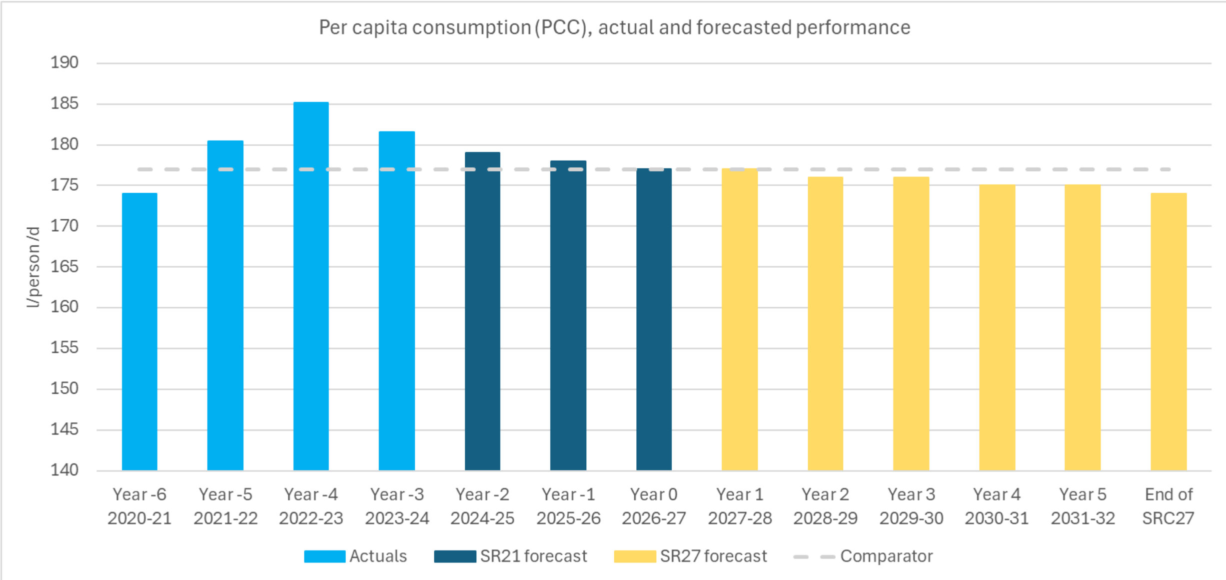
Additional information	The calculation is set out below.

			Baseline			SR27 Period					
	22/23	**23/24**	**24/25**	***25/26***	***26/27***	**27/28**	**28/29**	**29/30**	**30/31**	**31/32**	**32/33**
Percentage reduction of consumption at non-household premises*											
Year-on-year reduction (Finance model):				*0.35%*	*0.35%*	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Forecast in-year NHH Demand (Finance model):	378.1	372.3	364.2	*362.9*	*361.7*	356.2	350.9	345.6	340.4	335.3	330.3
3 year average:			371.5	366.5	362.9	360.3	356.3	350.9	345.6	340.5	335.4
						-3.0%	-4.1%	-5.5%	-7.0%	-8.4%	-9.7%
NHH demand reduction from Smart Metering (From St3a Appraisal)							1.5	9.3	17.1	24.2	30.6
Forecast in-year NHH Demand (Finance model + Smart Meters):				362.9	361.7	356.2	349.4	336.3	323.3	311.1	299.7
3 year average:			371.5	121.0	241.5	360.3	355.8	347.3	336.4	323.6	311.4
Percentage reduction of consumption at non-household premises*			-			-3.0%	-4.2%	-6.5%	-9.5%	-12.9%	-16.2%
Reduction of smart metering						0.0%	-0.1%	-1.0%	-2.7%	-5.0%	-7.2%

Material Uncertainty INEOS consume circa 30Ml/d and are in the process of decommissioning their activities at Grangemouth, with possible 15Ml/d reduction in demand in the next 2-3 year which is not accounted for in the forward projection due to the materiality of the associated uncertainty.

Notes: Currently 40% billed by volume 60% by rateable value. Therefore, change in NHH Demand would only affect the 40% billed by volume.

5.5 Three-year average per capita consumption (Table 1 line 10)

Reference	Line reference 1.10 - Per capita consumption (PCC) - Three-year average per capita consumption* (l/person /d)
Definition	The three-year average PCC in litres per person per day (l/person/d). Three-year average values are calculated using annual average per household consumption (PHC) values from unmeasured household use for the reporting year and two preceding years expressed in l/person/d. This will be based on calendar year to align with other elements of the annual water balance. Reporting will begin from January 2027.
Plot	
Base figures	The outturn 3-year average to 2023/24 is 182 l/p/d with a forecast 3-year average to 2024/25 forecast to be 179 l/p/d to form the base.

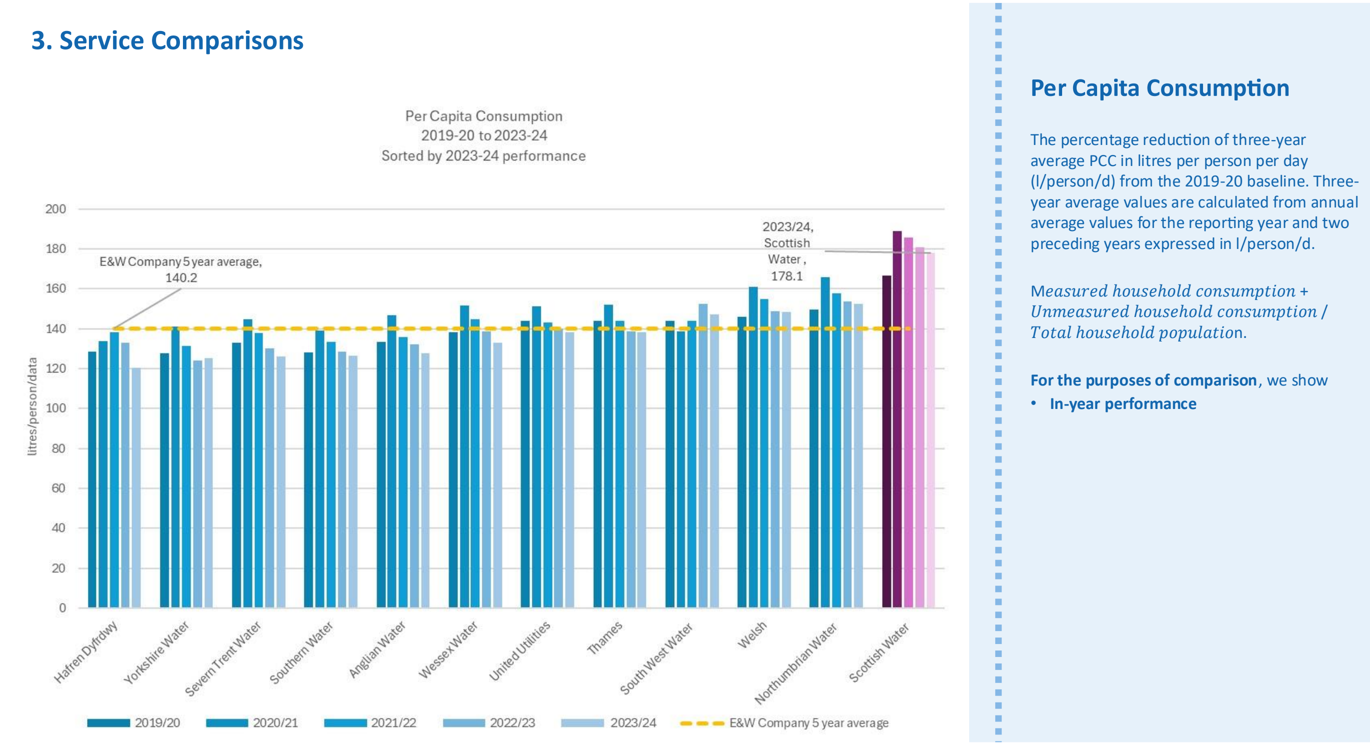
Basis of projection	The projected outcome to 2033 assumes that there will be some reduction in hybrid working but it does not return to pre-covid level of 167 l/p/d. Customer awareness will impact short term during dry weather – small sustained improvements may be delivered in pockets. The forecast is for the 3-year average to reduce to 177 l/p/d by the end of SR21 and 174 l/p/d by the end of SR27.
Forecast commentary to SRC45	The long-term forecast assumes that the metric will reach the current average level currently experienced in E&W.
Range of confidence for SRC27 period	C2 It is not yet within current performance monitoring and would need to have investment to alter its path. Its central estimate has a low because there is not expected to be material change during SR27. “C” the projection is based on historic performance. “2” there is considerable variation as it shows gradual movement since the year of 2020/21.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for Scenario A on the basis that the expected investments in the same.
Target Suitability	The metric is dependent on customer behaviour, such as return to office or Scottish Government initiatives on the labelling of white goods, that is largely outside of SW’s direct control. It is not suitable in isolation for a target outcome because it is dependent on many factors outside of SW control with only some indirect influences that SW can use to encourage changes in customer behaviour.
Target	It is proposed that this metric is included within an Awareness measure that is in development
Financial assumptions and dependencies	There is no investment currently in SRC27 to influence this metric. The preferred long term approach is to improve the metric through monitoring and other means.
Operational assumptions	There are opportunities to influence customer attitudes towards water use. Hybrid working reduces but does not go back to pre-covid levels of 167l/p/d
External assumptions	Scottish Government initiatives on the labelling of white goods might lead to further reductions in this metric over time. White good labelling could take a decade for any impact.
Additional information	The comparison with E&W shows a relatively high PCC in Scotland. The long term strategy sets our long term aim to reduce PCC (see below)
Development to FBP	Our proposal is to develop this measure for trial by the Final Determination with a view to it being introduced more formally as a measure during SRC27.
Additional notes:	

The household Per Capita Consumption (PCC) is an estimate derived from a small area monitor which measures average water use, per household. The small area monitor consists of c.140 separate per household consumption (PHC) zones and includes c.10,000 properties in total. The monitor provides a representative sample of household water use, across different socio-economic categories. This is part of the water balance and water leakage calculations which align to the methodologies in E&W. It therefore relates to management approaches within Water Demand management for leakage and supply demand balance.

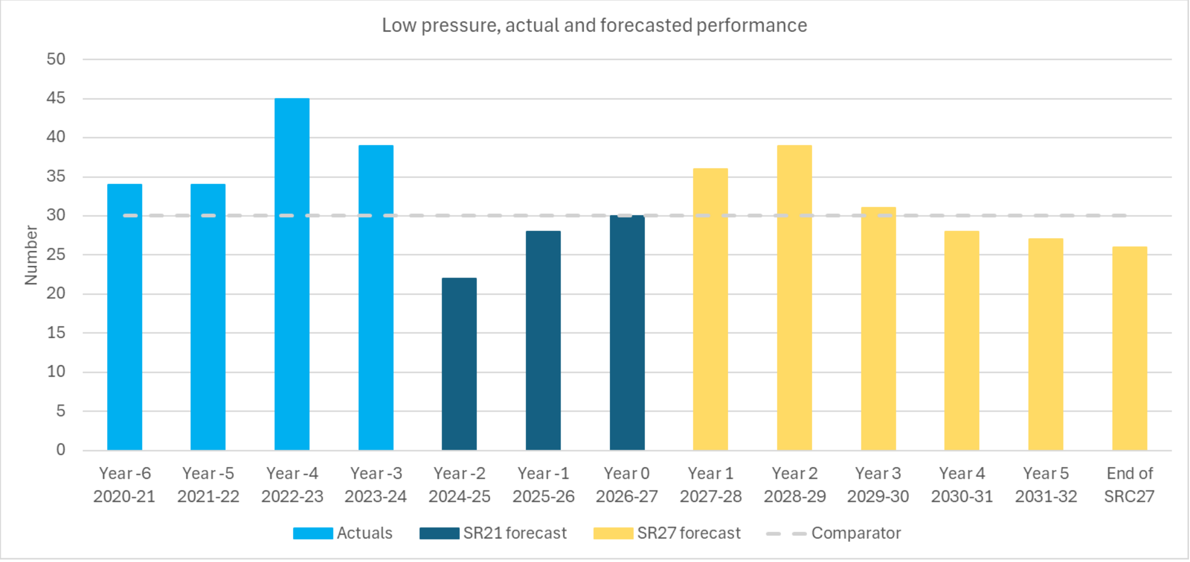
PCC has been in the range of 165 to 190 litres per person per day (l/p/d) in the last 5 years and was 178.1 l/p/d in 2023/24. The historic trend before Covid was a gradual rise. This included a change in methodology in night demand which had the effect of transferring non-household use to household use in AR19. Covid stepped up the PCC and there is a lag effect to reduce PCC since Covid as people return to previous water using patterns. This is shown in the table below and used to form the 3-year average.

AR13	AR14	AR15	AR16	AR17	AR18	AR19	AR20	AR21	AR22	AR23	AR24
2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
148.82	149.99	148.94	154.06	150.57	152.83	166.55	166.53	188.93	185.83	180.72	178.09

The comparative figure for E&W as 140.2 l/p/d. The current SW level is 178; the current E&W is 140.

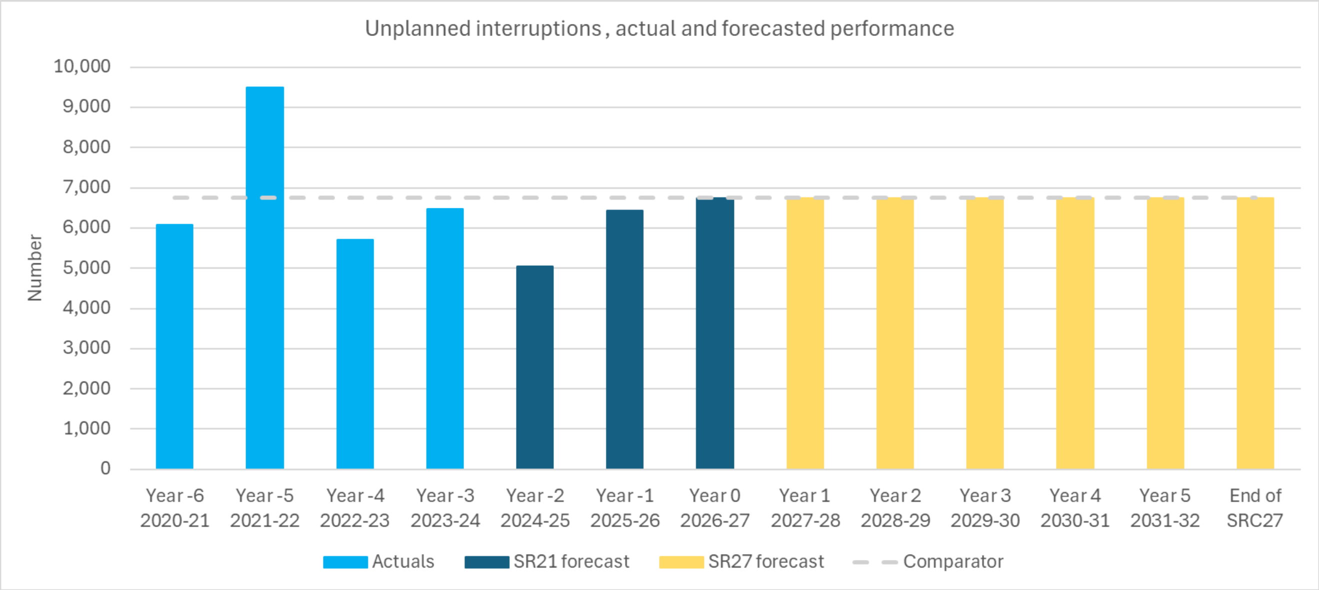


5.6 Properties on the low-pressure register (Table 1 line 11)

Reference	Line reference 1.11 - Customers receiving low pressure - Number of properties on the low-pressure register (Number)
Definition	The total number of properties on the low pressure register at the end of the year.
Plot	
Base figures	The outturn for 2023/24 is 39. The 2024/25 and 2025/26 forecasts for 22 and 28 and forms the baseline.
Basis of projection	Projections and based on historic run rate and rate at which properties are removed during the investment period. It is assumed that based on historic trends that on average 6 properties will be added to the register each year. The forecast is 30 for the end of SR21 which is the average of the last two outturn years (to 2024/25) and based on the investment profile of removals. In SR27 the register increases to 39 (year 2) before reducing to 26 by the end of SR27 based on the investment profile of removals. It assumes 35 additions and 37 removals plus a further 3 removals from Hattonrigg.
Forecast commentary to SRC45	The projections are based on the Long-Term Investment Strategy and Strategic Cost Benefit Analysis.

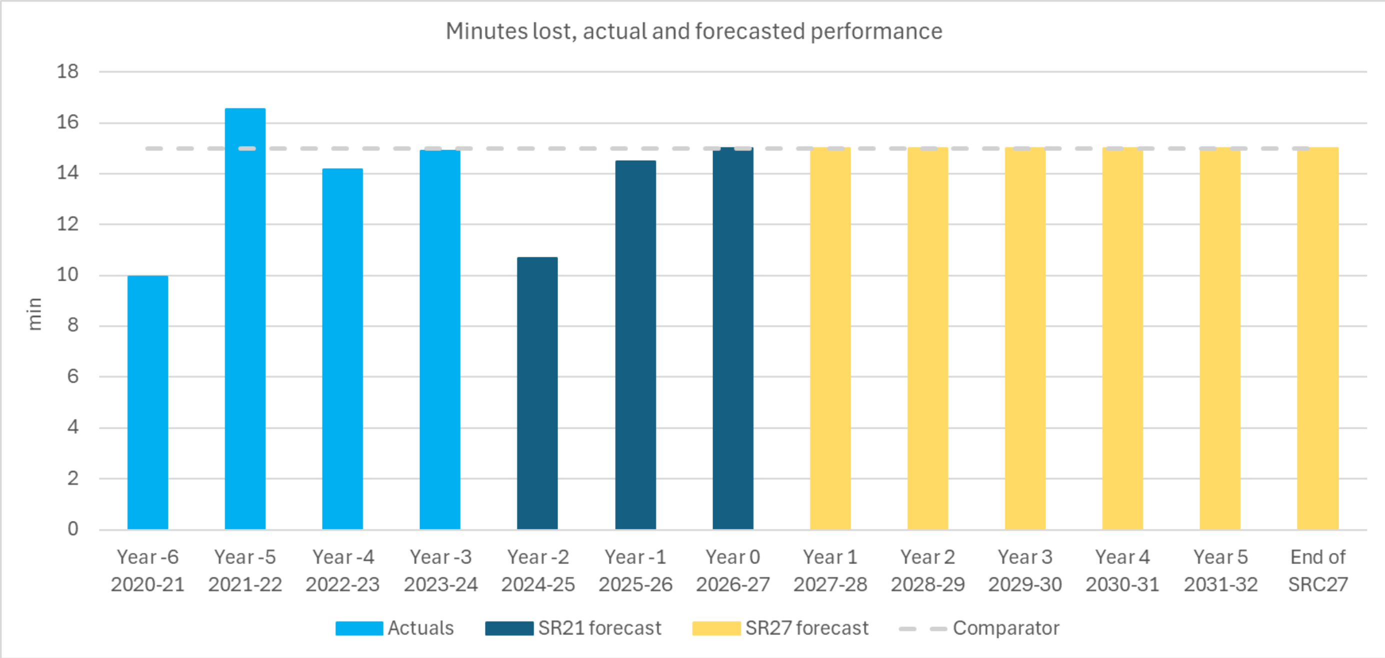
Range of confidence	B3 "B"- at this is largely based on historic trend analysis, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. "3" is a medium level of uncertainty. The average of the 4 years to 2023/24 is 41 in a range of 34 to 45 which indicates a margin of variation or error of about 10%.
Scenarios	All scenarios have the same forecast outcome as there is no change to the investment.
Target Suitability	The target is suitable and used in OPA
Target Type	The outcome is to be minimised.
Target	26 properties at the end of SRC27.
Financial assumptions and dependencies	Assumes most remaining low-pressure properties are targeting single properties which require discrete solutions – most likely booster pumps and it will be feasible and cost effective to remove properties from the low-pressure register.
Operational assumptions	Assumes the network is operating as it should when properties are benchmarked through pressure logging to assess if they meet the criteria to be added to the register.
External assumptions	Assumes when properties are benchmarked that there are no third party or external factors impacting on the level of service the customer receives
Other assumptions	Assumes properties in the vicinity of a low-pressure property may also experience low pressure. However, these properties will not be added unless these customer phone in and complain.
Additional information	There is no additional information.
Development to FBP	The forecast can be updated with 2024/25 outturn.

5.7 Unplanned interruptions greater than 6 hours (Table 1 line 12)

Reference	Line reference 1.12 - Unplanned interruptions - Unplanned interruptions greater than 6 hours, excluding 3rd party (Number)
Definition	The number of properties that have experienced an unplanned water supply interruption. The calculation uses the number of properties affected by interruptions lasting between 6 and 12 hours, between 12 and 24 hours, and over 24 hours, with respective weightings of 1, 2 and 4. There are no exclusions, except for Third Party events, and includes weather-related and health and safety concern incidents. In contrast to OPA this metric is not divided by the number of connected properties.
Plot	
Base figures	The 2023/24 outturn is 6,481 properties and the forecast for 2024/25 is 5,047 from a mild weather year. The forecast for 2025/26 is close to that of 2023/24 at 6,443 and forms the base year forecast for the projection.

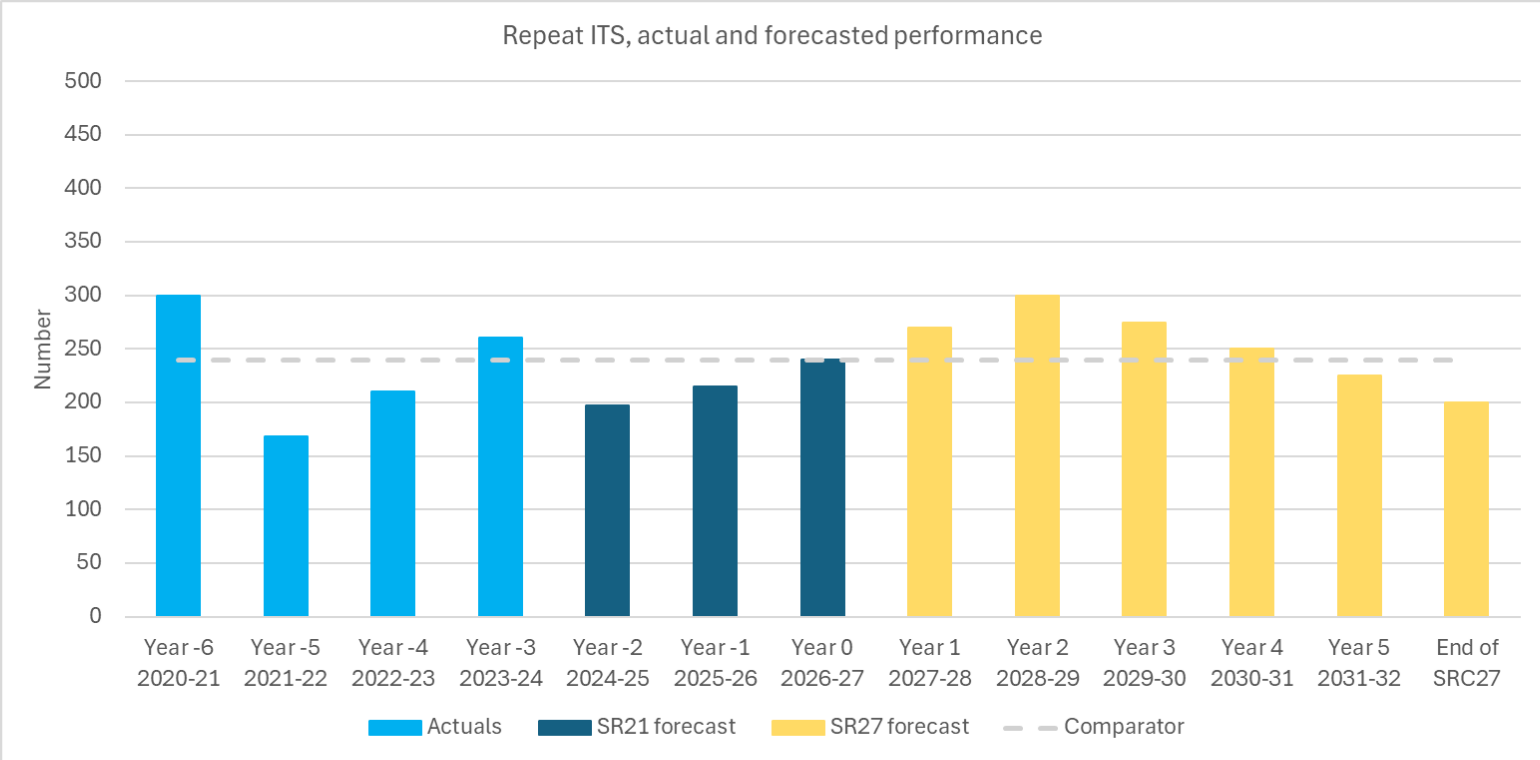
Basis of projection	The 4-year average to 2023/24 is 6,946 and is rounded to 7000 to form the annual forecast through SR27. The forecast to the end of SR21 is forecast to step up towards 6,750 by the end of SR21. The burst frequency per 1000km is forecast to increase from 165 at SR15 to c200 as we enter SR27. Our SR27 mains rehabilitation programme is planned to reduce the number of bursts on our network however with the effects of climate change on our below ground assets increasing burst numbers further, the impact of our programme is forecast to maintain our SR27 entry position at the end of the period. The 4-year average to 2023/24 is 6,946 and is rounded 6,750 to form the annual forecast through SR27 with tier 1 expenditure and initial mains renewals.
Forecast commentary to SRC45	In the long term the outcome level assumes we can reduce this metric to 5,000 from the mains renewal, further aging of assets and climate change.
Range of confidence	B3 “B”- at this is largely based on burst rate models, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. “3” is a medium level of uncertainty.
Scenarios	The outcomes for Scenarios A and B are the same. The outcome for Scenario C has a 10% increase in households affected at 7,425 at the end of SR27.
Target Suitability	This is suitable and a form of it is used within the current OPA
Target Type	The outcome is to be minimised
Target	6,750
Financial assumptions and dependencies	Assumes capital investment stepping up in SR27 particularly in asbestos cement rehab/replacement, with subsequent reduction in ITS in future investment periods
Operational assumptions	Increased meter monitors across our network to enhance our response and recovery
Additional information	Climate change adaptation has and could have a big impact on this indicator
Development to FBP	Further consideration of the change in metric definition relative to the current OPA.

5.8 Average minutes lost (Table 1 line 13)

Reference	Line reference 1.13 - Planned and unplanned interruptions - Average minutes lost due to water supply interruptions (over 3 hours) * (min)
Definition	Average supply interruption greater than three hours (minutes per property) as reported in AR24 B2.25. The average number of minutes lost per customer for the whole customer base for interruptions that lasted three hours or more. Output should be presented as average minutes lost. Calculation of performance is carried out using the following equation: $((Properties\ with\ interrupted\ supply \geq 180\ mins) \times Full\ duration\ of\ interruption)$ $Total\ number\ of\ properties\ supplied\ (year\ end)$ = average number of minutes lost per customer. Note that this includes planned and unplanned ITS, and third party ITS.
Plot	
Base figures	The 3-year average to 2023/24 is 15. The current annual forecast for 2024/25 is 10.7 due to a mild year.

Basis of projection	The forecast provided is based on increasing burst frequency per 1000km increasing from 165 at SR15 to forecasting c200 as we enter SR27, this coupled with further deterioration particularly on our asbestos cement (AC) network pushes our operational response particularly in rural locations. The forecast for the end of SR21 is 15 and the forecast for the end of SR27 is the same, maintained by tier 1 expenditure and initial mains renewal.
Forecast commentary to SRC45	In the long term, the outcome is projected to be 14.5, 14.0 and 13.0 respectively at the end of the subsequent regulatory periods with continued mains renewal.
Range of confidence	D3:- “D” as there has been no analysis of the impact of investment of this metric because the focus has been on developing the ITS repeats metric. “3” is medium uncertainty as estimate has started to settle.
Scenarios	The outcomes for Scenarios A and B are the same. The outcome for Scenario C is for a deterioration to 16.5 with reduced mains renewal.
Target Suitability	It is suggested that this is not targeted to focus progress in ITS repeats. While it could be used as a target outcome, repeat or recurring interruptions is a metric that is better aligned to where customer’s most value improvement and would be a more effective measure of performance.
Target Type	The outcome is to be minimised.
Target	Reporting outcome rather than target outcome to align to the focus on reducing repeat interruptions.
Financial assumptions and dependencies	Assumes capital investment stepping up in SR27 particularly in asbestos cement rehab/replacement, with subsequent reduction in ITS in future investment periods.
Operational assumptions	Increased metering across our network to enhance our response and recovery.
Additional information	Climate change adaptation has and could have a major impact on this indicator.
Development to FBP	The forecast can be updated with 2024/25 outturn.

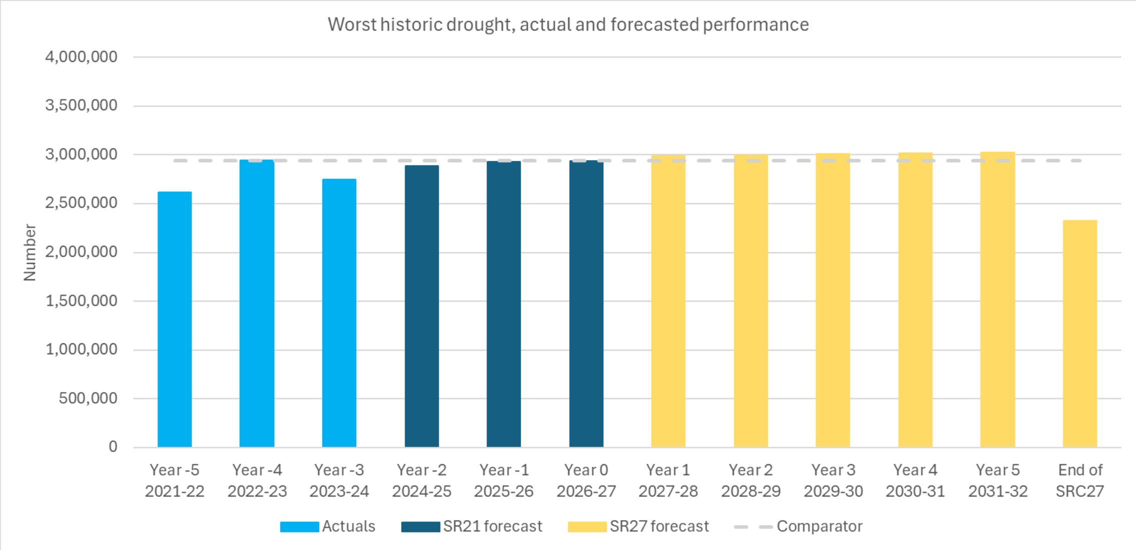
5.9 Repeat ITS (Table 1 line 14)

Reference	Line reference 1.14 – Repeat interruptions to water supply
Definition	The number of postcodes with repeat contacts of either • ≥ 6 property contacts within 1 year • ≥ 10 property contacts within 3 years. This equates to a given postcode reaching at least threshold level 4 (See additional information below).
Plot	
Base figures	The annual 2023/24 and 2024/25 outturns are 261 and 197.
Basis of projection	The projection to the end of SR21 has a rising trend from increasing burst rates. This figure is forecast to increase to 300 in the early part of SR27 until the mains rehabilitation programme takes effect to bring it back down to 200 by the end of the period.

	The plan includes 300km of main replacement per year in SR27. Recurring interruption (RCI) schemes will make up a proportion of the length depending on delivery capacity and the remainder will be delivered to maintain the current burst rate (160 per 1000km per year). SR21 forecast based on the assumption 30 new postcodes will be added each year minus the number of postcodes which will be removed from planned projects based on a security of supply assessment.
Forecast commentary to SRC45	The number of repeat ITS is forecast to reduce to about 30% of its current level in the long term. The long term forecast improvement is greater than for the average minutes lost measure because the repeat ITS aligns with our Long Term Strategy and better than the above 6 hours interruptions metric because this metric has reached primarily a churn state after several regulatory periods as the target measure for interruptions to supply in Scottish Water.
Range of confidence for SRC27 period	The forecast is C4. "C" based on the method used is extrapolation, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. "4" is a high level of uncertainty. The range of values is 168 to 261 around the 3-year average outturn of 213. This indicates a margin of error of around 20%
Scenarios	The outcome for Scenarios A and B is the same and that for Scenario C is more limited to 240 at the end of SR27.
Target Suitability	It might be suitable for a target outcome if there is a way to reduce its variability, for example, through a 3-year rolling average.
Target Type	It is a reportable outcome to be minimised
Target	Potential target outcome.
Financial assumptions and dependencies	This outcome is dependent on the investment for mains rehabilitation. The profile assumes 2-years from scheme commencement to it having an impact.
Operational assumptions	The outcome is strongly influenced by customer contacts and therefore weather patterns and their effect on interruptions to supply.
Additional information	Although service is restored shortly after a failure occurs, some customers can experience repeat events resulting in recurring interruptions to supply when there are multiple failures on the same water main over a period. A new metric "repeat ITS" will track these recurring interruptions for a more granular view of interruptions to supply issues for customers. The business currently measures this through the management approach "MA001 - Recurring Customer Interruption" (RCI). Current RCI investment decision criteria stipulate that an RCI is recorded if either of the following two conditions are met: ≥ 6 property contacts within 1 year ≥ 10 property contacts within 3 years. There are threshold levels 1 to 8 (1 being the highest) which correspond to the max number of contacts per property in a particular postcode. Both these conditions reach at least level 4. This means that a case for escalation is made to warrant investment as per the management approach. Any escalated interruptions out with this policy are reviewed on a case-by-case

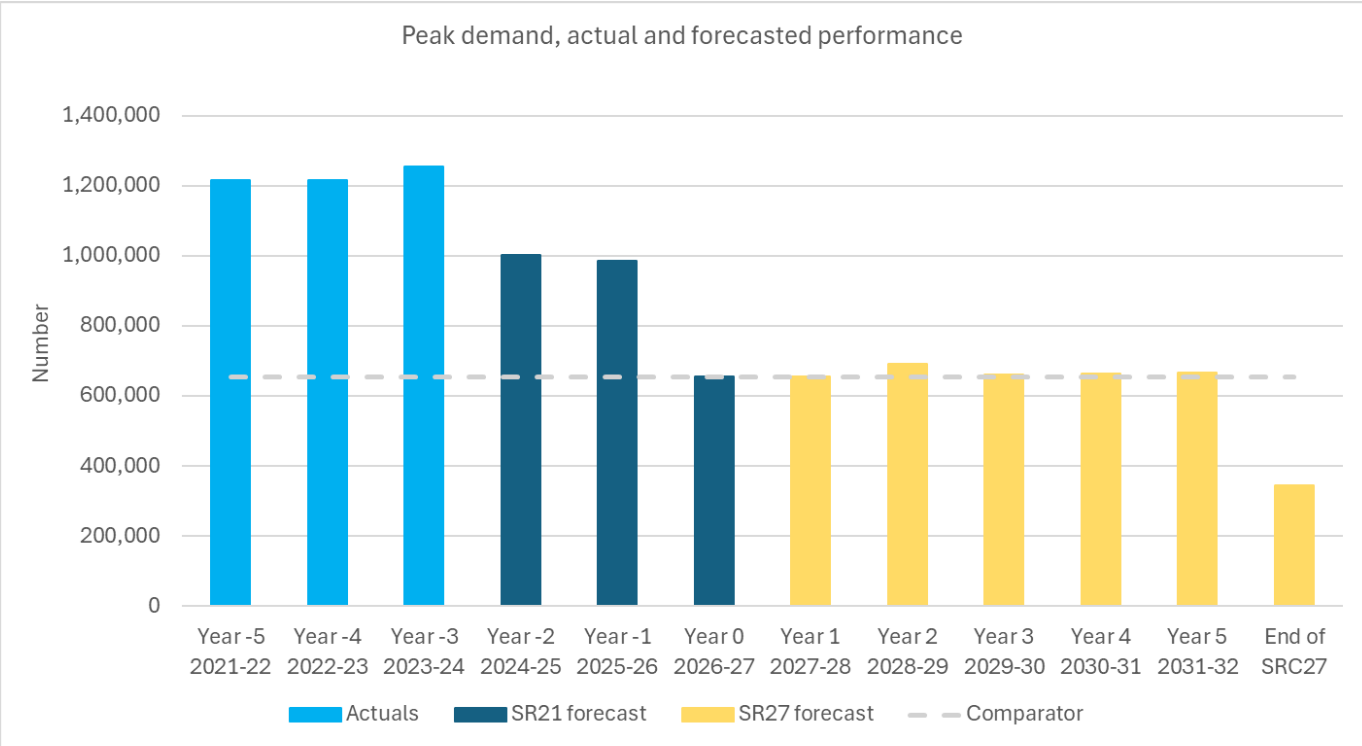
	basis by senior management regarding decision on whether they are a priority for investment and to allow us to meet the customer needs. AC mains service life is not affected by this.
Development to FBP	Further consideration of the means to reduce the outcome variability.

5.10 Worst historic drought (Table 1 line 15)

Reference	Line reference 1.15 - Water availability - Customers supplied by systems not capable of meeting demand during a worst historic drought (Number)
Definition	Population of customers supplied by systems not capable of meeting demand during a worst historic drought. The definition includes: • Worst Historic Drought (assumed 1:150) • Climate change adjustments would be made in line with climate adaptation plan. • The use of documented drought measures.
Plot	
Base figures	2023/24 Annual return figure of the population of Table 9f but for hydrological yield only and with a climate change adjustment.
Basis of projection	The model estimates, for each Water Resource Zone (WRZ), the “Dry Year Headroom” less “Target Headroom” to form a deficit and then sums the populations served in the deficit sones. The model uses many inputs to form estimates for these two variables and inform the planning response in each WRZ. Supply Demand Balance (SDB) forecast population of deficit zones in the DYC Scenario.
Forecast commentary to SRC45	The long term forecast outcome is for a reduction to 1.50 million, 0.75 million and 0.20 million in subsequent regulatory periods with investment.

Range of confidence	D4: The source of information indicates the available definition and forecast to-date is not reliable and would not be suitable for a target outcome. While the SOSI model is well developed the forecasts for climate change will need further review of the Water Available for Use variable (WAFU). "4". The projected change is over 20% and has a very high uncertainty at the time of the FBP.
Scenarios	Scenarios B and C are assumed to be the same as Scenario A.
Target Suitability	The model estimates, for each Water Resource Zone (WRZ), the "Dry Year Headroom" less "Target Headroom" to form a deficit and then sums the populations served in the deficit sones. The model uses many inputs to form estimates for these two variables and inform the planning response in each WRZ. The model is more a tool to inform planning under different scenarios and analyse the nuances of each WRZ, and less a measure of performance. As such it is more suitable for reporting once developed.
Target Type	It could be a reportable outcome. It will need further testing before it can be considered for anything beyond a reporting outcome.
Target	The outcome is to be maximised.
Financial assumptions and dependencies	The outcome improvement arises from planned investments in Dundee and Lanarkshire (Burnside) in period and further investment in Fife and Edinburgh by 2032/33. Assumes the SR27 investment cost assumptions and leakage reduction outcomes for deficit zones.
Operational assumptions	Projection assumes that operational response of Drought Plan actions would continue to be utilised to maintain service levels for Water Continuity.
External assumptions	Customer behaviours linked to environmental and economic circumstances principally control the majority of the reported demand components used in the SDB. The extent of these factors increases for the future forecast due to additional uncertainty about growth.
Other assumptions	The projection is subject to all the Supply Demand Balance assumptions currently used in the existing B9 tables reporting. Additionally, there are forecast elements that are not currently part of the B9 tables, which include Climate Change, Growth, and a cross-dependency on other investment activities that can impact on the demand forecast, such as Leakage and Water Efficiency measures. Other dependencies may include changes to operational supply assets resulting from other investment programmes, notably Water Quality changes to WTW processes and the corresponding influence on Raw water efficiency.
Additional information	Note that Drought measures and water use restrictions are not currently accounted for in the Supply Demand Balance. Methodology or planning assumptions to handle these instances need to be developed, as they're not integrated into the modelling of hydrological yield.
Development to FBP	Further consideration will be given to definition options and forecasts.

5.11 Peak demand (Table 1 line 16)

Reference	Line reference 1.16 - Water availability - Customers supplied by systems not capable of meeting peak demand (Number)
Definition	Population of customers supplied by systems not capable of meeting peak demand. The definition is based on: • peak period against WTW capacity and CAR licence (both summer and winter) • not considered peak network constraints • allows for Scottish Water tankering policy.
Special note	The base and forecast figures provided in Table 1 are **very provisional** and likely to change with further development for the FBP. See Development for FBP below.
Plot	
Base figures	2023/24 Annual Return figure from Table 9 but for WTWs and CAR only and with a climate change adjustment.

Basis of projection	The model estimates, for each Water Resource Zone (WRZ), the “Dry Year Headroom” less “Target Headroom” to form a deficit and then sums the populations served in the deficit sones. The model uses many inputs to form estimates for these two variables and inform the planning response in each WRZ. Supply Demand Balance (SDB) forecast population of deficit zones in the DYC Scenario. It assesses the capability to meet demand only through WTW and CAR and their supply constraints.
Forecast commentary to SRC45	The long term forecast outcome is a for reduction to 0.25 million, 0.15 million and 0.05 million in subsequent regulatory periods with investment.
Range of confidence	D5: “D” The source of information indicates the available definition and forecast to-date is not reliable and would not be suitable for a target outcome. While the SOSI model is well developed the forecasts for climate change will need further review of the Water Available for Use variable (WAFU). “5”. The projected change is over 25% and has a very high uncertainty at the time of the FBP.
Scenarios	Scenarios B and C are assumed to the same as Scenario A
Target Suitability	The model estimates, for each Water Resource Zone (WRZ), the “Dry Year Headroom” less “Target Headroom” to form a deficit and then sums the populations served in the deficit sones. The model uses many inputs to form estimates for these two variables and inform the planning response in each WRZ. The model is more a tool to inform planning under different scenarios and analyse the nuances of each WRZ, and less a measure of performance. It had the potential to be developed for reporting
Target Type	It could be a reportable outcome. It will need further testing before it can be considered for anything beyond a reporting outcome.
Target	The outcome is to be minimised.
Financial assumptions and dependencies	SR27 investment cost assumptions and investment including Lanarkshire (Burnside).
Operational assumptions	Management of service provision at times of peak has a much greater reliance on operational response to supplement fixed asset capability; tankered transfers of water are one of the primary responses to short term insufficiency where appropriate and deployable. In larger supply systems, existing connectivity can be extended where possible to maintain services over shorter durations before returning to the average operational norm.
External assumptions	Our understanding of planned peak demands is based on historic demand data analysis and will reflect peak demands that have occurred relative to the recorded annual average. For any current year peak demand may exceed our planned volumes by exceptional or novel customer circumstances, setting new peaks that are not in the observed record. New demand data is always considered when reassessing future peaks demands, but we currently lack an ability to

	understand how peak demands may change in future as a response to broader socioeconomic or environmental factors such as tourism trends or climate change.
Other assumptions	The projection is an extension to the SDB assumptions currently used in the existing B9 tables reporting. Additionally, there are numerous forecast elements that are not currently part of the B9 tables, which include Climate Change, Growth, and a cross-dependency on other investment activities that can impact on the demand forecast, such as Leakage and Water Efficiency measures. Other dependencies may include changes to operational supply assets resulting from other investment programmes.
Additional information	There is no additional information.
Development to FBP	Further consideration will be given to definition options and forecasts. These numbers are very provisional and like to change significantly. They are based on SDB peak deficits that don't account for resilience from network storage. Further work to do to focus on the acute pinch points, most likely from historic operational data, will be taken forward for the FBP.

6 Water Quality

6.1 Summary

Performance measures
The measures of Total water quality compliance forms part of the current OPA and contacts of taste & odour and discoloration are included in hCEM. In contrast the following metrics are new:

- DWQR reported incidents
- water risk assessment planning measure
- lead in the SW network
- lead in customer pipes.

Comparator metrics
The WICS Guidance identifies metrics as offering the potential for benchmarking with England & Wales including:

- taste & odour contacts
- discoloration contacts.

We also include a comparison of water quality compliance at the treatment works, service reservoir and tap

Our Business Plan is to drive improvement where is it of most value to our customers, which is in drinking water quality and lead removal in the SW network.

Excluded measures
Outcomes are forecast for all the metrics within those listed by WICS.

Scottish Government Water Sector Principles
All of these metrics relate to Principle 2 which is as follows:

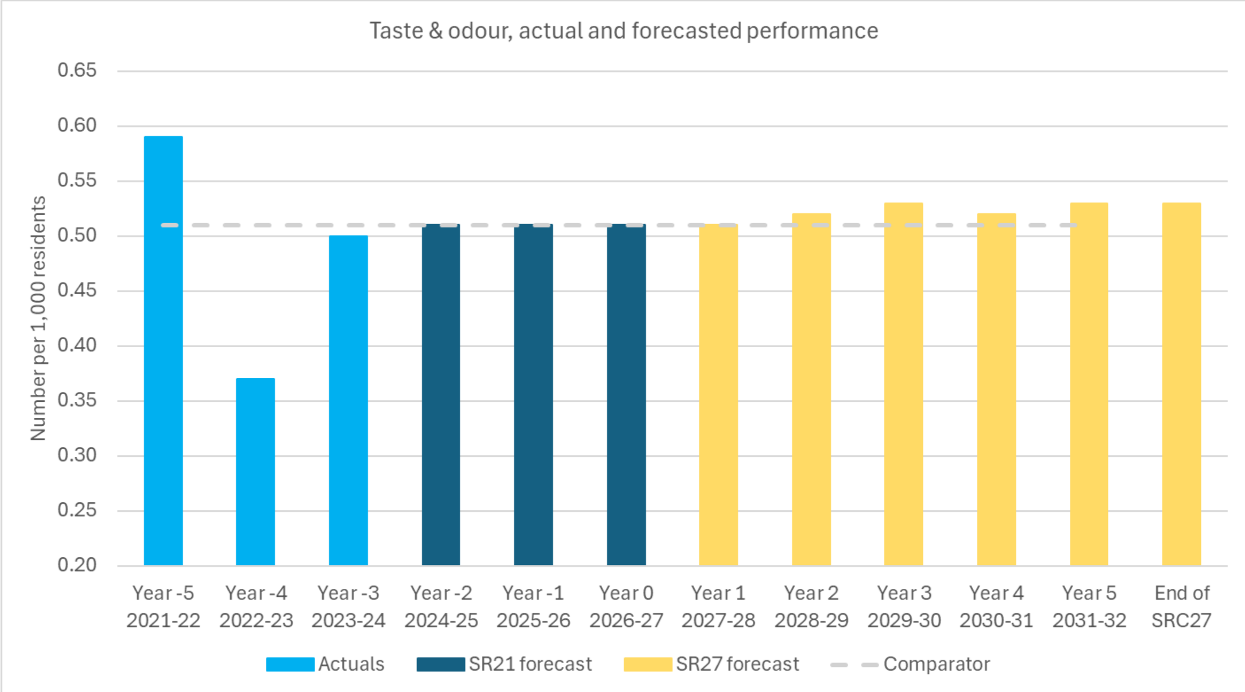
Safe drinking water is important to our health. We need to make sure that we are able to provide a reliable supply of water during dry periods and act to protect the water supplies quickly during these times. We also need to make sure that the water that reaches our taps remains safe to drink, which requires us to consider all the possible risks.

National Performance Framework
The main national Performance Framework outcome categories covered by these metrics are:

- Health – Health and Active
- Economy – A strong competitive economy.

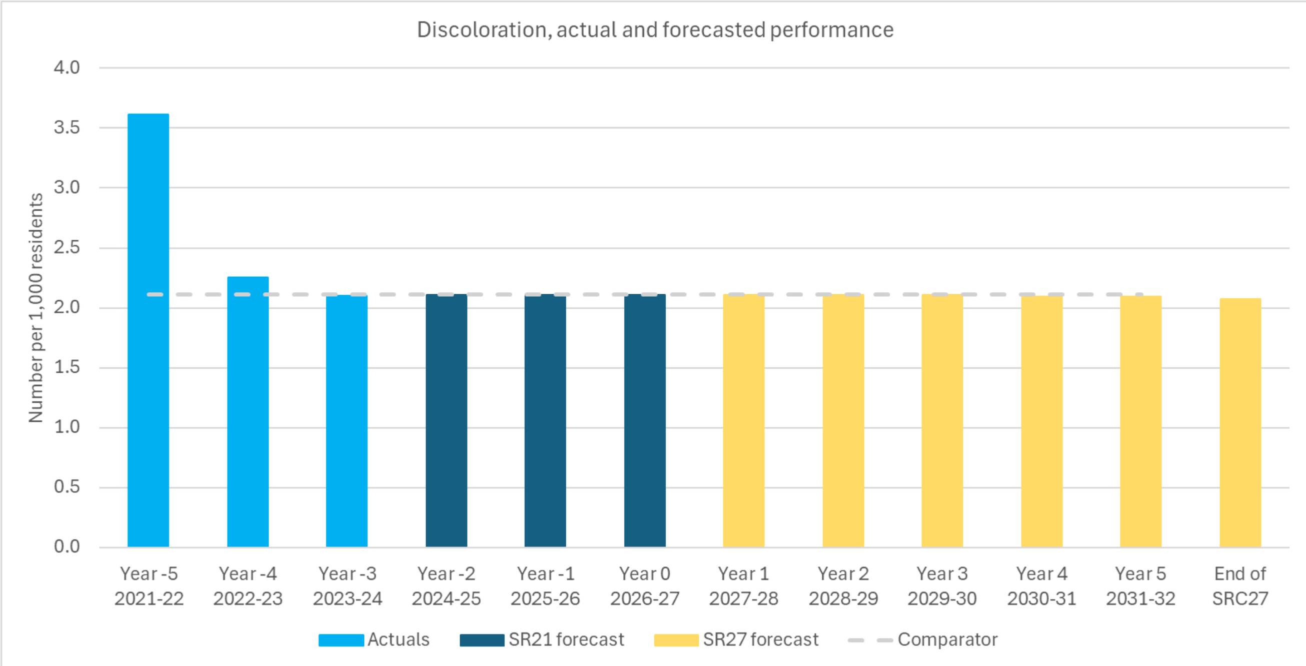
Development for Final Business Plan
The process for accrediting and reporting WRAP and DWQR reported incidents will need further development for the FBP.

6.2 Taste and odour (Table 1 line 17)

Reference	Line reference 1.17 – Taste and odour contacts
Definition	The number of times customers contact the company due to the taste and odour of drinking water reported per 1,000 population. The calculation is the number of contacts for all taste, and odour contacts as reported to the Drinking Water Quality Regulator (DWQR) multiplied by 1,000 divided by the resident population. The measure is reported based on the calendar year.
Plot	
Base figures	The outturn for 2024 is 0.51, based on around 2,700 contacts.
Basis of projection	The forecast is that this figure is maintained through to the end of SR21. The forecast is for this level of service to move to 0.53 by the end of SR27 (2026) due to greater issues with earthy/musty water.
Forecast commentary to SRC45	Taste & odour contacts are forecast to reduce to 0.30 of their current level with further GAC investment to address algae and musty taste & odour upward pressures form climate change.

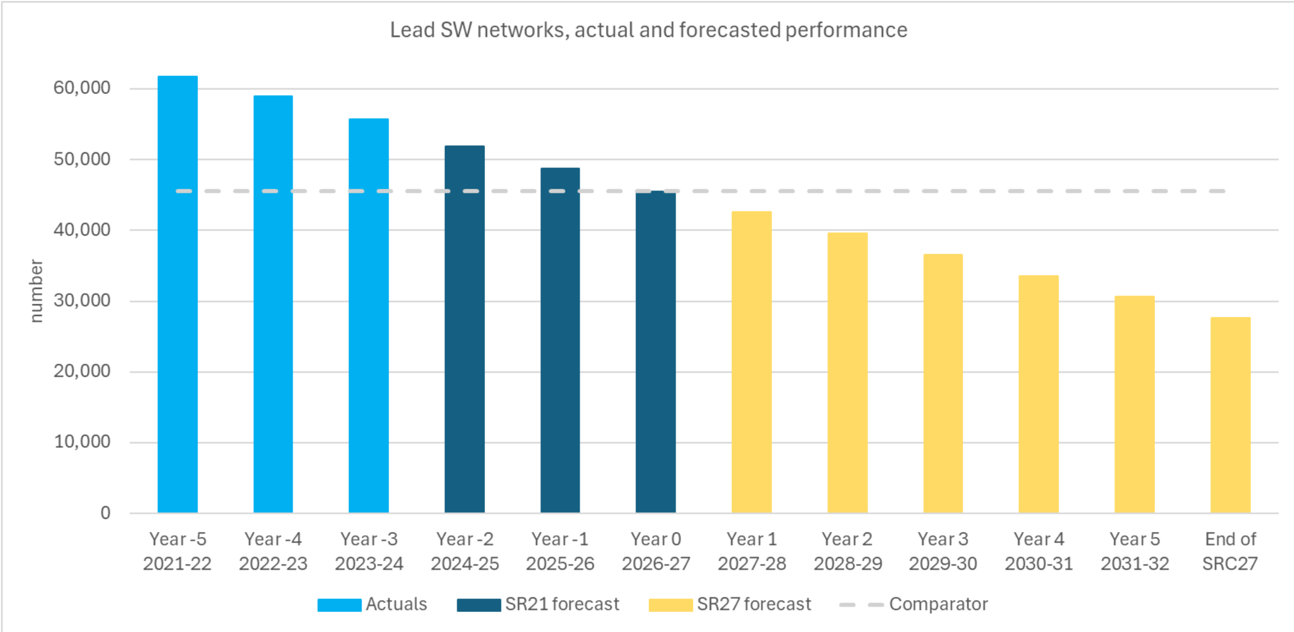
Range of confidence	B4 “B” through extrapolation and it forms part of well-established DWQR and hCEM reporting. “4” confidence. The average of the 3 years to 2024 is 0.46 with a range of 0.37 and 0.51 which indicates a margin of uncertainty or error of 20% and hence “4”.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the expected investments in the same.
Target Suitability	It is already within Total Water Quality Compliance and household CEM.
Target Type	It is an outcome to be minimised
Target	The forecast is for a maintained service outcome.
Financial assumptions and dependencies	Carron Valley SR21 reduces numbers by 50% then Ozone by 2030 by 90%. (407 CV Earthy/Musty contacts in 2024).
Operational assumptions	Improvements to booster chlorination and DBP reductions chlorine related T&O by 10%. (720 Chlorine T&O in 2024)
External assumptions	Climate change and warming temperatures increases algae taste and odour risks across more sites, and this is factored into the long term investment.
Additional information	There is no further information.
Development to FBP	Consideration of whether it is an additional target outcome as it is already within Total Water Quality Compliance and household CEM.

6.3 Discolouration (Table 1 line 18)

Reference	Line reference 1.18 – Discolouration and aeration contacts
Definition	The number of times customers contact the company because the drinking water is not clear reported per 1,000 population. The calculation is the number of contacts for all appearance contacts as reported to the Drinking Water Quality Regulator (DWQR) multiplied by 1,000 divided by the resident population. The measure is reported based on the calendar year
Plot	
Base figures	The outturn for 2024 is 2.11, based on around 11,500 contacts pa.
Basis of projection	The forecast is that this figure is maintained through to the end of SR21 and through to mid SR27 at 2.11. The forecast is then for about 1.5% improvement to the end of SR27 (2026) to 2.08.
Forecast commentary to SRC45	Discolouration contacts are forecast to reduce to about 35% of the current level in the long term.

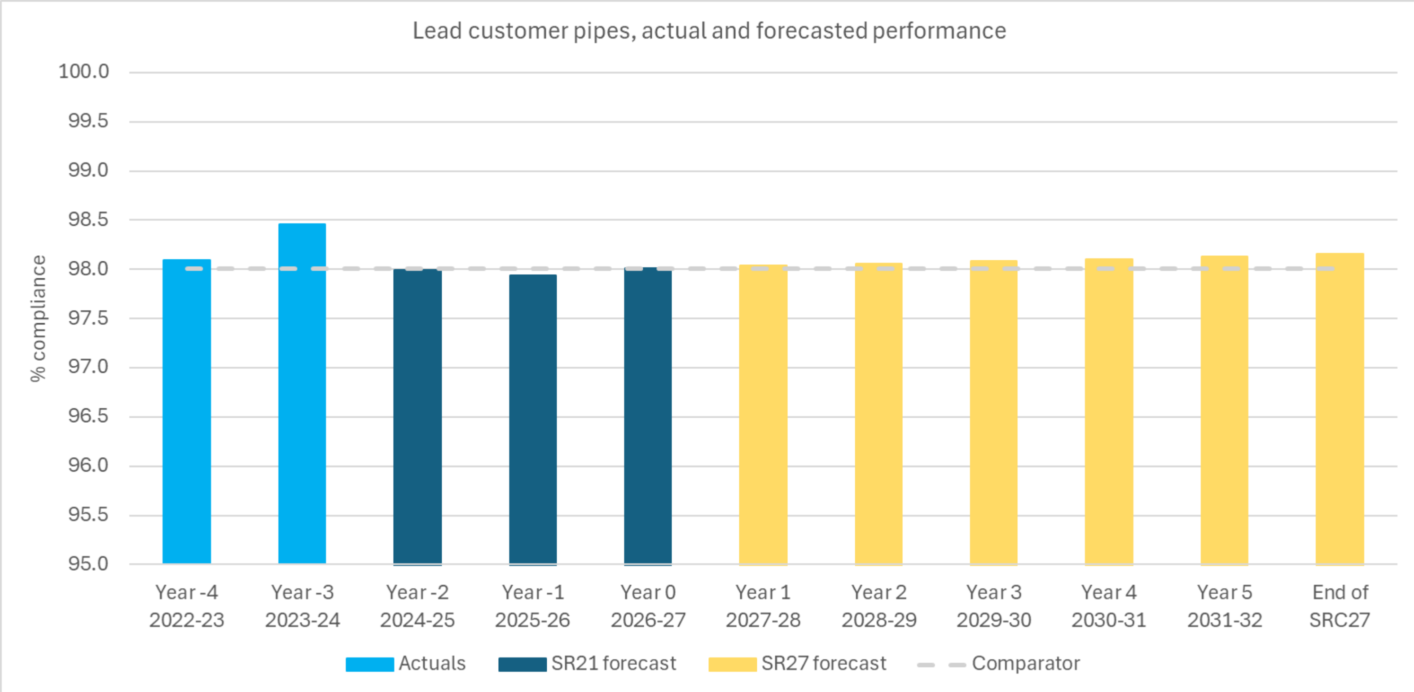
Range of confidence for SRC27 period	B3 "B" through extrapolation which forms part of well-established DWQR and hCEM reporting. "3" confidence. The average 3 years to 2024 is 2.16 with a range of 2.10 to 2.25 which has a margin of error of 5%. However, the uncertainty is increased to 5-10% because increased reservoir drawdown results in more Manganese passing WTW which is expected to lead to more volatile performance and contacts that are weather dependent.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the expected investments in the same.
Target Suitability	it is already within Total Water Quality Compliance and household CEM.
Target Type	It is an outcome to be minimised
Target	The forecast is for a maintained service outcome.
Financial assumptions and dependencies	Cleaning and conditioning programme maintains current levels. HAA / DBP improvements at Carron Valley, Winterhope, Black Esk and Winterhope reduce contacts by 10%. Glendevon & Camphill WTW organics removal improvements end of period.
Operational assumptions	Increasing organics thickens biofilms to form more discoloration with upward pressure on contacts.
External assumptions	Increased reservoir drawdown results in more Manganese passing WTW which is expected to lead to more volatile performance and contacts that are weather dependent.
Additional information	There is no further information
Development to FBP	Consideration of whether it is an additional target outcome as it is already within Total Water Quality Compliance and household CEM.

6.4 Lead in public network (Table 1 line 19)

Reference	Line reference 1.19 - Drinking water quality - Estimated number of lead pipes remaining in public network (Number)
Definition	Estimated number of communication lead pipes remaining in public network.
Plot	
Base figures	Number of estimated lead pipes is derived from the 2012 statistical survey which determined an average Lead comms pipe distribution of 4%, this equated to 72,000 comms pipes. Number of remaining Lead comms pipes has been calculated by subtracting the data reported in the WICS annual return from the 72,000 reported in 2012. In 2023/24 the estimate was 56,663 communication lead pipes remaining.
Basis of projection	The forecast is based on an average replacement rate lead pipe removals per year through the period based on a risk model. The forecast for the end of SR21 is 45,500 which is a removal rate marginally above 3300 pa. the average run rate for the full SR21 period is forecast ot be around 2800 pa. The forecast for the end of SR27 is 27,550 which is a removal rate of 3000 pa.

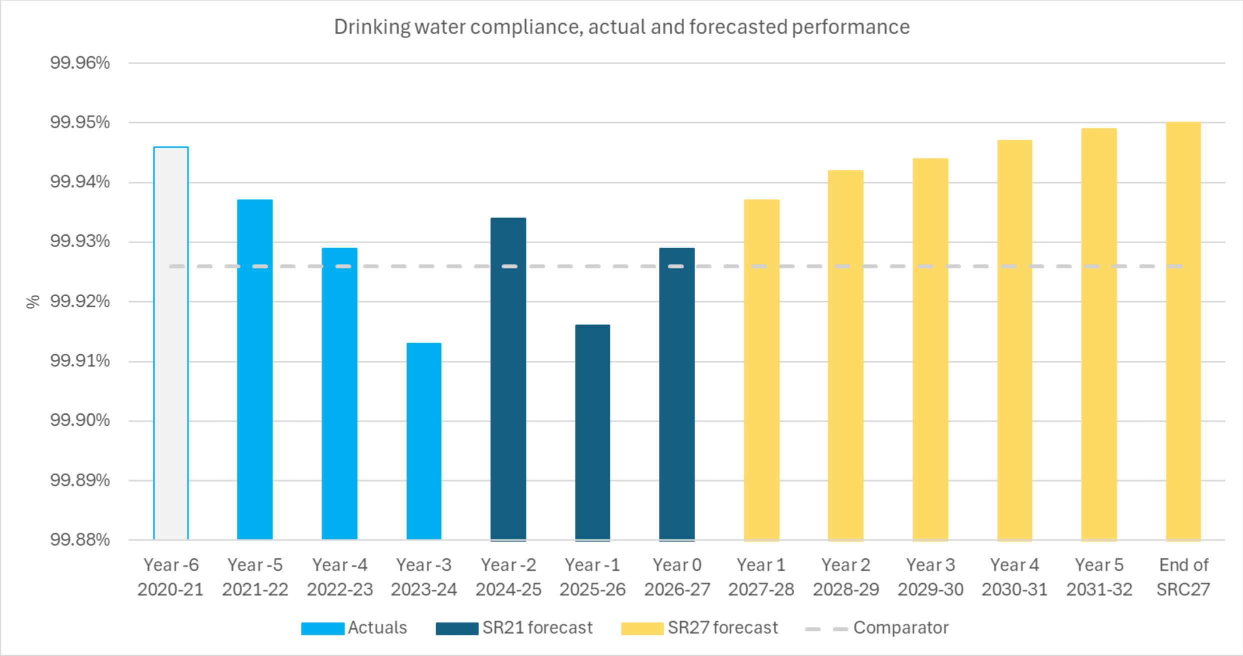
Forecast commentary to SRC45	The forecast projects from the end of SR27 based on the long-term investment plan out to 2051, at a maintained rate of 3000 pa would reduce the remaining communication lead pipes to 9,600 at the end of SR33 and then to zero in SR39.
Range of confidence for SRC27 period	C3. It is not yet within current performance monitoring and could developed further to become sufficiently reliable for target outcomes and currently its central estimate has a medium uncertainty. “C” extrapolation with confidence in initial 2012 statistical survey was +/- 10%. “3” confidence in reported replacements to WICS annual return is also +/- 10% with data accuracy improving with time through introduction of new data recording systems (Salesforce) and changes to the field recording procedure in 2022/23. The above figures also indicate a change in the average run rate of 200 pa in 2800 which is around 8%.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the expected investments in the same.
Target Suitability	Replacements can be a target outcome if there were no rebasing of the figure it is to be they are deducted from (i.e. the 2012 figure less replacements since. However, this base may need to be reassessed in SRC27 and recalculated in a more refined risk model.
Target Type	The outcome is to be minimised.
Target	The forecast outcome if for 18,000 comms pipes replaced across the period.
Financial assumptions and dependencies	Assumes funding is given to accommodate replacement rates Large proportion of comms pipes replaced are found ‘opportunistically’ during Mains rehab, leakage, comms pipe repairs etc. If funding for mains rehab is reduced, it is likely reduced Lead pipe replacement will also occur.
Operational assumptions	Assumes that there is capacity within the replacement teams to accommodate projected replacement rate - proposed rate is in line with replacement rates in 2022/23/24. Risk with move to our new delivery vehicle (DV4), currently majority of opportunistic replacements completed by Clancy’s.
External assumptions	Some replacements also driven by customer contacts (if they suspect they may have Lead pipes), this may be impacted by customer awareness of Lead. Several FOI’s from journalists have been received by SW and other water companies in the UK in 2024/25.
Additional information	There are projects in Larchfield and Gorgie looking at the removal of phosphate dosing.
Development to FBP	This will be updated with 2024/25 outturn along with further consideration of a target outcome.

6.5 Lead in customer supply pipes (Table 1 line 20)

Reference	Line reference 1.20 - Drinking water quality - Indicator of lead in customers supply pipes (%)
Definition	Percentage of random daytime regulatory samples with lead levels **not** greater than 3 µg/l.
Plot	
Base figures	The outturns for 2022 and 2023 are 98.1% and 98.4% respectively and forecast to be 98.0% in 2024/25%..
Basis of projection	Compares % compliance with <10ug/l and <3ug/l and extrapolates according to a forecast of compliance against <10ug/l. Forecast of <10ug/l is based on the expected improvement from replacing lead communication pipes. While there is variation on an annual basis the average from 2022 to 2026 in SRC27 is 98.1%, ending the period at 98.15%. The percentage then gradually increases to 98.3% at the end of SR27 driven off the back of opportunities to replace the lead in customer pipes from the SW communications pipe replacement.
Forecast commentary to SRC45	The forecast projects from the end of SR27 based on the long-term investment plan out to 2051 and increase to 98.5% alongside the SW communications pipe replacement and greater customer awareness.

Range of confidence	D4 "D" – the forecast is based on extrapolations and information about lead in SW network pipes (indirect), are not considered to be sufficiently reliable for target outcomes due to indirect assessments. "4"- there is uncertainty over the rate of change given than this it is dependent on customers allowing change. Based on 2022-2024 data, the ratio between % compliance for <10ug/l and <3ug/l has a variation +/- 0.25% so it is assumed that this will reflect the variation going forward. However, does not reflect uncertainty relating to the potential for the gap between compliance against <10ug/l and <3ug/l to widen if lead comms pipes are replaced at a faster rate than customer supply pipes. There is uncertainty in the levels that is reflected in the actual and forecast from 2022 to 2006. The average is 98.1% with average loss of 1.9%. The range of loss is 1.5% – 2.1% which is about. The margin of error is then 0.4 relative to 1.9 which is around 20% and hence "4".
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the expected investments in the same.
Target Suitability	Not suitable for target as proportion of samples >3ug/l is associated with customer-side lead, dependent on customers allowing change and indirectly influenceable.
Target Type	Reporting outcome rather than target outcome.
Target	Reported outcome.
Financial assumptions and dependencies	Funding is available to support Scottish Water lead communication pipe removal at the required rates, completion of pilot projects for customer-side lead removal and opportunities for lead supply pipe removal in place of replacing or providing new phosphate dosing e.g., Larchfield, Rawburn.
Operational assumptions	Operational teams and their contractors can continue to support removal of lead comms pipes relating to sample failures or where requested by customers at the required rates. Based on regulatory statistical sampling.
External assumptions	Support for customers and their willingness in removing their lead supply pipes. Measure does not differentiate between supply pipe and comms pipe lead – only there is lead present. Profile assumes customer do not always replace their pipe when we replace ours (opportunistic / on fail).
Additional information	Potential reduction of lead standard to 5ug/l. The current statistic is based on random sampling within supply zones this may need to be adjusted DWQR requires Regulatory sampling to be focussed on individual properties with high risk of lead piping as opposed to high risk supply zones.
Development to FBP	It remains an area of interest but is unlikely to be progressed further for the FBP.

6.6 Total drinking water compliance (Table 1 line 21)

Reference	Line reference 1.21 - Drinking water quality - Total drinking water compliance (%)
Definition	Total Water Quality compliance as reported in DWQR including samples at taps, service reservoirs and treatment works.
Plot	
Base figures	The 3-year average to 2024 (which excludes the covid year) is 99.926%, which is used as the comparator above. The forecast to the end of SRC27 is for a similar level.
Basis of projection	The projection is based on a forecast reduction in sample fails (set out in additional information) from the investment. This takes account of the potential impact of climate change to 2022/33. The forecast is for the score to increase to 99.95% for 2032 at the end of SR27, with sample fails reduced to 148. Relative to 2024 service reservoir fails are forecast to reduce from 53 to 24; water treatment fails are forecast to reduce from 123 to 109 and resource supply zones fails are forecast to reduce from 123 to 109. The reductions are driven by HAA chlorate, lead and microbiology. See further details in financial assumptions below.

Forecast commentary to SRC45	The forecast projects from the end of SR27 is based on continued investment to step the outcome level from 99.95 to 99.98% over the subsequent regulatory periods to 2051.
Range of confidence	B3 "B"- informed by the long-term investment profiles from the Strategic Cost benefit Analysis, it has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. "3" is a medium level of uncertainty. The 3-year average to 2023/24 99.926 to 2023/24 has a range of 99.913% to 99.937%. The sample fails or lost points is ±0.013 about an average lost points of 0.074, which is a just over ±10%. We assume a medium uncertainty.
Scenarios	The outcomes for all scenarios are similar with only small variations to the third decimal point from Scenario B additional investment in Water Quality (see Annex B).
Target Suitability	Historically it has been included in the OPA and targeted.
Target Type	The outcome is to be maximised.
Target	The projected outcome is 99.95%.
Sources	The projection was formed by the projections in the Strategic Cost Benefit Analysis and cross-checked with the Water planning team.
Financial assumptions and dependencies	The investment plan includes enhancement expenditure for drinking water quality improvement with investment under Management approach (MA006). Specific parameter forecast. This is not adjusted for varying sample volumes but

	includes adjustment for climate change upward to HAA5, Taste, and Odour.

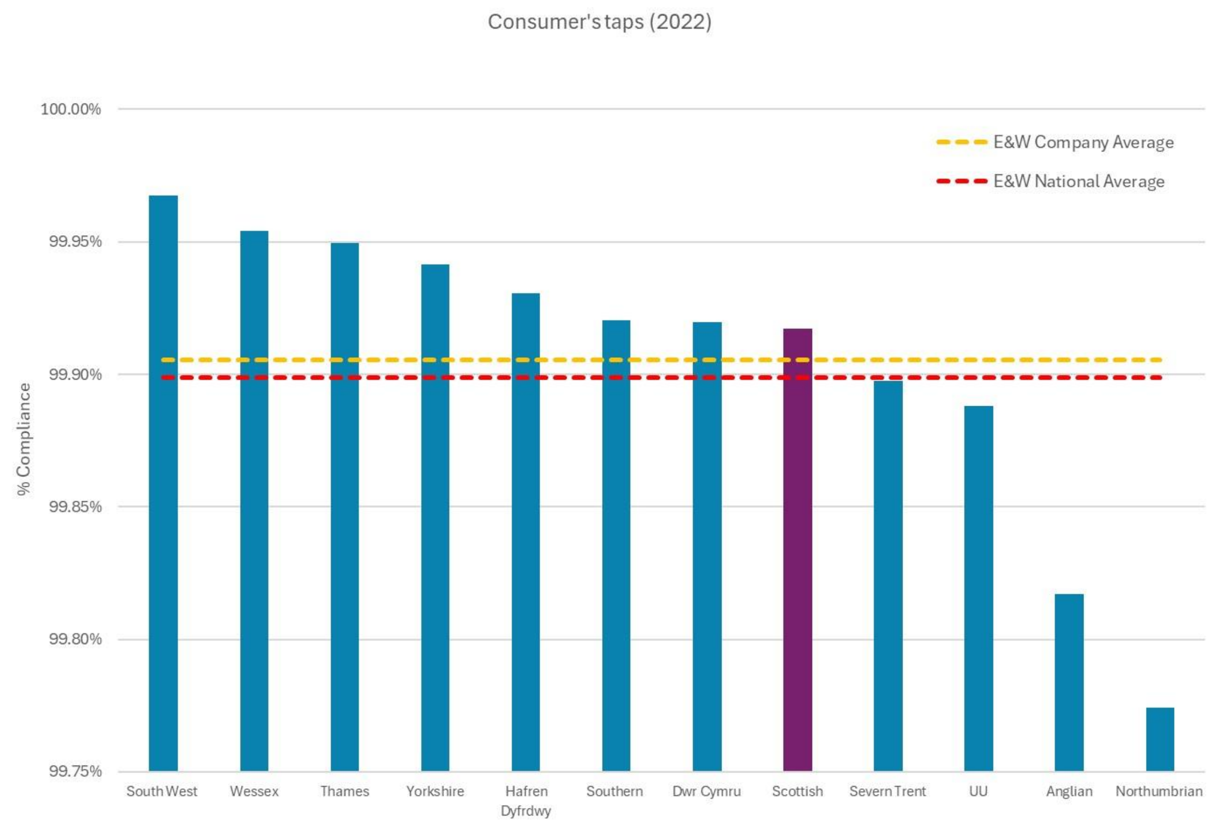
ParamName	AssetTyp	Fails.2024*	Fails.2025	Fails.2026	Fails.2027	Fails.2028	Fails.2029	Fails.2030	Fails.2031	Fails.2032
Coliform Bacteria	R	51	45	40	35	30	27	25	24	23
Cryptosporidium	T	8	6	6	6	5	5	4	4	3
Coliform Bacteria	T	20	19	18	17	16	15	14	13	12
Chlorate	Z	11	43	20	5	4	3	2	1	1
Coliform Bacteria	Z	38	38	37	36	35	34	33	32	31
HAA5 Total	Z	12	32	28	26	25	23	23	23	20
Iron	Z	24	22	22	22	20	20	18	18	18
Lead	Z	5	29	26	23	20	18	16	15	14
Manganese	Z	9	9	9	9	9	9	9	9	9
Odour	Z	15	3	3	3	3	5	5	5	5
Taste	Z	1	2	2	2	2	4	4	4	4
THMs	Z	0	1	1	1	1	1	1	1	1
R	SR	53	47	42	36	31	28	26	25	24
T	WTW	32	25	24	23	21	20	18	17	15
Z	RSZ	123	187	154	134	125	123	117	114	109
All	ALL	208	259	220	193	177	171	161	156	148

Operational assumptions	The operational improvements available will offset the risk of climate change.
External assumptions	The risk of climate change is offset by operational improvements.
Other assumptions	We assume that any introduction of risk-based sampling to the current regulatory sampling will have negligible effect on the metric reported. If this proves not to be the case, then an adjustment might be needed calibrate to the equivalent of the regulatory sample.
Additional information	The current definition is based on regulatory samples across all asset base – zones to use baseline sampling - including Cryptosporidium (non-UV irradiated). Detailed methodology to be agreed with DWQR for the Final Business Plan. Test volatility of risk based zonal sampling to confirm impact if any before Jan 2027. If low impact, we will add risk zonal samples into the measure. Comparative analysis of this metrics with the England & Wales companies is less readily available since the E&W movement to the Compliance Risk Index. A comparison was undertaken for 2022 & 2023 and indicated that SW is below the average for England & Wales on a comparable metric (see below). We propose to improve the total drinking water compliance measure outcome for the end of SR27.
Development to FBP	There will be further discussions with DWQR relating to the proposals to introduce risk-based sampling alongside the regulatory sampling and the impact that this might have on the reported level of total drinking water compliance.

Additional notes

The total drinking water compliance measures combined the scores at the tap, service reservoirs and treatment works. The projected outcome of 99.95% for 2032/33 would bring Scottish Water into alignment with the leading companies in England & Wales in the comparative analysis set out below.

4. Drinking Water Quality: % Compliance



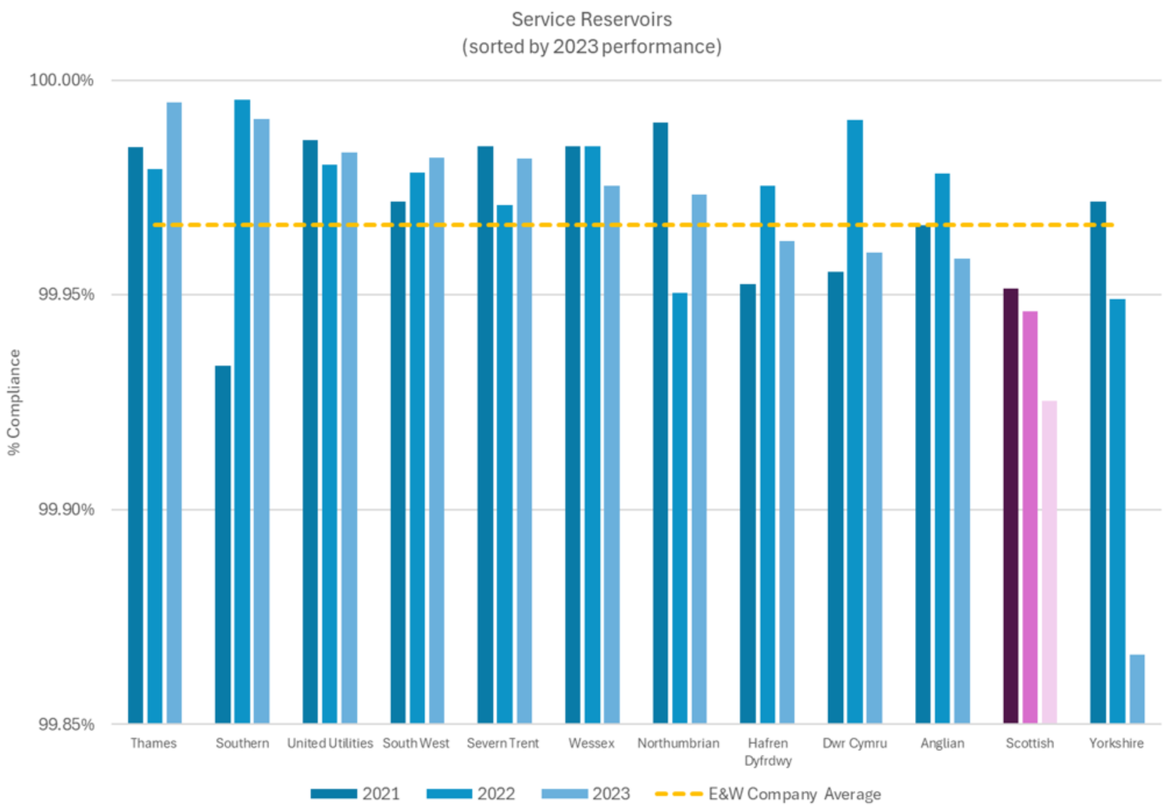
Consumer’s taps

Measured as % compliant tests, taken at the customer tap

- 2022 is the most recent year in which we are confident that a reasonable comparison can be made between E&W and Scotland, **with some exclusions made to E&W***

*Colony Counts After 3 Days At 22øc, Gross Alpha, Gross Beta, Residual Disinfectant – Free, Residual Disinfectant – Total and Total organic carbon have been removed from E&W.

4. Drinking Water Quality: % Compliance

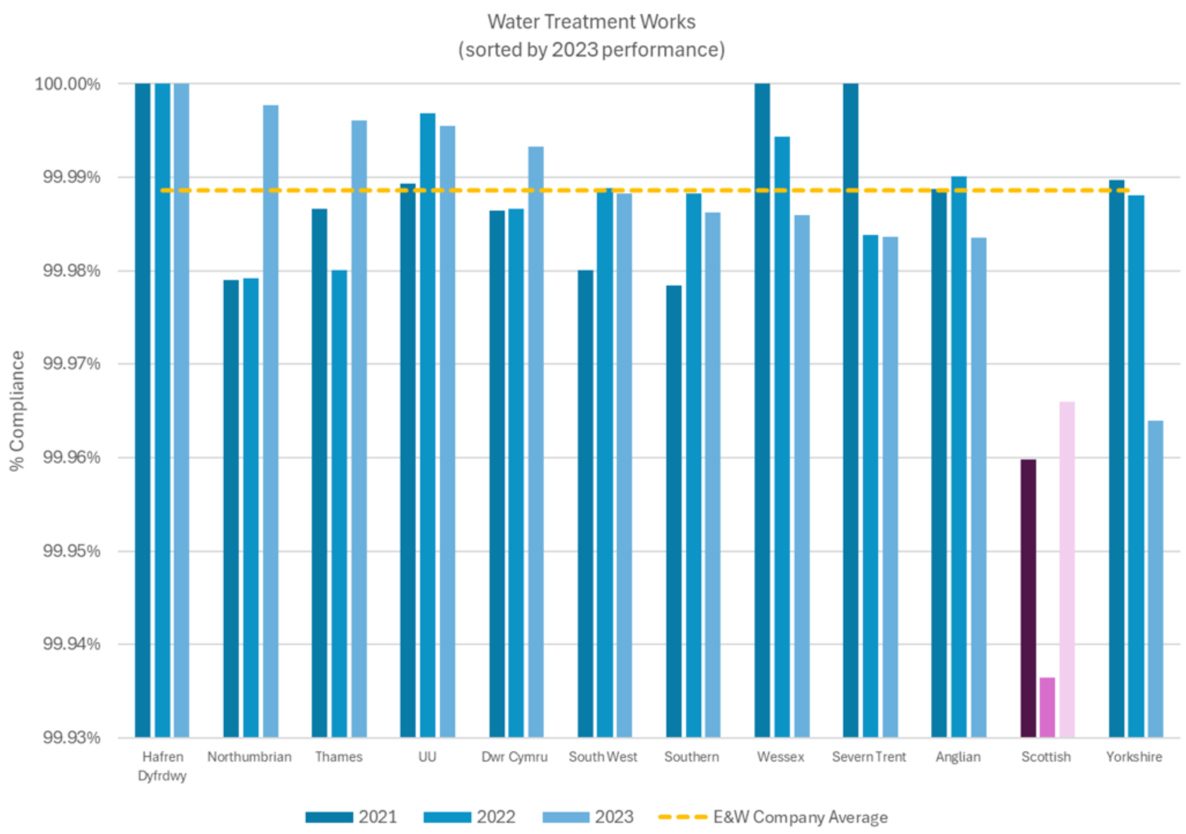


Service Reservoirs

Measured as % compliant tests, taken at Service Reservoirs.

Service Reservoir sampling regimes between E&W and Scotland are similar enough for a comparison to be made without adjustment.

4. Drinking Water Quality: % Compliance



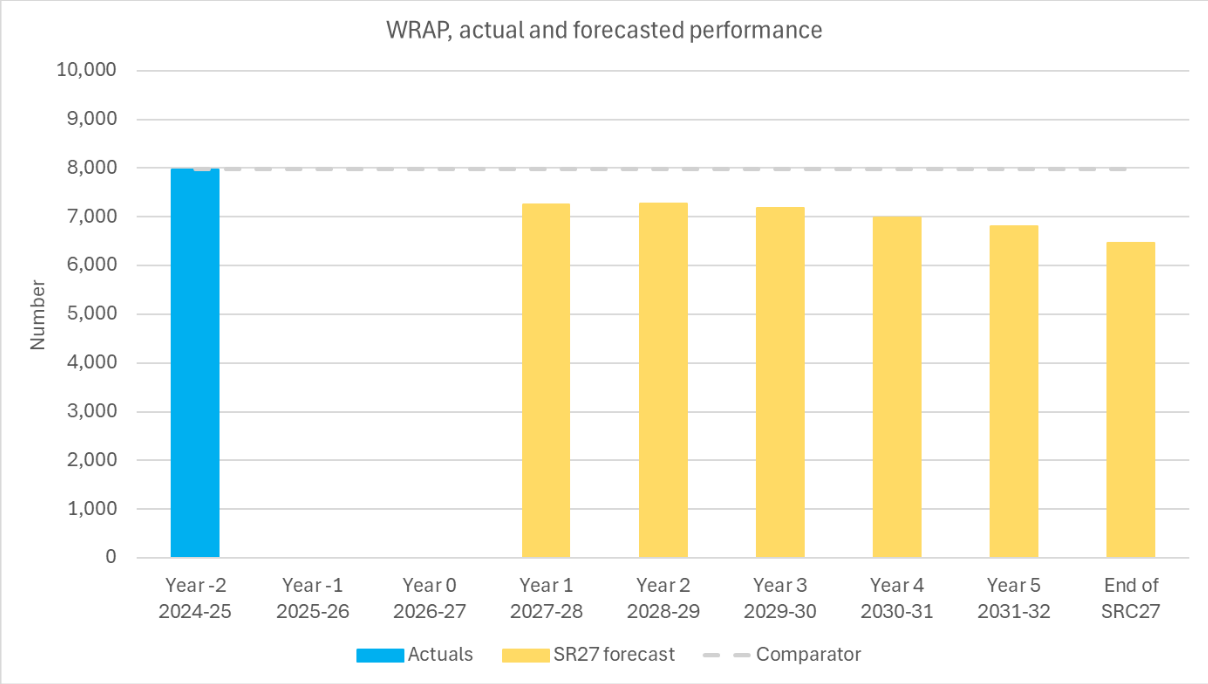
Water Treatment Works

Measured as % compliant tests, taken at Water Treatment Works

WTW sampling regimes differ between E&W and Scotland; in E&W, results of sampling for cryptosporidium oocysts at WTWs are not shared by the DWI .

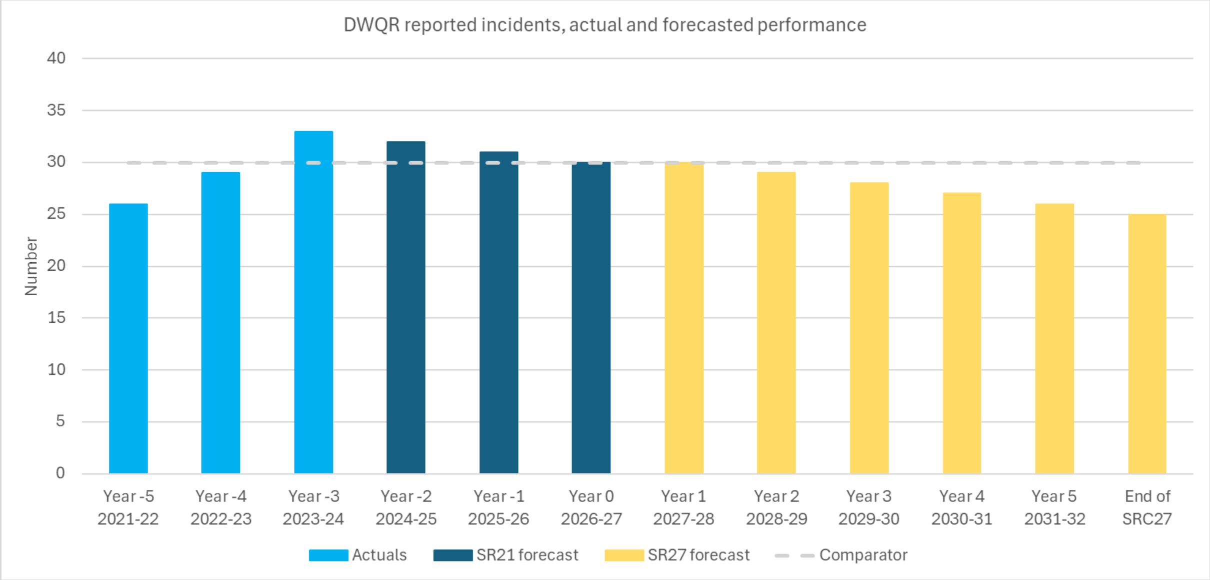
- For comparability these have been removed from Scottish Water's WTW % compliance data – although it should be noted that this is a substantive part of Scottish Water's sampling regime at WTWs, where around 6% of samples taken are for crypto oocysts.
- In 2023 SW took 5,745 samples of cryptosporidium oocysts) of which 8 failed.

6.7 Water risk assessment planning (Table 1 line 22)

Reference	Line reference 1.22 – Water risk assessment planning
Definition	The number of WQ WSZ & Hazard Pairs above long term tolerable threshold (including those considered significant), based on thresholds of 42 from WRAP using likelihood x consequence.
Plot	
Base figures	The 2024 outturn number is 7,975.
Basis of projection	The projection assumes a reduction from 7,254 to 6,465 from the start to the end of SR27.
Forecast commentary to SRC45	The long term forecast is for the number to reduce to about 2,500.
Range of confidence for SRC27 period	C4 - It is not yet within current performance monitoring, has received development attention and would need further development to the FBP to become sufficiently reliable for target outcomes. Importantly there is no historic performance assessment. Currently its central estimate has a high uncertainty. “C” as it is mainly through extrapolation and additional assumptions.

	"4" has high uncertainty as there is variation from additions relative to removals from investment from climate impact.
Scenarios	The outcome for Scenario C is the same as Scenario A. The outcome for Scenario B is a small improvement to 6,415 with the additional monitoring to support operations (see Annex D).
Target Suitability	This is a relatively new and untested metric and therefore will need further work to develop it for any target outcome.
Target Type	The outcome is to be minimised.
Target	This is potentially most suitable for a reportable outcome and could be a target outcome subject to adequate risk mitigation.
Financial assumptions and dependencies	Profile based on: • SR21 schemes delivering and treated water storage point benefits in 2026/27 to 2028/29 • SR27 treated water storage point enforcement notice completion by 2029/30 • HAA Scheme and enforcement notice in second half. • Disinfection (including advanced disinfection systems) / taste and odour improvements later in period.
Operational assumptions	The improvement is dependent on the successful implementation of operational changes.
External assumptions	Potential risk increase associated with climate change (not in numbers).
Other assumptions	
Additional information	Measure in development and still to be agreed in detail with DWQR.
Development to FBP	Further work to develop it for reporting and potentially further to a target outcome.

6.8 DWQR declared/report incidents (Table 1 line 23)

Reference	Line reference 1.23 – DWQR declared/reported incidents
Definition	The number of all Significant, Serious and Major events declared by DWQR for the calendar year.
Plot	
Base figures	The outturns for 2022/23 and 2023/24 are 29 and 33 respectively. The forecast for 2024/25 is 32.
Basis of projection	The forecast is for 30 by the end of SR21 to reduce to 25 by the end of SR27. This is a gradual progression of year-on-year reduction of one incident per annum.
Forecast commentary to SRC45	The long term projection is for DWQR incidents to reduce to 10.
Range of confidence for SRC27 period	C4 "C" through extrapolation as it is relatively newly developed in SR21. "4" confidence. The average of the 3 years to 2024 is 29.3 with a range of 26 to 33 which indicates a margin of error of 13% and hence "4".
Scenarios	The outcomes for Scenarios A and C are the same. There is a small improvement of 4 reported incidents for Scenario B to take it to 21 by the end of SR27.

Target Suitability	it is already applied within DWQR.
Target Type	It is an outcome to be minimised
Target	The forecast is for a reduction in the number of incidents to 26.
Financial assumptions and dependencies	Provision of auto shut at high-risk sites. Reduction in incident due to planned investment work
Operational assumptions	Improved training and operation of WTW. Improved training and operation of network.
External assumptions	Assumes no change to DWQR policy.
Additional information	There is no further information
Development to FBP	Further consideration as to how to reduce the volatility of the metric.

7 Waste water flows

7.1 Summary

Performance measures
The measures of annual internal sewer flooding of overloaded sewers and other causes (though with a severe weather exclusion) forms part of the current OPA.
In contrast the following metrics are new:

- The internal flooding register properties of overloaded sewers
- Annual external sewer flooded areas of overloaded sewers and other causes, including severe weather impacts)
- The external flooding register areas of overloaded sewers

Comparator metrics
The WICS Guidance identifies annual internal sewer flooded properties of overloaded sewers and other causes, including severe weather impacts) for comparison with England & Wales. This comparison is included in the assessment below.

Our Business Plan is to drive a stable internal sewer flooding register. We also monitor external sewer flooding areas rather than cartilage of properties to ensure that we identify where there is greatest value from investment and intervention.

Excluded measures
Outcomes are forecast for all the metrics within those listed by WICS.

Scottish Government Water Sector Principles
All these metrics relate to Principle 3 and 4 which are as follows:

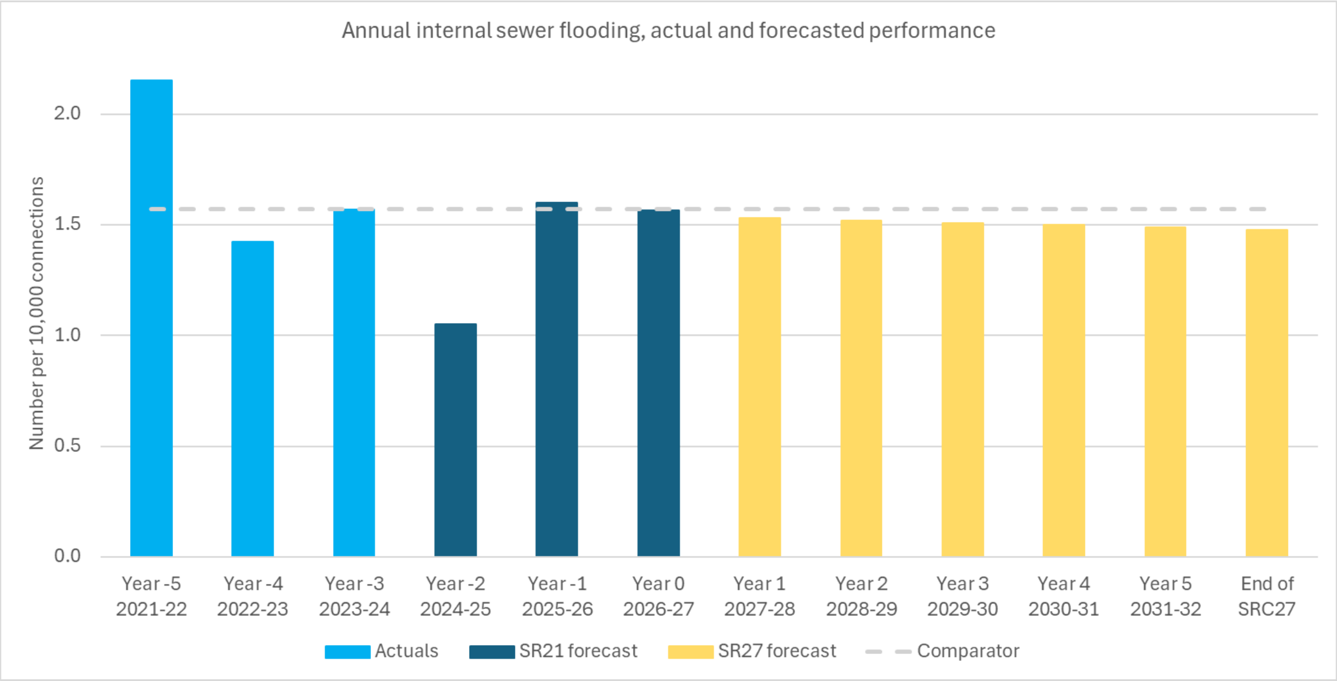
3. *The changing climate means we are seeing more extreme weather events such as periods of very heavy and/or intense rainfall which can lead to spills from drainage systems to the environment and/or cause flooding to homes and businesses. We need to make greater changes in the way we manage the consequences of extreme weather events as their frequency increases.*
4. *Many of Scotland's wastewater treatment works are located along the coast and are vulnerable to sea level rises. This means that we need to change our approach to managing our wastewater network. Unless we respond to the changing climate by adapting our sewage services now, the costs to households, businesses and the environment arising from floods from sewers will be much higher. We also want to maximise the opportunity to use resources from wastewater and to make it easier to adopt new and future technologies.*

National Performance Framework
The main national Performance Framework outcome categories covered by these metrics are:

- Health – Healthy and Active
- Communities - Vibrant and inclusive communities
- Environment – Protecting and enhancing the environment

Development for Final Business Plan
The risk of the effect so climate change and additional investigations on the levels reported for external sewer flooding and the internal register will need further consideration for the FBP.

7.2 Number of internal sewer flooding incidents (Table 1 line 24)

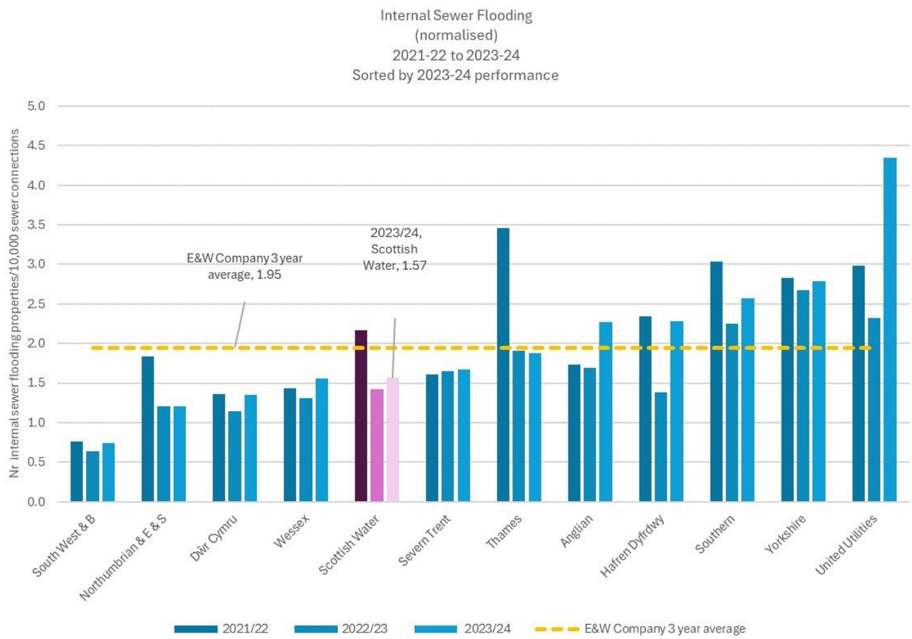
Reference	Line reference 1.24 – Internal sewer flooding – Number of internal sewer flooding incidents* (Number)
Definition	The number of internal sewer flooding incidents due to Scottish Water assets, including incidents where assets were overwhelmed by severe weather events, per 10,000 sewer connections. The number of internal sewer flooding incidents due to Scottish Water assets, including incidents where assets were overwhelmed by severe weather events, per 10,000 sewer connections. This measure includes flooding due to overloaded sewers (hydraulic flooding- FOS) and due to other causes (Flooding Other Causes - FOC). For this outcome measure, a flooding incident means the total number of properties flooded during each flooding event from a Scottish Water sewer. The forecast provided in the business plan includes all flooding incidents including those due to severe weather. It is a like for like comparator with England & Wales companies.
Plot	

Base figures	The 10 -year average number of IFOS and IFOC to 2024/25 including severe weather is 452 with 132 IFOS and 320 IFOC). This is used as the base figure for 2025/26. This is then divided by 269 for per 10.000 sewer connections.
Basis of projection	For IFOS we make no further adjustment for climate change for the SR27 forecast (but there is for subsequent periods). We apply several mitigation (reductions) that starts at 9 per annum for two years with some catch up and settles down to 3 pa. For IFOC apply reduction adjusted for intelligent networks, campaigns and repeats by 13 pa. The overall number per 10,1000 connections is 1.57 in 2026/27 and 1.48 in 2032/33.
Forecast commentary to SRC45	The projection is extended out to 2051 to align to the Long-Term Strategy. The main change is the addition of 10pa from climate change beyond SR27. The Sewer flooding register can be improved through targeted investment over the long term. This in in contrast to annual sewer flooding incidents that are forecast to increase with climate change and likely to get more volatile. The total pollution incidents in Wastewater are follow a similar upward profile from climate change but is forecast to be checked by greater asset health. In contrast, some serious pollution incidents can be more targeted through initiatives and investment.
Range of confidence for SRC27 period	C5 If would be a B if it were not for the volatility. As there is no B5 is becomes a C5. “B”- at this is largely based on historic trend analysis, has been subject to outturn monitoring and audit processes within current performance (including and excluding severe weather), has been subject to in-period forecasting and has historically been sufficiently reliable for target outcomes once the severe weather adjustment has been applied. “5” is a high level of uncertainty with the inclusion of severe weather. The volatility in the base year number is reflected in the range of values being 283 to 598 with average of 452 over 10 year. This has a margin of error between 25 to 50% including severe weather. If we look at the volatility over 4 years excluding severe weather, then the margin of error is between 10 and 25% – the range of values is 280 to 407 with average of 358. Hence the inclusion of severe weather increases the baseline and the volatility.
Scenarios	The forecast outcome for Scenarios A, B and C are the same.
Target Suitability	A measure excluding severe weather is included in the OPA and suitable for target. The inclusion of severe weather would make the metric more variable as a reported annual figure, and in a way that is outside the control of Scottish Water. Our preference is to retain the metric in the Current OPA. This would improve the accuracy of the confidence grade, retain existing process and continuity of comparison of the OPA. The metric with severe weather would still be provided for comparison with E&W.
Target Type	The outcome is to be minimised.
Target	It is a reportable outcome and most suitable for a target outcome with severe weather excluded.
Financial assumptions and dependencies	Assumes the allocated level of investment in the SRC27 plan

Operational assumptions	Assumes a level of mitigation, use of intelligent networks and continuing customer campaigns.
External assumptions	The inclusion of severe weather makes this metric more variable on a yearly basis than the current metric in OPA that excludes severe weather.
Other assumptions	OFWAT definition of incident is comparable to SW use of 'property'
Additional information	This measure includes flooding due to: • Overloaded sewers (hydraulic flooding- FOS) and • Due to other causes (Flooding Other Causes - FOC). For this performance commitment, a flooding incident means the total number of properties flooded during each flooding event from a Scottish Water sewer. This outcome measure is comprised of two Service Measures. Service Measure 1: o The number of internal incidents of sewer flooding due to hydraulic incapacity of Scottish Water assets. This includes main sewers (IFOS). Service Measure 2: o The number internal incidents of sewer flooding due to equipment failure blockage or collapse (IFOC) of Scottish Water assets. This includes main sewers and laterals. Assumptions: All flooding incidents should be reported in the appropriate category, irrespective of the severity of the storm. Scottish Water may indicate in the commentary when flooding incidents have been due to exceptionally severe rainfall and this information will be considered when producing the Customer Service report. This should be supported by appropriate meteorological data. Where "Severe Weather" is used we will require an explanation in the commentary of the weather situation, why it is so unusual and its impact. Per 10,000 sewer connections is defined using current SR21 OPA methodology; the number of properties connected to our waste network. This scalar is a count of the total number of properties connected to the sewerage network. It covers both household and non-household (commercial) properties as well as measured and unmeasured properties. This figure can be found within the Section A and Section E tables that are submitted to WICS each year. Throughout the reporting year it is common to use the previous year's signed-off scalars to calculate the in-month OPA scores. At the end of

	each year, once the new scalars have been calculated, the year-end OPA score will then be revised to reflect the newly updated scalars. Flooding: is categorised according to location (domestic, residential, non-domestic, commercial). It is further defined according to impact; internal flooding above floor level, internal flooding in occupied basement, flooding below floor level, flooding within unoccupied basement or within an attached garage (with access to living space or living space above the garage). Counting approach: agreement needs to be reached as to how incidents are recorded. Example: five properties which flooded twice in a year would currently be counted as ten incidents.
Development to FBP	Consideration of how best to address volatility in the metric.
Additional information Historic performance shows that Scottish Water is comparable to the 3-year average in E&W of 1.95 number of sewer flooded properties per 10,000 sewer connections.	

3. Service Comparisons



SW Internal
General

Internal Sewer Flooding

The number of internal sewer flooding incidents normalised per 10,000 sewer connections.

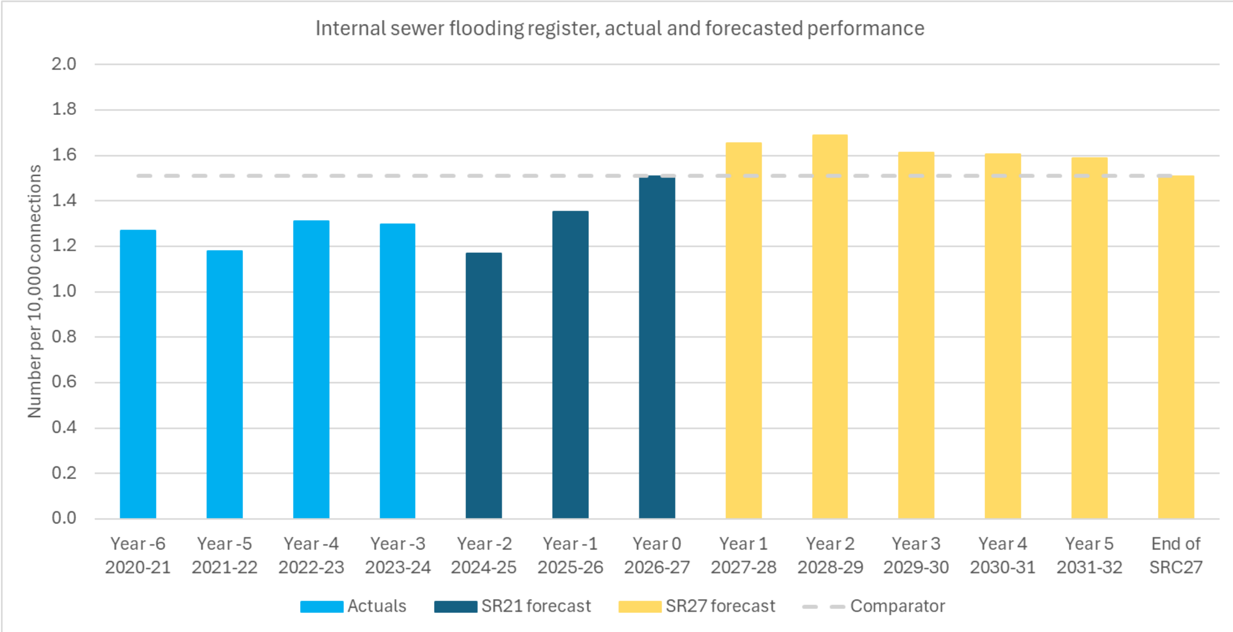
Includes flooding due to overloaded sewers (hydraulic flooding) and due to other causes (Flooding Other Causes - FOC).

It **includes** sewer flooding due to severe weather events.

Flooding events caused by sewers, lateral drains, and pumping stations transferred under the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011 (2011 Regulations) are **included**.

7.3 Number of internal sewer flooding register (Table 1 line 25)

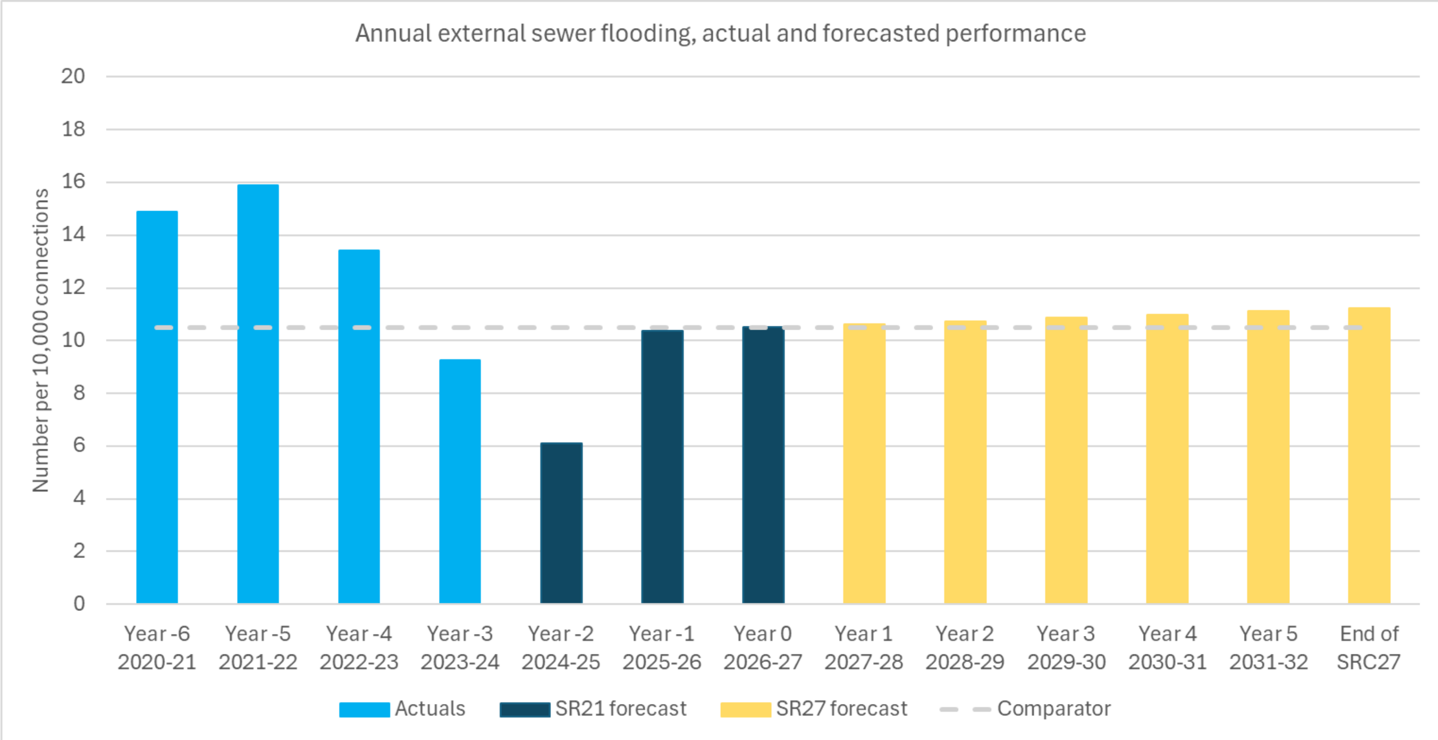
Reference	Line reference 1.25 - Internal sewer flooding - Number of properties at risk of internal flooding (Number)
Definition	The number of properties at risk of internal sewer flooding incidents per 10,000 sewer connections.

Plot	
Base figures	The 2024/25 register was 314 properties. This number is then divided by 269 as the per 10,000 sewer connections.
Basis of projection	The net additions (additions less removals) are projected to take the register to 406 properties by the end of SR21. There are 60 additions pa for the two last year in SR21, which is aligned to the SR21 period forecast and reflects the expectation of an increase in additions following some mild years to-date SR21. The capital programme forecast is to remove 28 in total. The net figure of 92 is then the increase from 314 to 406. The average annual number of additions over the current SR21 period is then 50 properties pa based on the 10-year average to 2024/25. On average 50 removals pa are funded for the period and profiled with outputs in portfolio management. This means that the register is forecast is maintained at 406 at the end of SRC27. The metric score is 1.51 forecast to be at the end of SR27.
Forecast commentary to SRC45	The projection is extended out to 2051 to align to the Long-Term Strategy which includes a change in definition to properties at risk 1 in 30. The number of additions is forecast to increase to 70, 140 and 280 properties pa in the regulatory periods after SRC27, as a consequence of climate change impacts. The funding level is forecast to increase alongside this to remove 55, 165 and 330 properties pa over the three regulatory periods respectively. This forecast for the register is then under 100 at the end of 2051. The score is then 0.17.

	The sewer flooding register can be improved through targeted investment over the long term. This in in contrast to annual sewer flooding incidents that are forecast to increase with climate change and likely to get more volatile. The total pollution incidents in Wastewater are follow a similar upward profile from climate change but is forecast to be checked by greater asset health. In contrast, some serious pollution incidents can be more targeted through initiatives and investment.
Range of confidence for SRC27 period	C4 - It is not yet within current performance monitoring, has received development attention and would need further development to the FBP to become sufficiently reliable for target outcomes and currently its central estimate has a high uncertainty. “C” as it is mainly through historic average, extrapolation and additional assumptions. “4” has high uncertainty as there is variation from additions relative to removals from investment from climate impact. The range of additions over the last 10 years is 18 to 95 about an average annual reported value of 344 properties. The margin of error is in the range of 10 to 25%.
Scenarios	The outcome for Scenario B forecasts the addition of 53 removals to improve the outcome to 1.31 at the end of SRC27. The outcome for Scenario C forecasts the reduction of 150 removals to worsen the outcome to 2.07. The changes from Scenario A investment are set out in Annex D.
Target Suitability	The metric is subject to high volatility that makes is less suitable to a target outcome.
Target Type	The forecast outcome is as set out in Table 1 but is subject to high volatility.
Target	This is suitable for a reportable outcome.
Financial assumptions and dependencies	Assumes the allocated level of investment in the SRC27 plan.
Operational assumptions	There is no impact as the register is defined by criteria.
External assumptions	Climate change is factored into the long term projections.
Other assumptions	No properties with internal flooding caused by severe weather enter the internal sewer flooding register as it is limited to specific flood risk criteria.
Additional information	This measure is a count of the number of properties on the internal at risk register and is based on current Annual Return methodology. Currently report: 1:10; 2:10;1:20; Total of (1:10 + 2:10). Internal and External report different totals This measure is the total of 1:10 + 2:10

Development to FBP	Update with 2024/25 outturns.

7.4 Number of External sewer flooding areas (Table 1 line 26)

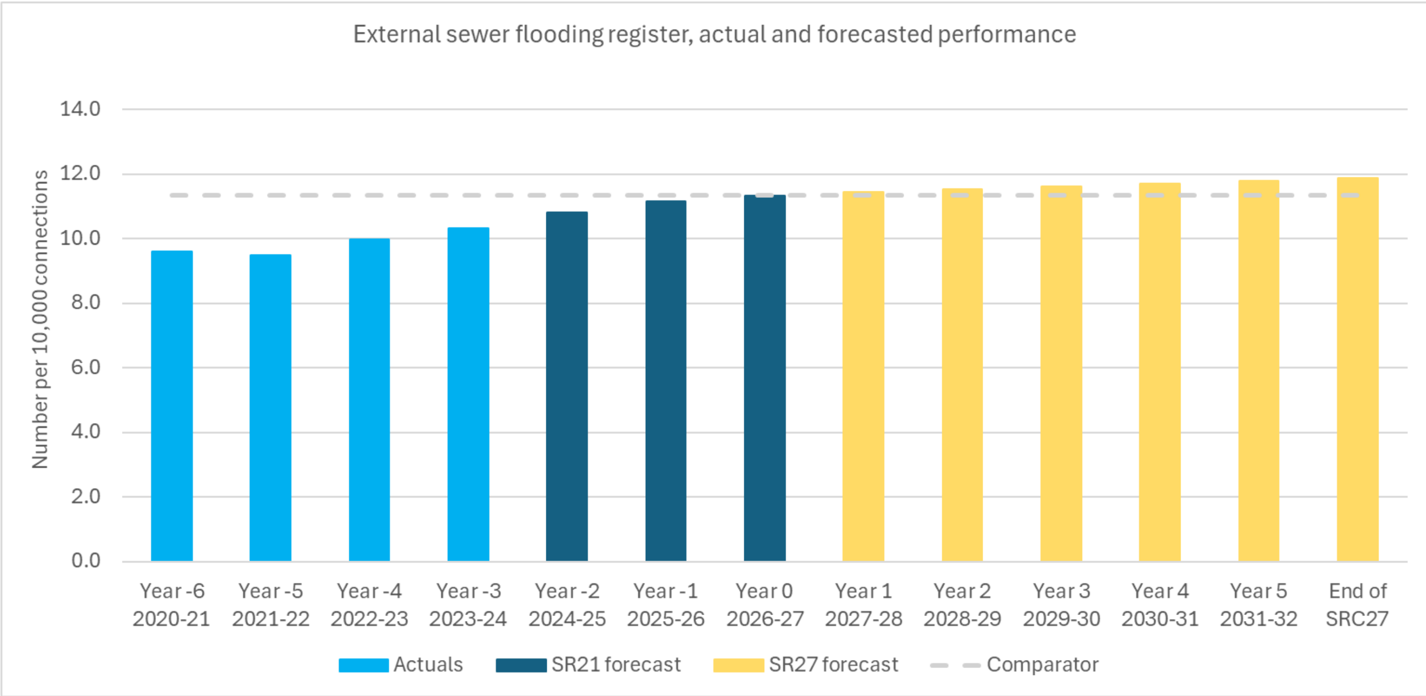
Reference	Line reference 1.26 - External sewer flooding - Number of external sewer flooding (Number)
Short Definition	The number of external sewer flooding incidents due to Scottish Water assets, including incidents where assets were overwhelmed by severe weather events, per 10,000 sewer connections. This measure includes flooding due to overloaded sewers (hydraulic flooding) and due to other causes (Flooding Other Causes - FOC). For this outcome measure, a flooding incident means the total number of areas flooded during each flooding event from a Scottish Water sewer. It includes all areas inside and outside property curtilage and areas such as roads, highways, and public amenities. The forecast provided in the business plan includes all flooding incidents including those due to severe weather.
Plot	
Base figures	The 10-year average number of EFOS and EFOC to 2024/25 if forecast to be 2745 and is used as the base figure for 2025/26 – with 328 EFOS and 2745 EFOC. The This is then divided by 269 for per 10.000 sewer connections.

Basis of projection	For EFOS we make no further adjustment for climate change for the SR27 forecast (There is also no climate change for subsequent periods). We have an uplift attributed to an increase in the external register additions of 34 incidents pa based on 10% of the external sewer flooding register. We apply several mitigations (reductions) of 1 pa from the start of SR27. For IFOC apply reduction adjusted for intelligent networks and campaigns 8.3 pa. The metric score at the end of SR27 is 11.24.
Forecast commentary to SRC45	The projection is extended out to 2051 to align to the Long-Term Strategy. The same additions and removals are assumed as in SR27 for the three subsequent regulatory periods. The sewer flooding register can be improved through targeted investment over the long term. This in in contrast to annual sewer flooding incidents that are forecast to increase with climate change and likely to get more volatile. The total pollution incidents in Wastewater are follow a similar upward profile from climate change but is forecast to be checked by greater asset health. In contrast, some serious pollution incidents can be more targeted through initiatives and investment.
Range of confidence for SRC27 period	C5 - It is not yet within current performance monitoring and has a high uncertainty. "C" as it is mainly through historic average and additional assumptions. "5" has very high uncertainty as there is variation from weather patterns. The volatility in the base year number is reflected in the range of values being to 1646 to 4213 in the 10 years to 2024/25. This indicates a margin of error between 25% and 50% about the average of 2745.
Scenarios	The outcomes for Scenarios A, B and C are the same.
Target Suitability	The inclusion of EFOS that might be identified from further investigations makes the forecast less reliable/predictable than IFOS.
Target Type	The forecast outcome is as set out in Table 1 but is subject to very high volatility.
Target	This is suitable for a reportable outcome.
Financial assumptions and dependencies	Assumes the allocated level of investment in the SRC27 plan
Operational assumptions	Assumes a level of mitigation, use of intelligent networks and campaigns.
External assumptions	The metric is impacted by climate and weather patterns and assumptions are made of these.
Other assumptions	There is an impact from greater investigations.

Additional information	For this outcome, a flooding incident means the total number of areas flooded during each flooding event from a Scottish Water sewer. This measure is based on Scottish Water's current approach to investigating and classifying external sewer flooding. This outcome measure is comprised of two Service Measures. Service Measure 1: o The number of areas experiencing an external incident of sewer flooding due to Scottish Water. This includes main sewers and laterals. The cause of flooding is due to hydraulic incapacity (FOS) Service Measure 2: o The number of areas experiencing an external incident of sewer flooding due to Scottish Water. This includes main sewers and laterals. The cause of flooding is due to equipment failure, blockage or collapse (FOC). Assumptions: All flooding incidents should be reported in the appropriate category, irrespective of the severity of the storm. Scottish Water may indicate in the commentary when flooding incidents have been due to exceptionally severe rainfall and this information will be considered when producing the Customer Service report. This should be supported by appropriate meteorological data. Where "Severe Weather" is used we will require an explanation in the commentary of the weather situation, why it is so unusual and its impact. Per 10,000 sewer connections is defined using current SR21 OPA methodology; the number of properties connected to our waste network. This scalar is a count of the total number of properties connected to the sewerage network. It covers both household and non-household (commercial) properties as well as measured and unmeasured properties. This figure can be found within the Section A and Section E tables that are submitted to WICS each year. Throughout the reporting year it is common to use the previous year's signed-off scalars to calculate the in-month OPA scores. At the end of each year, once the new scalars have been calculated, the year-end OPA score will then be revised to reflect the newly updated scalars. Areas: defined as areas using the current definitions of external flooding. This includes other flooded areas such as roads, highways, public amenities. This description does not match OFWAT definition. Flooding investigation: Maintain current approach to investigating extent of external flooding. This approach does not match OFWAT definition. Flooding: is categorised according to location (driveway/ access, garden/boundary, detached garage, attached garage without access to living space or living space above, agricultural land, public footpath/roadway, public open space/waste ground.

	Counting approach: agreement needs to be reached as to how incidents are recorded. Example: five areas which flooded twice in a year would currently be counted as ten incidents.
Development to FBP	Consideration of how to address the risk and volatility.

7.5 Number of External sewer flooding areas on risk register (Table 1 line 27)

Reference	Line reference 1.27 - External sewer flooding - Number of properties at risk of external flooding (Number)
Definition	The number of areas at risk of external sewer flooding incidents per 10,000 sewer connections. This measure is a count of the number of areas on the external at risk register and is based on current Annual Return methodology.
Plot	
Base figures	The 2024/25 register was 2906 areas. The number is then divided by 269 to form the per 10,000 sewer connections for the metric score.
Basis of projection	The net additions (additions less removals) is projected to take the register to 3052 areas by the end of SR21.

	The 10-year average of additions to 2024/25 is 108 pa for the last two years in SR21. The capital programme forecast is to remove 70 in total. The net figure of 146 is then the increase from 2906 to 3052. The figure of 128 additions per annum is assumed for the SR27 period. This takes the 10-year average of 108 per annum plus a further 20 per annum identified from climate change and investigations. 104 per annum removals are funded for the period. This means that the register is forecast to rise to 3196 at the end of SRC27 with a metric score of 11.88.
Forecast commentary to SRC45	The number of additions is forecast to increase by 138 pa in the regulatory periods after SRC27 because of an additional increase of 10 pa for climate change and investigation impacts. The funding level is forecast to increase alongside this to remove 104, 200 and 400 areas pa over the three regulatory periods respectively. This leaves the register at 1500 at the end of 2051. The sewer flooding register can be improved through targeted investment over the long term. This in in contrast to annual sewer flooding incidents that are forecast to increase with climate change and likely to get more volatile. The total pollution incidents in Wastewater are follow a similar upward profile from climate change but is forecast to be checked by greater asset health. In contrast, some serious pollution incidents can be more targeted through initiatives and investment.
Range of confidence for SRC27 period	C5 – The data has not received the same attention as the internal sewer register and is subject to potential changes with the increased focus of our Long Term Strategy. As such it has a high uncertainty about these central estimates. “C” as it is mainly through historic average, extrapolation and additional assumptions. “5” has very high uncertainty as there is uncertainty on the impact of further investigations on the base number. We assume the same confidence grade as the annual figure due to the uncertainty around climate change and investigations.
Scenarios	The outcomes for Scenarios A and C are the same. The outcome for Scenario B is improved with a reduction to 11.80. The changes from Scenario A investment are set out in Annex D.
Target Suitability	The inclusion of EFOS that might be identified from further investigations makes the forecast less reliable/predictable than IFOS.
Target Type	The forecast outcome is as set out in Table 1 but is subject to very high volatility.
Target	This is suitable for a reportable outcome.
Financial assumptions and dependencies	Assumes the allocated level of investment in the SRC27 plan and a set of unit costs
Operational assumptions	We have factored in assumptions on the impact of reported figures from investigations which are highly uncertain.

External assumptions	We have included an adjustment for climate change in the long-term projections
Other assumptions	
Additional information	Current internal reporting is for at risk: 1:10; 2:10; 1;20; Total of (1:10 + 2:10 + 1:20). Internal and External currently report different totals. This measure is the total of 1:10 + 2:10 Assumptions: Per 10,000 sewer connections is defined using current SR21 OPA methodology:; the number of properties connected to our waste network. This scalar is a count of the total number of properties connected to the sewerage network. It covers both household and non-household (commercial) properties as well as measured and unmeasured properties. This figure can be found within the Section A and Section E tables that are submitted to WICS each year. Throughout the reporting year it is common to use the previous year's signed-off scalars to calculate the in-month OPA scores. At the end of each year, once the new scalars have been calculated, the year-end OPA score will then be revised to reflect the newly updated scalars. Areas: defined as areas that are on the At Risk Register, using the current definitions of external flooding. Flooding: is categorised according to location (domestic, residential, non-domestic, commercial). It is further defined according to impact; internal flooding above floor level, internal flooding in occupied basement, attached garage without access to living space or living space above, flooding below floor level, flooding within unoccupied basement or within an attached garage.
Development to FBP	Consideration of the risk of investigations and volatility.

8 Water Environment

8.1 Summary

Performance measures

The measures of WwTW compliance, sludge compliance, serious environmental pollution incidents (Category 1 & 2) in our water and wastewater systems and total environmental pollution incidents (Category 1 to 3) in our wastewater system and included in the current OPA

In contrast the following metrics is new:

- UIDs

Comparator metrics

The WICS Guidance identifies metrics as offering the potential for benchmarking with England & Wales including:

- serious environmental pollution incidents (Category 1 & 2) in our water and wastewater systems
- total environmental pollution incidents (Category 1 to 3) in our wastewater system

We also include a comparison of these.

Our Business Plan is to drive improvement where is it of most value to our customers, which is in unsatisfactory intermittent discharges and serios pollution incidents in the SW network.

Excluded measures

Outcomes are forecast for all the metrics within those listed by WICS.

Scottish Government Water Sector Principles

All of these metrics (except for UIDS) relate to Principle 1 which is as follows:

> *Water is a precious resource – it is essential for life. It supports our lives, agriculture and businesses (including distilleries and manufacturing etc.) and supports our environment. We will need to consider the water needed to water crops to maintain food supplies, or make different choices about the crops we grow, support tourism and to support new lower carbon industry, such as hydrogen production. At the same time, we must ensure we have enough water to provide drinking water supplies which are essential for public health and to protect Scotland's environment.*

UIDs relate to Principles 3 and 4 which are as follows

3. *The changing climate means we are seeing more extreme weather events such as periods of very heavy and/or intense rainfall which can lead to spills from drainage systems to the environment and/or cause flooding to homes and businesses. We need to make greater changes in the way we manage the consequences of extreme weather events as their frequency increases.*
4. *Many of Scotland's wastewater treatment works are located along the coast and are vulnerable to sea level rises. This means that we need to change our approach to managing our wastewater network. Unless we respond to the changing climate by adapting our sewage services now, the costs to households, businesses and the environment arising from floods from sewers will be much higher. We also want to maximise the opportunity to use resources from wastewater and to make it easier to adopt new and future technologies.*

National Performance Framework

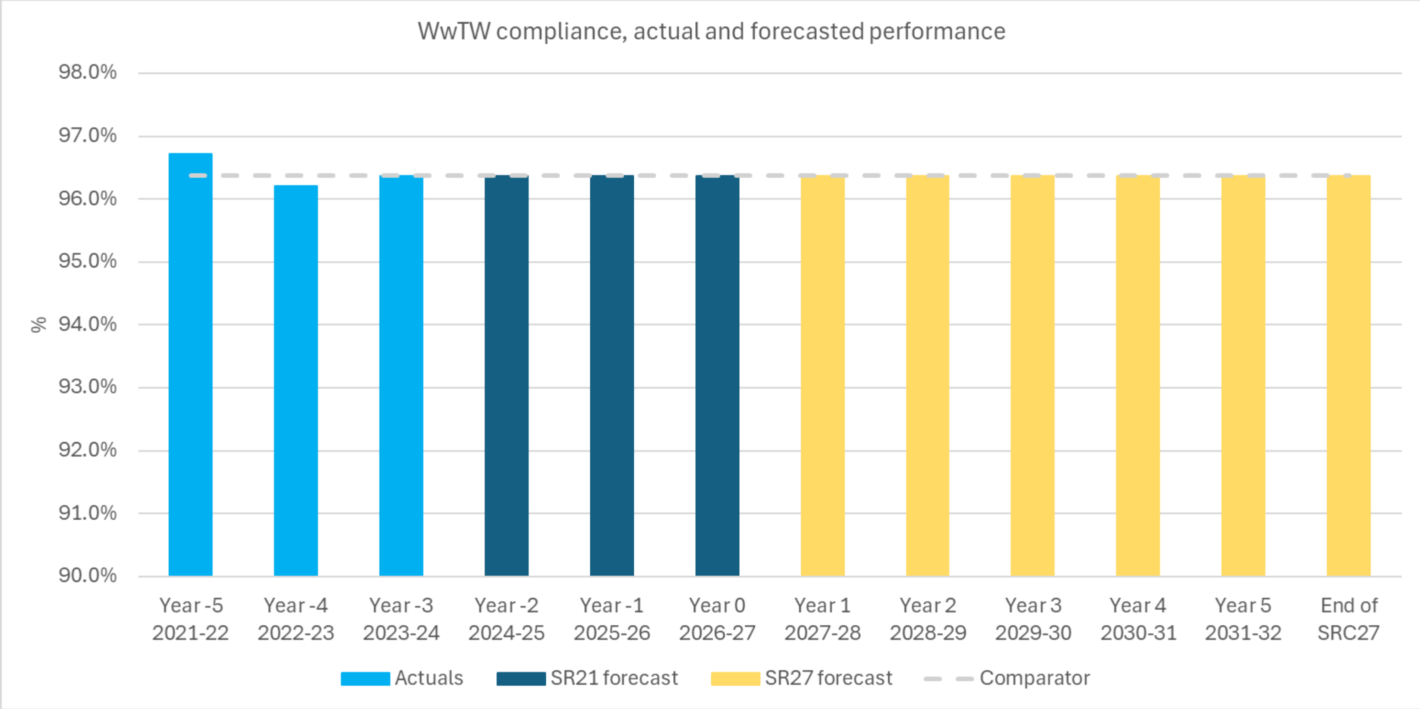
The main national Performance Framework outcome categories covered by these metrics are:

- Communities - Vibrant and inclusive communities
- Environment – Protecting and enhancing the environment.

Development for Final Business Plan

The process for accrediting and reporting UIDs will need further development for the FBP.

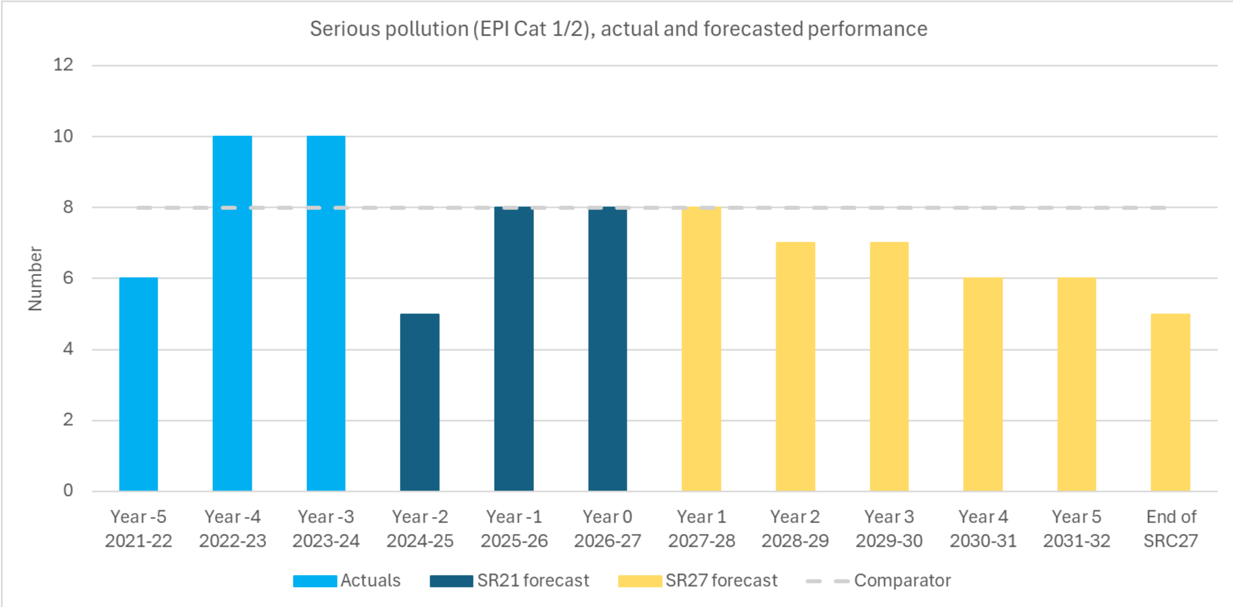
8.2 Percentage compliance with SEPA discharge permits (Table 1 line 28)

Reference	Line reference 1.28 - Discharge Permit Compliance - Percentage compliance with SEPA discharge permits (%)
Definition	Percentage of wastewater treatment works (WwTWs) complying with their Scottish Environment Protection Agency (SEPA) discharge permit requirements. This includes final effluent compliance and excludes EPAS.
Plot	
Base figures	The outturn for 2023/24 is 96.20%. The 3-year average to 2023/24 is 96.37%. There were on average 21 non-compliant works pa out of 580 works in this period. This yields a baseline value of 96.37%

Basis of projection	There are five major risks we are managing through the projections: (i) Growth exceeding the rate we are increasing capacity (ii) 146 sites with 177 process units in place with approximately 62 sites chemical dosing facilities that involve higher opex. (iii) asset condition of PFIs and the intensive maintenance regime model they operate to overcome lack of asset redundancy/capacity (iv) generally aging assets at our works. (v) very limited enhancement expenditure allocated to final effluent. In this situation SRC27 programme is forecast to maintain service at around 21 failing works pa. which is 96.37% to the end of SRC27.
Forecast commentary to SRC45	The forecast projects from the end of SR27 based a reduction to 18, 14 and 9 non-compliant works for final effluent compliance by the end of the respective regulatory periods.
Range of confidence for SRC27 period	B3 "B"- extrapolation of the past, it has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. "3" is a medium level of uncertainty.
Scenarios	Scenario B and C are the same as Scenario A as the investments are the same.
Target Suitability	A similar measure of the number of treatment works that are non-compliant is targeted within the current OPA. It is suitable for a target outcome.
Target Type	The outcome is to be maximised.
Target	The target level of outcome is as per Table 1 at 96.37%.
Financial assumptions and dependencies	Assumes that the overall investment, including asset repair, refurbishment and replacement, for WwTWs to offset the risk and maintain service.
Operational assumptions	Assumes that the operational activity can maintain service in the presence of the risks stated above.
External assumptions	Weather patterns impact the performance and are assumed to be similar to the base forecast through the period
Additional information	There are potential changes ahead to the way in which SEPA look at compliance. In addition to Final Effluent, they are looking to add Pass Forward Flows, this could require a total WwTW compliance statistic to be recalibrate.

Development to FBP	Currently we have a Compliance measure that is focused on Final Effluent. Compliance at the works take account of many aspects of the works including functionality, availability and licences. SEPA is currently consulting on EPAS (Environmental Performance Assessment System). It is a program designed to provide a more comprehensive look at environmental risks associated with facilities and missions. Its coverage could extend beyond the treatment works. The development of a future compliance metric around EPAS remains a future task and is unlikely to be available within SR27. The introduction of EPAS to the into a broader compliance measure would cause the compliance levels to reduce as a percentage score below the current final effluent compliance score.

8.3 Number of serious pollution incidents for W&WW (Table 1 line 29)

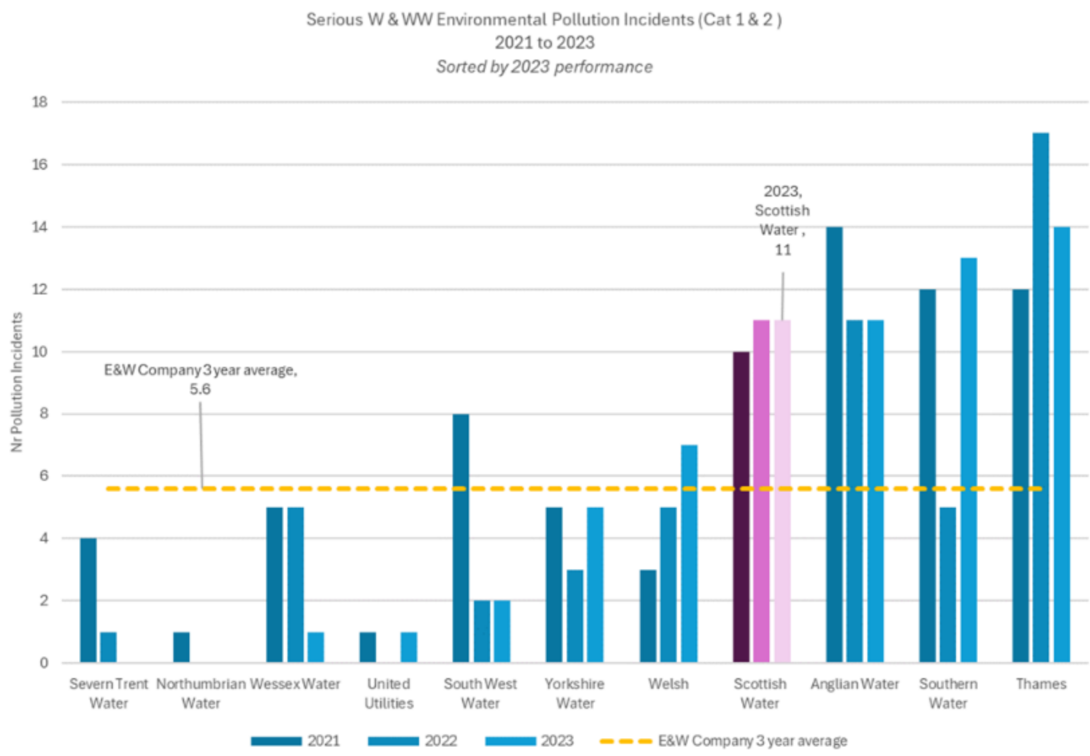
Reference	Line reference 1.29 - Serious pollution incidents (EPI Cat 1/2) - Number of serious pollution incidents* (Number)
Definition	The number of serious environmental pollution incidents (EPIs) categorised as 1 and 2 as set out in the reporting guidance from SEPA during calendar year, emanating from a discharge or escape of a contaminant from a water company sewerage asset or water supply asset affecting the water environment. To include Water and Waste Water incidents. This is a like for like comparison with E&W.
Plot	
Base figures	3-year average to 2024 is 8, which is the basis of the forecast for 2025 at 8, while the latest outturn value in 2024 is 5.
Basis of projection	The forecast for 2026 and 2027 is 8. Subsequently the forecast reduces to 5 by the end of SR27.
Forecast commentary to SRC45	The forecast reduction in the service level in the long term to 4, 3 and 2 over the subsequent regulatory periods respectively from monitoring investment and response.

Range of confidence for SRC27 period	B4 "B"- largely based on historic trend analysis, it has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. "4" is a high level of uncertainty, with a risk from climate change, of 25%, but we are looking to reduce this volatility. The range about the average of 8 is 6 to 10 which is up to 25%.
Scenarios	Scenario B and C are forecast to be the same as Scenario A as there is no change in investment.
Target Suitability	A similar measure of weighted Cat 1& 2 W and WW is targeted within the current OPA. This is suitable for as a target outcome.
Target Type	The outcome is to be minimised.
Target	This is an outcome target.
Financial assumptions and dependencies	Overall investment sufficient to offset some volatility risk from aging assets and temporary solutions.
Operational assumptions	Retain existing reporting process & methodology (OFWAT comparable) EPI reporting is based on calendar year Existing sewer length methodology is used
External assumptions	The risk from weather pattern is mitigated in part.
Additional information	The target here lines closely with the average in England & Wales.
Development to FBP	Impacts from EPAS to be considered.

Additional information

The historic performance is stable. Historic performance shows Scottish Water is above the 3-year financial-year average in E&W which is 5.6 incidents. There have been incentives within the current OPA to maintain and improve service. The projected outcome of 5 by 2032/33 would bring Scottish Water's performance into line with this average for England & Wales.

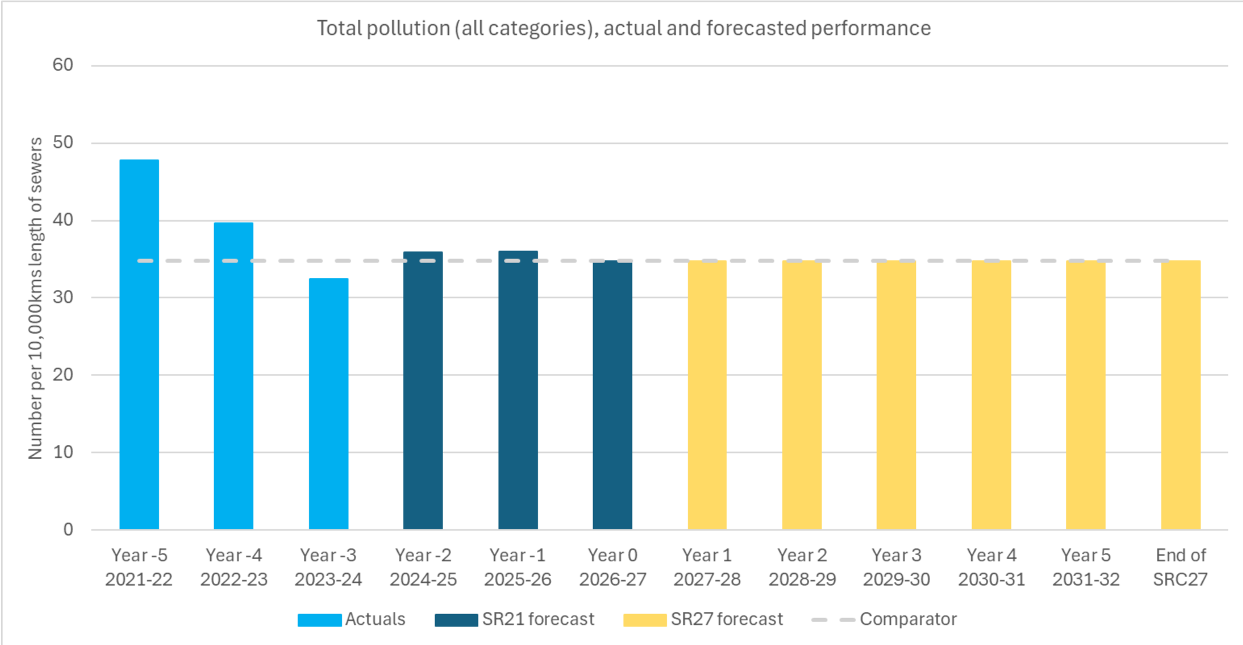
3. Service Comparisons



Serious W & WW Pollution Incidents (Cat 1&2)

Serious pollution incidents is reported as the total number of serious pollution incidents (categories 1 and 2) in a calendar year emanating from a discharge or escape of a contaminant from a water company sewerage asset or water supply asset affecting the water environment.

8.4 Total number of pollution incidents for WW only (Table 1 line 30)

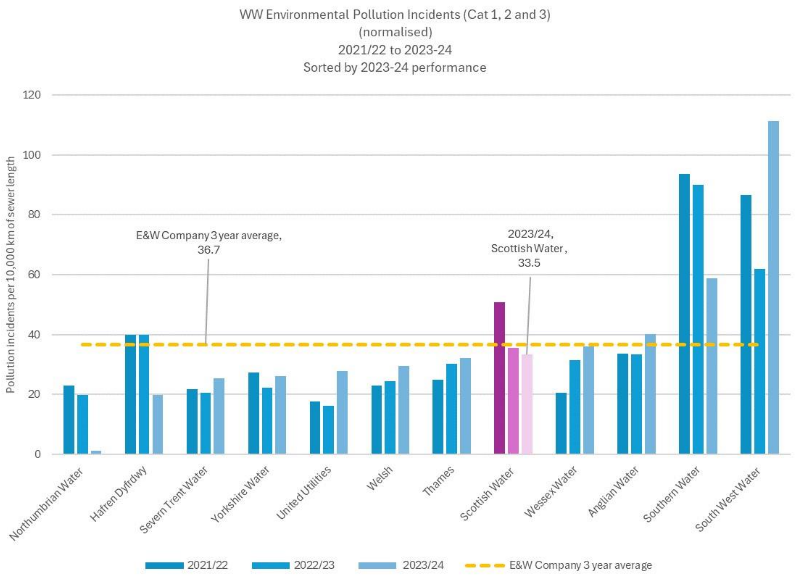
Reference	Line reference 1.30 - Total pollution incidents (all categories) - The total number of pollution incidents from a sewerage asset affecting the water environment* (Number)
Definition	Total pollution incidents are defined in the total environmental pollution incidents (EPIs) metric set out in the reporting guidance from SEPA. Total pollution incidents are reported as the total number of pollution incidents (categories 1 to 3) in a calendar year emanating from a discharge or escape of a contaminant from a sewerage asset affecting the water environment. To include Waste Water incidents only. Sewer length is defined as the total length, in kilometres, of Scottish Water's sewer network and is based on spatial data held within the corporate GIS system. This includes lateral sewers.
Plot	
Base figures	The 3-year average to 2024 forms the forecast of 36.0 for 2025. This is used as the base forecast.
Basis of projection	A 3-year rolling average is applied to forecast to 2026. The final calendar year of SR27 figure is 34.8. This figure is then held to the end of 2032, the final calendar year of SR27.

Forecast commentary to SRC45	The forecast assumes a gradual reduction to 32, 30 and 28 at the end of each subsequent regulatory periods with network monitoring. The sewer flooding register can be improved through targeted investment over the long term. This in in contrast to annual sewer flooding incidents that are forecast to increase with climate change and likely to get more volatile. The total pollution incidents in Wastewater are follow a similar upward profile from climate change but is forecast to be checked by greater asset health. In contrast, some serious pollution incidents can be more targeted through initiatives and investment.
Range of confidence for SRC27 period	The range of the 3-year average is 32.5 to 39.2 which is a 10% margin of error about the average of 36.0. B3 “B”- largely based on historic trend analysis, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. “3” is a medium level of uncertainty with a risk from climate change.
Scenarios	Scenario B and C are forecast to be the same as Scenario A as there is no change in investment
Target Suitability	A similar measure of weighted Cat 1& 2 W and WW is targeted within the current OPA. This is suitable for as a target outcome.
Target Type	The outcome is to be minimised.
Target	This is an outcome target.
Financial assumptions and dependencies	Overall investment sufficient to offset some volatility risk from aging assets and temporary solutions.
Operational assumptions	Retain existing reporting process & methodology (OFWAT comparable) EPI reporting is based on calendar year Existing sewer length methodology is used
External assumptions	The risk from weather pattern is mitigated in part.
Other assumptions	The target here lines closely with the average in England & Wales.
Additional information	Impacts from EPAS to be considered.
Development to FBP	Overall investment sufficient to offset some volatility risk from aging assets and temporary solutions.

Additional information

This historic performance is stable. Historic performance shows Scottish Water is close to the 3-year average in E&W which is just below 40incidents per 10,000 km of sewer length. There are incentives within the current OPA to maintain and improve service for the pollution incidents within this metric

3. Service Comparisons



SW Internal
General

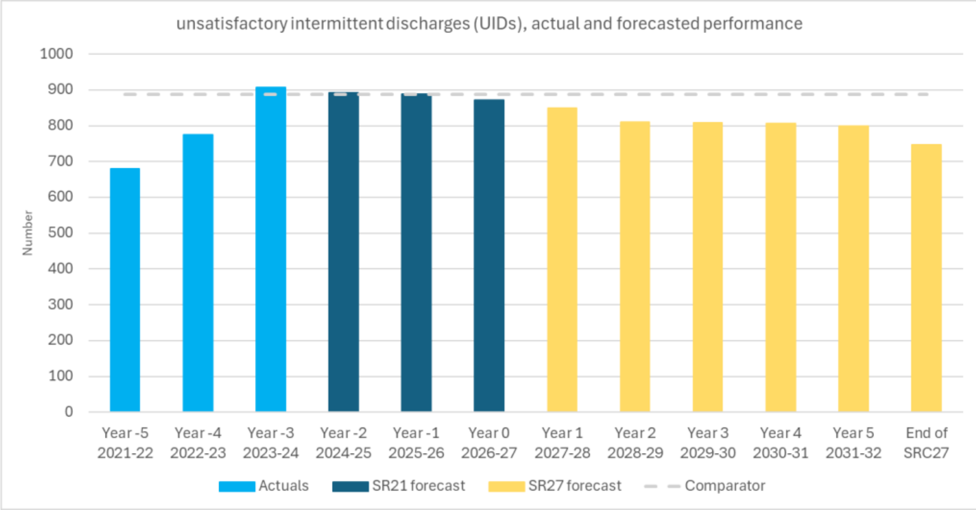
Total WW Pollution Incidents (Cat 1,2&3)

Total pollution incidents is reported as the total number of pollution incidents (categories 1 to 3) in a calendar year emanating from a discharge or escape of a contaminant from a water company **sewerage asset** affecting the water environment, per 10,000km of sewer length from wastewater assets for which the company is responsible.

8.5 Percentage of unsatisfactory sludge disposal (Table 1 line 31)

Reference	Line reference 1.31 - Sludge compliance - Percentage unsatisfactory sludge disposal (%)
Definition	Percentage unsatisfactory sludge disposal as defined in A3.28 of AR24. The percentage of sewage sludge from SW sites (PFI sites are not included) that is recycled satisfactorily (i.e. it is fully compliant) to agriculture - meeting the requirements of the Sludge (Use in Agriculture) Regulations (SUiAR).
Base figures	The 3-year average to 2024/25 is zero.
Basis of projection	The forecast assumes a maintained state relative to the average in the SRC27
Forecast commentary to SRC45	The forecast assumes a maintained state relative to the average in the SRC27
Range of confidence	B2 "B"- largely based on historic trend analysis, has been subject to outturn audit processes within current performance, has been subject to in-period forecasting and is sufficiently reliable for target outcomes. "2" is a low level of uncertainty.
Scenarios	Scenario B and C are forecast to be the same as Scenario A as there is no change in investment
Target Suitability	This is the metric in the current OPA and is suitable for a target.
Target Type	The forecast outcome is to be maintained.
Target	The forecast level is zero in Table 1.
Financial assumptions and dependencies	Assumes overall investment sufficient to offset the risk from aging assets and temporary solutions.
Operational assumptions	Assumes improvement sufficient to offset the risk from aging assets and temporary solutions and change arising from investment.
External assumptions	Assumes that the service level will be maintained through climate change.
Other assumptions	No other assumptions
Additional information	No additional information
Development to FBP	No further work is planned

8.6 Unsatisfactory intermittent discharges UIDS (Table 1 line 32)

Reference	Line reference 1.32 – Sewerage Infrastructure Discharges of UIDS
Definition	Number of UIDs (Unsatisfactory Intermittent Discharges), classified and prioritised in collaboration with SEPA.
Plot	
Base figures	The 2023/24 and 2024/25 outturn numbers are 907 and 893 respectively
.Basis of projection	The projection splits the total of 893 between Water quality impact (21) and Aesthetic impact (872). For Water quality UIDs the forecast is to reduce the 21 figure to 9 by the end of SR21 and to zero by the end of SR27. For Aesthetic UIDs the forecast is to reduce the 872 figure to 864 by the end of SR21 and to 748 by the end of SR27. For overall UIDS, the forecast is to revise the 893 figure to 873 by the end of SR21 and to 748 by the end of SR27.
Forecast commentary to SRC45	The long-term forecast is for the current list of UIDs to reduce to 550, 300 and then zero over the subsequent regulatory periods.

Range of confidence for SRC27 period	C4 - It is not yet within current performance monitoring, has received development attention and would need further development to the FBP to become sufficiently reliable for target outcomes and currently its central estimate has a high uncertainty. “C” as it is mainly through historic average, extrapolation and additional assumptions. “4” has high uncertainty as there is variation from additions relative to removals from investment from climate impact. The overall reduction is 30% from the current 907 UIDS. The outturn is at half of this level of risk and therefor I the range of 10-25% of “4”.
Scenarios	The outcome for Scenarios A and C is the same. The outcome for Scenario B is a further reduction of 40 UIDs to 708 at the end of SR27. The changes from Scenario A investment are set out in Annex D.
Target Suitability	The metric is subject to high levels of risk as a new measure which make is a potential measure for target outcomes if those risks can be mitigated.
Target Type	The outcome is to be minimised.
Target	This is suitable for a reportable outcome and potentially suitable as a target outcome subject to adequate risk mitigation.
Financial assumptions and dependencies	Assumes the planned allocation of investment in the SRC21 and SRC27 periods and the delivery profile for SR27 is spread equally, with c.150 needs developed by end of SR21.
Operational assumptions	No additional UIDs are added in SR27 and none of the c.300 “low priority” will be removed
External assumptions	No further additions from climate change factored into the long term projections.
Other assumptions	List not updated with the outcome of any further work to review to update the UIDS list through 2025.
Additional information	Unsatisfactory Intermittent Discharges (UIDs) are Combined Sewer Overflows (CSOs) that do not meet standards set out in licenses. The prioritisation approach, set out the in the Improving Urban Waters routemap and developed in collaboration with SEPA assigns a priority score to the UID, based on environmental impact. There is a significant study programme proposed for SR27, a key of this is pass forward flow in the network & treatment works. It is likely new UIDs will be identified because of this study Through further review processes some UIDs might be added or removed from the register due to better information.
Development to FBP	Update with 2024/25 outturns, updates to UIDs listing and investment allocation.

9 Net carbon emissions and biodiversity

Key Points:

- **The net zero emissions target remains a high priority in Scottish Water to 2040.**
- **The forecast reduction in net total carbon emissions is the main target but subject to many factors that are outside the direct control of Scottish Water such as the greening of the grid.**
- **The forecast reduction in this outcome over SR27 is over 60%.**

9.1 Summary

Performance measures

Most of the carbon emission related metrics on the WICS list are components in the calculation of the overall net carbon emissions outcome.

Comparator measures

There is a baseline operational carbon emissions metric comparator that is identified in the WICS list.

Excluded measures

A measure of resource recovery is not yet available. We do not have the same divers as the E&W companies for phosphorus recovery. A resource recovery measure will require much more engagement and development to ensure that it is a meaningful additional datapoint. Scottish Water notes that such a measure may be linked to the deployment of Advanced Anaerobic Digestion technology at Bioresource facilities. Scottish Water also notes that the benefits of resource recovery activities may already be captured as a reduction in carbon across operational or capital measures.

Some additional examples of areas which could be reported are as follows:

- Bioresource – methane gas which can then be used as a power source, which can be used in place of existing external power inputs (electricity) to Scottish Water.
- Recycled clothing – Scottish Water has a turnover of staff, upon leaving staff are required to return clothing and PPE which historically was sent to landfill as a waste stream. We can recycle these clothes and avoid the need to purchase as many new clothes for staff - which in turn reduces our carbon footprint.
- Chemical free treatment - achieved through changing the processes at a treatment works, and reducing or removing the need for the purchase of chemicals. This avoids the purchase of as many chemicals as would have been the case in the past.

Further engagement with WICS is required to understand the role and potential timeline involved in this type of measure.

Scottish Government Water Sector Principles

All these metrics (except for resource recovery) relate to Principle 3 which is as follows:

> *The changing climate means we are seeing more extreme weather events such as periods of very heavy and/or intense rainfall which can lead to spills from drainage systems to the environment and/or cause flooding to homes and businesses. We need to*

make greater changes in the way we manage the consequences of extreme weather events as their frequency increases.

Resource recovery relates to Principle 1 which is as follows

Water is a precious resource – it is essential for life. It supports our lives, agriculture and businesses (including distilleries and manufacturing etc.) and supports our environment. We will need to consider the water needed to water crops to maintain food supplies, or make different choices about the crops we grow, support tourism and to support new lower carbon industry, such as hydrogen production. At the same time, we must ensure we have enough water to provide drinking water supplies which are essential for public health and to protect Scotland's environment.

National Performance Framework

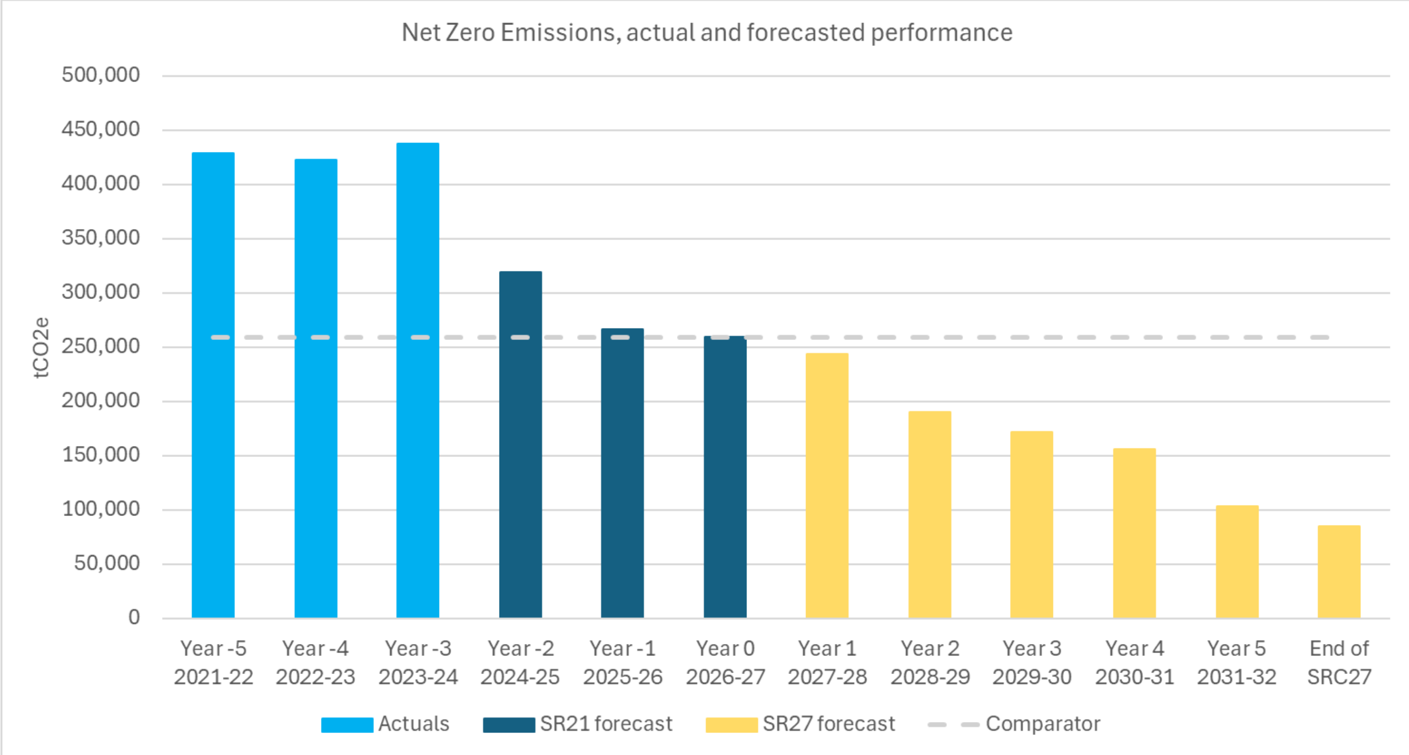
Carbon emissions is part of the National Performance Framework 'A strong competitive economy' outcome category and is on the Scottish Government's metrics list. It was identified as a key outcome to be progressed in the SRC21 business plan, and this remains so for SRC27.

Development for Final Business Plan

We will continue to develop all areas related to meeting the overall carbon emissions target for 2040, and interim emissions target for operational carbon emissions.

9.2 Net carbon emissions (Table 1 lines 34-40)

Introduction	In the Technical Appendix for Climate Change Mitigation there are three profiles for carbon emissions. The central forecast (the black line in Figure 15 of that Appendix) is used for the purpose of this submission. This forecast is based on substantive and challenging levels of change and innovation through all aspects of supply to meet lower emission levels. The elements within the WICS Table 9 set out separately and form the net zero carbon emissions projection of Table 1 line 34. As a point of note, this projection shows a net zero emissions level of 30295t CO2e in 2040 and so the target of zero emissions by 2040 would require further future innovation to be delivered beyond that assumed in this profile. Net Zero emissions is an ambitious goal with extensive external dependencies such as the greening of the grid and Scotland's decarbonisation pathway. Whilst challenging, Scottish Water anticipates that, in line with its net zero emissions route map, innovation in wastewater process emissions, carbon capture, and capital investment within SR27 will offer further opportunities to meet the ambition, as will working across wider water catchments to further increase land carbon benefits. The information also includes the percentage reduction in operational emissions compared to the 2006-07 baseline of Table 1 line 27.

Overall plot of net zero emission reduction over SR27	

Line by line definition and basis of projections

Line reference	Measure of Level of Service	Level of Service	Unit	Related line in AR tables	Comments	SW SR27 Definition	Definition from AR related line
1.34	Net Zero Emissions	Net Zero Emissions	tCO2e	C1.29 plus Average (C2.4, C2.5) minus C4.10	This line equals the total of lines 1.35+1.36+1.39+1.40	Net emissions are reported as the balance between operational and capital investment emissions, and carbon captured using the latest available data and emission factors in each reporting year.	C1.29 - Total net operational emissions (includes SW & PFI). Gross emissions plus carbon credit from exported renewables. C2.4 & C2.5 - Carbon emissions from capital investment high & low estimates for reporting year. AR25 should be a single figure to replace C2.4&C2.5. C4.10 - Total emissions from landholdings in year taken from James Hutton Institute model.
1.35	Operational emissions	Operational emissions (water)	tCO2e	C1.29 (net)	Only total of water and wastewater reported currently but can be reported separately easily (C0.4 is the same number pulled forward).	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) associated with water infrastructure. Reported actual data will reflect the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW) factors.	C1.29 - Net operational emissions (scope 1, 2 & 3). Measurement of gross annual operational emissions of the regulated business including SW and PFIs.
1.36	Operational emissions	Operational emissions (wastewater)	tCO2e	C1.29 (net)	Only total of water and wastewater reported currently but can be reported separately easily (C0.4 is the same number pulled forward).	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) associated with wastewater infrastructure. Reported actual data will reflect the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW) factors.	C1.29 - Net operational emissions (scope 1, 2 & 3). Measurement of gross annual operational emissions of the regulated business including SW and PFIs.
1.37	Operational emissions	Percentage reduction in operational emissions compared to 2006-07 baseline	%	C1.35 (net)	(1.35+1.36)/462000x100	The percentage reduction in Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) compared to 2006-07 baseline. Relevant emissions are calculated using the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW).	C1.35 - Percentage reduction of the net operational footprint of the regulated business from 2006/07 baseline (net) to the current reporting year.
1.38	Operational emissions	Operational emissions (net emissions)	tCO2e	C0.9 (net of insetting and offsetting)	This line equals the total of lines 1.35+1.36+1.40 Like for like with OFWAT definition linked with Carbon Accounting Workbook but variations may occur around Carbon Capture metric with England and Wales	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) net of insetting and offsetting. Relevant emissions are calculated using the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW).	C0.9 - Net operational emissions net of insetting and offsetting (closing). Net operational emissions in report year plus total CO2e from landholdings in report year.

Continued

Line reference	Measure of Level of Service	Level of Service	Unit	Related line in AR tables	Comments	SW SR27 Definition	Definition from AR related line
1.39	Climate change mitigation	Investment emissions	tCO2e	Average of C2.4 and C2.5 In AR25 this will be a single figure	In AR25 this will be a single figure	Measurement of Scottish Water's investment emissions is calculated by taking the current year carbon intensity figures and multiplying by the total investment expenditure. This approach provides total investment emission as a figure in tCO2e.	C2.4 & C2.5 - Carbon emissions from capital investment high & low estimates for reporting year.
1.40	Climate change mitigation	Carbon capture/sequestration	tCO2e	C4.10	Alternatively, C0.7 (this is the same number pulled forward)	Carbon captured or lost is reported as tonnes CO2e and expressed as the midpoint of a range given the uncertainty.	C4.10 - Total emissions from landholdings in year taken from Hutton model.

Line by projection and other assumptions

Line reference	Measure of Level of Service	Level of Service	Unit	Projection assumptions	Other assumptions	Suitability for target outcomes
1.34	Net Zero Emissions	Net Zero Emissions	tCO2e	This is the summation of lines below	This is subject to factors outside of Scottish Water's control	This is the 2040 outcome target measure. Its suitability for target outcome needs to take account of the dependency on factors outside of Scottish Water's control.
1.35	Operational emissions	Operational emissions (water)	tCO2e	This measure is primarily affected by the grid greening and associated emission factor from Dept of Energy Security and Net Zero It includes leakage management delivering 11 GWh We progress up to 25GWh energy efficiency or onsite renewables by 2033 (reduction from planned investment) with the 90 GWh on-site renewable target in long term strategy no longer possible with funding available We take account of the design and implementation of low energy treatment processes, energy efficiency, on-site renewables and fleet decarbonisation.	Weather is risk factor – e.g. drought will drive increased consumption of electricity SR27 treatment enhancements is not assumed to increase electricity demand The carbon accounting workbook (CAW) boundary is assumed not expanded to include chemicals The electricity grid decarbonises in line with the expected profile meaning emissions are higher	Line 1.34 is our target outcome metric
1.36	Operational emissions	Operational emissions (wastewater)	tCO2e	As for line 1.35 plus, Unlike water this measure is also strongly affected by process emissions There is a significant dependency on the Bioresource Strategy (80GWh renewable energy generation and gas and process emission reduction (20,000 tCO2e)	As for line 1.35 plus SR27 treatment and network enhancements does not increase electricity demand	Line 1.34 is our target outcome metric
1.37	Operational emissions	Percentage reduction in operational emissions compared to 2006-07 baseline	%	Operational Net Zero is forecast to be reached by 2034/35 The benefit of new hosted renewables where SW retains and retires Renewable Energy Guarantees of Origin (REGOs) certificates is reflected in an export carbon credit to the grid and netted off the electricity emissions reported	As for line 1.36.	Line 1.34 is our target outcome metric
1.38	Operational emissions	Operational emissions (net emissions)	tCO2e			

Continued

Line reference	Measure of Level of Service	Level of Service	Unit	Projection assumptions	Other assumptions	Suitability for target outcomes
1.39	Climate change mitigation	Investment emissions	tCO_2e	Measurement of Scottish Water's investment emissions is calculated by taking the carbon intensity figures in the year (tCO_2e) and multiplying by the total investment expenditure. This approach provides total investment emissions as a figure in tCO_2e. For the purposes of the business plan, this means that: • a 2023-24 price base will be used for preparing investment emission forecasts for the draft business plan; and • a 2024-25 price base will be used for preparing investment emission forecasts for the final business plan.	The costs to address investment emissions is 3% of the programme and is not built into the SR27 cost for the programme We have included high levels of design, material and technology innovation, but even more would be needed to meet the net zero emissions outcome for 2040 than we have made in this forecast.	Line 1.34 is our target outcome metric
1.40	Climate change mitigation	Carbon capture/sequestration	tCO_2e	Carbon captured or lost is reported as tonnes CO_2e and expressed as the midpoint of a range given the uncertainty. Land carbon capture remains a new and developing area with significant uncertainty. We anticipate further factor and accounting method changes in woodland, peatland, soil and other forms of land cover. Status of land carbon inventory – balance of losses from peatland, poorly maintained grassland etc and gains in woodland, soil and other land cover types will be assessed 3-yearly by external land experts	We restore 500 ha of poor-quality peatland assuming land access and tenancies permits, and peatland recovery meets expectations c. 4000 ha woodland creation (natural regeneration and planting) delivered assuming land access and tenancies permitting Loch Katrine land management plan progresses as planned More stringent Environmental Impact Assessments will be required for woodland owing to current pressures, but we will secure Scottish Forestry regulatory approval and their co-funding to progress planned projects in SR27 Peatland restoration continues to be supported and co-funded through Peatland Action	Line 1.34 is our target outcome metric

9.3 Biodiversity land use (line 41)

Reference	Line reference 1.41 - Climate change mitigation - Biodiversity and Nature Based Solutions (interim measure) (land footprint (hectares))
Definition	Change in hectares of land through planting, natural generation and restoration of peatland and adoption of blue-green approaches
Plot	n/a
Base figures	Assuming a base of zero in 2023/24 to count then change in the period 2024/25 to 2032/33.
Basis of projection	As such areas of focus in the business plan from 2024/25 to 2032/33 that may contribute to this outcome are: • c.1,000 hectares of woodland through planting. • c. 3,000 hectares through planting and natural regeneration (Loch Katrine). • c. 500 hectares through restoration of residual peatland. • continued adoption of blue-green approaches. In addition, we will continue to progress the adoption of biodiversity-supporting land management practices across its operational sites and to deliver more biodiversity gain through its capital programme.
Forecast commentary to SRC45	We have not provided a long-term forecast. We expect the focus of biodiversity to move from this measure to an outcomes measure beyond 2033.
Range of confidence	DX- The source of information indicates the available definition would not be suitable for a target outcome (e.g. inputs or speculative). In this case it is an input metric. a part of the forecast is based primarily on the Loch Katrine 10-year plan which is subject to inputs that are outside of the control of Scottish Water.
Scenarios	The outcomes for Scenarios B and C are assumed to be the same as for scenario A on the basis that the expected investments in the same.
Target Suitability	This is a metric that acknowledges a change in land use that supports improved biodiversity and may include biodiversity improving measures (e.g. improved site management) or nature-based options to support service (e.g. catchment management, carbon capture, flooding) to meet this requirement. This is an input-based approach to reporting - i.e. the work undertaken each year in land use change/biodiversity improvement. For this, we undertake 3-yearly assessments of its land inventory for biodiversity and natural capital. This forms the principal basis for reporting, published under the Nature conservation Act. This is reflected in the WICS Outcome Table 1 line 41.

	Scottish Water is presently working with NatureScot to pilot a further means to assess the status of biodiversity management. The Scottish Biodiversity Strategy sets an aspiration that 30% of Scotland's land (excluding statutory protected sites) is managed for biodiversity by 2030 (and 40 by 2040). These sites are termed "Other Ecological Conservation Measure" sites and Scottish Water is testing NatureScot's method on its sites. Through this we expect to develop a view of the % of Scottish Water land managed positively for nature. We would expect to report this in our 2026 Biodiversity Report. The metric is thought best to be used for reporting rather than outcome targets because the progress of change to land is dependent on permissions being granted for alternative use of land and government policy and initiatives.
Target Type	The outcome is to be maximised.
Target	Reporting outcome rather than target outcome primarily as it is an input metric.
Financial assumptions and dependencies	Financial resources for this will depend on government initiatives and policies towards carbon emissions and biodiversity/
External assumptions	Change to land is dependent on permissions being granted for alternative use of land and government policy and initiatives.
Additional information	**Types of initiatives:** Scottish Water is working to improve biodiversity through several types of initiative: • **Water Quality and resilient catchments:** Landscape initiatives such as peatland restoration, riparian habitat management, woodland creation and sustainable land management are aimed at reducing risk to source water quality and may include measures such as peatland restoration, improved riparian buffer strips and habitat restoration. They will generally be of relatively large scale – tens to hundreds of hectares and will deliver significant biodiversity gain. Examples include Loch Katrine Land Management Plan, Afton Peatland restoration etc • **Carbon capture to support net zero:** Woodland creation takes place at several scales from small operational sites (e.g. Shotts), to medium sized tenant farms (West Feal, Middle Coul) to large scale (Loch Katrine). They range from <5 hectares to >1,000 hectares (Katrine will see c.4,600 hectares of woodland established) and will deliver carbon, landscape resilience and biodiversity outcomes. Some of the woodland creation includes commercial forestry – this will deliver some biodiversity gain but less than native. • **Blue-green infrastructure:** natural flood management and sustainable drainage tends to be associated with more urban locations. To date it has been relatively small scale (tens to hundreds of square metres) of constructed wetland, natural drainage or urban soakaways, but delivers a significant benefit in the resilience of urban spaces. There biodiversity gain will depend on the type of habitat created and its location.

	• **Nature Based Solutions:** Technologies such as wetland treatment systems can offer some biodiversity benefit as well as being a generally lower carbon (operational carbon) solution – generally tens to hundreds of square metres in scale. • **Around water bodies:** Quality drivers around biodiversity would be promoted through SEPA, supported by input from NatureScot and would be part of the water (e.g. abstraction, compensation) and environment (discharge requirements) teams. Outcomes may be improvements in km of water body etc • **Work sites:** Scottish Water operates hundreds of sites with varying amounts of greenspace. Learning outcomes from the pilot work will see a wider adoption of biodiversity supporting management practices – maintenance and management to promote biodiversity across these sites. This will range from tens to hundreds of square metres for most sites but will give a significant aggregate gain in the area managed positively for biodiversity, contributing the Scottish Government's strategy.
Development to FBP	The focus will be the continued progress of the implementation of biodiversity and development of the biodiversity outcomes metric. Nevertheless, this metric can be useful to report progress through inputs.

5 Annex A: Scenarios B and C

This Annex set out the variation in Expenditure from Scenario A for Scenarios B and C.

Scenario B

Recommendation	£430m	
Secure Water Quality compliance (including Water NIS compliance risk)	£225m	• AR3 expenditure on critical chemical dosing & control equipment and network interventions to avoid discoloration. • Replacement of Castle Moffatt WTW: AR3, HAA, and Disinfection needs • Improved water quality monitoring at WTW to improve assurance manage operational problems.
Protect internal sewer flooding performance in a changing climate	£80m	•Investment to de-risk central output profile and move messaging from "maintain" to "reduce".
Promote community -driven, place -based schemes that keep rainwater on the surface	£65m	•Community fund to seed partnership work, (inc. with Local Authorities). •Strong alignment with LTS outcomes and steps.
Further progress on UIDs with environmental impact	£60m	•Begin to deliver some improvements to medium priority UIDs.
Other Options (excluded)	**£175m**	
Begin to introduce domestic monitors with NHH smart meter roll -out	£40m	•Rationale to wait for Dundee pilot
Faster progress on Supply -Demand balance	£70m	•Secures resilience of water resource to East Lothian

Note: Prices: 23/24; pre - SR27 efficiency adjustment

Scenario C

Recommendation	-£420m	
Delay addressing the causes of problems for future customers, introducing more volatility into today's service levels	-£100m	Reduce distribution mains renewal to 250km/yr • Full AC replacement extended by 5 years. • Recurring Customer Interruptions stable, not reducing. • ITS & burst rates volatile and continuing to trend upward.
	-£80m	No allocation for emerging demand on WWTW from future connections • Requires higher WLC temporary operational solutions or putting at risk future Environmental Compliance
	-£25m	No expenditure on new renewables • Requires significant investment in SR33 to hit Net Zero by 2040
Pause investment in intelligence for good - practice asset management	-£85m	Circa 50% reduction in planned non-statutory inspections • Weaker evidence base for future planning – remaining inspections later in the period. • Potential to miss some low-probability high-impact issues.
Different approach to internal sewer flooding	-£130m	Provide property-level mitigations, prioritising traditional solutions only where there is a high cost-benefit and no prospect of a strategic solution (inc. rainwater management). • Flooding register likely to rise by 200+ properties during SR27

Other Options (excluded)	-£175m	
No investment in External Flooding or new drainage partnerships	-£40m	Strong incongruence with LTS and SR27 methodology focus on rainwater management and partnerships.
Less progress on Water Quality expectations	-£65m	Interim work only at Glendevon and Camphill WTWs • Significant risk of Enforcement action is unsuccessful
NHH Smart Metering roll -out paused	-£65m	NHH Smart Metering delayed to SR33 • Opportunity cost of 25-40 Ml/d leakage • Potential impact on non -household revenue • Higher WLC demonstrated in St3A Project Investment Appraisal

SW Internal
Commercial

Note: Prices: 23/24; pre - SR27 efficiency adjustment

6 Annex B: Mapping of each line to the National Performance Framework

	Short description of measure	*Strategic Category*	*Alignment to Scottish Governments National Performance Framework*
1.01	dCEM Developer Customer Experience Measure	Customer	Communities
1.02	nhCEM Non Household Customer Experience Measure	Customer	Communities
1.03	R-MeX Retailer Experience Measure	Customer	Communities
1.04	hCEM Household Customer Experience Measure	Customer	Communities
1.05	UKCSI UK customer Satisfaction Index	Customer	Communities
1.06	Communities measure		
1.07	Percentage reduction of three-year average leakage*	Water Continuity	Economy - Environment
1.08	Leakage reduction in areas with supply-demand balance deficit*	Water Continuity	Economy - Environment
1.09	Percentage reduction of consumption at non-household premises*	Water Continuity	Economy - Environment
1.10	Three-year average per capita consumption*	Water Continuity	Economy - Environment
1.11	Number of properties on the low pressure register	Water Continuity	Economy - Health
1.12	Unplanned interruptions greater than 6 hours, excluding 3rd party	Water Continuity	Economy - Health
1.13	Average minutes lost due to water supply interruptions (over 3 hours)*	Water Continuity	Economy - Health
1.14	Repeat interruptions to water supply	Water Continuity	Economy - Health
1.15	Customers supplied by systems not capable of meeting demand during a worst historic drought	Water Continuity	Economy - Health
1.16	Customers supplied by systems not capable of meeting peak demand	Water Continuity	Economy - Health
1.17	Taste and odour contacts*	Wate Quality	Health
1.18	Discolouration and aeration contacts*	Wate Quality	Health
1.19	Estimated number of lead pipes remaining in public network	Wate Quality	Health
1.20	Indicator of lead in customers supply pipes	Wate Quality	Health
1.21	Total drinking water compliance	Wate Quality	Health

	Short description of measure	*Strategic Category*	*Alignment to Scottish Governments National Performance Framework*
1.24	Number of internal sewer flooding incidents*	Wastewater Flows	Health - Communities - Environment
1.22	Drinking water quality risks across all systems above long-term tolerable threshold. (Share of SW served population with unsatisfactory risk at the tap in WRAP)	Wate Quality	Health
1.23	Number of DWQR declared incidents	Wate Quality	Health
1.25	Number of properties at risk of internal flooding	Wastewater Flows	Health - Communities - Environment
1.26	Number of external sewer flooding	Wastewater Flows	Health - Communities - Environment
1.27	Number of properties at risk of external flooding	Wastewater Flows	Health - Communities - Environment
1.28	Percentage compliance with SEPA discharge permits	Water Environment	Communities - Environment
1.29	Number of serious pollution incidents* (W & WW)	Water Environment	Communities - Environment
1.30	The total number of pollution incidents from a sewerage asset affecting the water environment* (WW only)	Water Environment	Communities - Environment
1.31	Percentage unsatisfactory sludge disposal	Water Environment	Communities - Environment
1.32	[Measure(s) to be proposed] UIDS	Water Environment	Communities - Environment
1.33	[Measure(s) to be proposed] River quality		
1.34	Net Zero Emissions	Climate change mitigation	Economy - Environment
1.35	Operational emissions (water)	Climate change mitigation	Economy - Environment
1.36	Operational emissions (wastewater)	Climate change mitigation	Economy - Environment
1.37	Percentage reduction in operational emissions compared to 2006-07 baseline	Climate change mitigation	Economy - Environment
1.38	Operational emissions (net emissions)	Climate change mitigation	Economy - Environment
1.39	Investment emissions	Climate change mitigation	Economy - Environment
1.40	Carbon capture/sequestration	Climate change mitigation	Economy - Environment
1.41	Biodiversity and Nature Based Solutions (interim measure)	Climate change mitigation	Economy - Environment
1.42	Biodiversity and Nature Based Solutions (final measure)		
1.43	Resource recovery		
1.44	Asset health	Asset repair, refurbishment, replacement	Economy

7 Annex C: Confidence grades for each line

Whilst not a requirement in the WICS guidance, to provide further colour on our forecasts of outcomes over SR27 we have incorporated the WICS guidance on confidence grades that has been used in other parts of the Business Plan Data Tables submissions for SR27 and applied it to the outcomes in Data Table 1. The confidence grade for each line in Table 1 and their meaning is set out below.

List ref	Short title	Grade	List ref	Short title	Grade
1.01	dCEM	B3	1.24	Annual internal sewer flooding	C5
1.02	nhCEM	B3	1.25	Internal sewer flooding register	C4
1.03	R-MeX	C3	1.26	Annual external sewer flooding	C5
1.04	hCEM	B3	1.27	External sewer flooding register	C5
1.05	UKCSI	C3	1.28	WwTW compliance	B3
1.06	Communities	-	1.29	Serious pollution (EPI Cat 1/2)	B3
1.07	Total leakage	B3	1.30	Total pollution (all categories)	B3
1.08	Zonal leakage	C3	1.31	Sludge compliance	B2
1.09	Business demand	D3	1.32	Unsatisfactory intermittent discharges (UIDs)	C4
1.10	Per capita consumption (PCC)	C4	1.33	River water quality	-
1.11	Low pressure	B3	1.34	Net Zero Emissions	C3
1.12	Unplanned interruptions	B3	1.35	Operational emissions (W)	B3
1.13	Minutes lost	D3	1.36	Operational emissions (WW)	B3
1.14	Repeat ITS	C4	1.37	Baseline emissions	B3
1.15	Worst historic drought	D4	1.38	Operational emissions (net)	B3
1.16	Peak demand	D5	1.39	Embodied carbon	C3
1.17	Taste & odour	C3	1.40	Carbon capture/sequestration	C3
1.18	Discoloration	C3	1.41	Biodiversity land-use	DX
1.19	Lead SW networks	C3	1.42	Biodiversity outcomes	-
1.20	Lead customer pipes	D4	1.43	Resource recovery	-
1.21	Drinking water compliance	B3	1.44	Asset health	-
1.22	WRAP	C4			
1.23	DWQR reported incidents	C4			

Reliability Band	WIC Description	SW level of reliability and state of readiness for use in target outcomes
A	Sound textual records, procedures, investigations or analysis properly documented and recognised as the best method of assessment.	Excluded as we have none that are robustly forecast from an audit process viewpoint.
B	As A, but with minor shortcomings. Examples include old assessment, some missing documentation, some reliance on unconfirmed reports, some use of extrapolation.	Those subject to outturn audit processes within current performance, have been subject to in-period forecasting and are considered to be sufficiently reliable for target outcomes
C	Extrapolation from limited sample for which Grade A or B data is available.	Those that are not yet within current performance monitoring, have received development attention and could developed further to become sufficiently reliable for target outcomes.
D	Unconfirmed verbal reports, cursory inspections or analysis.	Those that are not considered to be sufficiently reliable or suitable for target outcomes.

Accuracy Band	Accuracy Range	Uncertainty in the forecast values
1	Less than +/- 1%	Very low
2	+/- 5% to +/- 1%	Low
3	+/- 10% to +/- 5%	Medium
4	+/- 25% to +/- 10%	High
5	+/- 50% to +/- 25%	Very high
6	Greater than +/- 50%	Extremely high
X	Accuracy outside +/- 100 %, zero or small numbers or otherwise incompatible	

Accuracy Bands	Reliability Band			
	A	**B**	**C**	**D**
1	A1			
2	A2	B2	C2	
3	A3	B3	C3	D3
4	A4	B4	C4	D4
5			C5	D5
6				D6

8 Annex D: Definitions of each line

Reference	Measure of Level of Service	Level of Service	Unit	Definition with notes
1.01	CEM	dCEM Developer Customer Experience Measure	Number	The Developer Customer Experience Measure (dCEM) score.
1.02	CEM	nhCEM Non Household Customer Experience Measure	Number	As currently defined in MCL 3759 Non Household Customer Experience Definition Document – Version C. Note: Scottish Water values the insight and trends that it receives from the nhCEM and will continue to track the established metrics as a means to understand how SW is delivering improvements in services for the business and LP community. However, we have now established the R-mex as a bi-annual survey, in full alignment with the Ofwat programme and publication of performance to allow benchmarking of wholesale services.
1.03	CEM	R-MeX Retailer Experience Measure	Number	Survey of retailers (licensed providers) regarding their experience of service levels from Scottish Water as wholesaler. Mirrors MOSL's bi-annual RMeX survey in England. Conducted by external partner on Scottish Water's behalf in liaison with MOSL to ensure alignment.
1.04	CEM	hCEM Household Customer Experience Measure	Number	Household Customer Experience Measure (hCEM) Definition Document 1 Version 4 Note: Scottish Water is keen to maintain the hCEM in its current form, it has provided invaluable insight and sits at the heart of a number of service excellence improvements delivering benefits to customers. Maintaining the measure as it is provides a clear line of sight on performance improvements. We will always take time to consider fully potential changes that could be required with regards to the hCEM, which has evolved since it was first introduced in 2015. It was not felt that a change in the survey scale, which was requested would have any material benefit to customers therefore on this occasion will not progress, however, it would be a simple process to adjust the scale for reporting purposes if this was required.
1.05	CEM	UKCSI UK customer Satisfaction Index	%	The UK Customer Satisfaction Index (UKCSI) is the national barometer of customer satisfaction published twice a year by The Institute of Customer Service since 2008. It is an independent, objective benchmark of customer satisfaction on a consistent set of measures on 282 organisations and organisation types across 13 sectors. The SW score is determined in a benchmark survey undertaken by UKCSI.
1.06	CEM	Communities experience measure		n/a

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.07	Leakage	Percentage reduction of three-year average leakage*	%	The percentage reduction of three-year average leakage from a 2024-25 baseline (i.e AR23/AR24/AR25 inclusive). Three-year average values are calculated from annual average values for the reporting year and two preceding years and expressed in Ml/d. All values reported as a post-Maximum Likelihood Estimation (MLE) figure. Annual average leakage is defined as the sum of distribution system leakage, including service reservoir losses, trunk main leakage, and customer supply pipe leakage.
1.08	Leakage	Leakage reduction in areas with supply-demand balance deficit*	%	The percentage reduction of three-year average leakage from a 2024-25 baseline (i.e AR23/AR24/AR25 inclusive) for zones defined as being in supply demand deficit in year 2024/25. Three-year average values are calculated from annual average values for the reporting year and two preceding years and expressed in Ml/d. All values reported as a post-Maximum Likelihood Estimation (MLE) figure. Annual average leakage is defined as the sum of distribution system leakage, including service reservoir losses, trunk main leakage, and customer supply pipe leakage.
1.09	Business demand	Percentage reduction of consumption at non-household premises*	%	The percentage net reduction of three-year average business demand in mega-litres per day (Ml/d) from a 2024-25 baseline. Three-year average values are calculated from annual average values for the reporting year and two preceding years expressed in Ml/d. Non-household premises include businesses, charities and public sector organisations.

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.10	Per capita consumption (PCC)	Three-year average per capita consumption*	l/person /d	The three-year average PCC in litres per person per day (l/person/d). Three-year average values are calculated using annual average per household consumption (PHC) values from unmeasured household use for the reporting year and two preceding years expressed in l/person/d. This will be based on calendar year to align with other elements of the annual water balance. Reporting will begin from January 2027.
1.11	Customers receiving low pressure	Number of properties on the low pressure register	Number	The total number of properties on the low pressure register at the end of the year.
1.12	Unplanned interruptions	Unplanned interruptions greater than 6 hours, excluding 3rd party	Number	The number of properties that have experienced an unplanned water supply interruption. The calculation uses the number of properties affected by interruptions lasting between 6 and 12 hours, between 12 and 24 hours, and over 24 hours, with respective weightings of 1, 2 and 4. There are no exclusions, except for Third Party events, and includes weather-related and health and safety concern incidents.
1.13	Planned and unplanned interruptions	Average minutes lost due to water supply interruptions (over 3 hours)*	Minutes	Average supply interruption greater than three hours (minutes per property) as reported in AR24 B2.25. The average number of minutes lost per customer for the whole customer base for interruptions that lasted three hours or more. Output should be presented as average minutes lost. Calculation of performance is carried out using the following equation: $((Properties\ with\ interrupted\ supply \geq 180\ mins) \times Full\ duration\ of\ interruption)\ Total\ number\ of\ properties\ supplied\ (year\ end)$ = average number of minutes lost per customer. Note that this includes planned and unplanned ITS, and third party ITS.

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.14	Unplanned interruptions	Repeat interruptions to water supply	Number	The number of postcodes with repeat contacts of either • ≥ 6 property contacts within 1 year • ≥ 10 property contacts within 3 years. This equates to a given postcode reaching at least threshold level 4
1.15	Water availability	Customers supplied by systems not capable of meeting demand during a worst historic drought	Number	Population of customers supplied by systems not capable of meeting demand during a worst historic drought. Definition includes: • Worst Historic Drought (assumed 1:150) • Climate change adjustments would be made in line with climate adaptation plan. • the use of documented drought measures.
1.16	Water availability	Customers supplied by systems not capable of meeting peak demand	Number	Population of customers supplied by systems not capable of meeting peak demand Definition is based on: • peak period against WTW capacity and CAR licence (both summer and winter) • not considered peak network constraints • allows for Scottish Water tankering policy.

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.17	Drinking water aesthetics	Taste and odour contacts*	Number	The number of times customers contact the company due to the taste and odour of drinking water reported per 1,000 /10,000 (DWQR & WICS to confirm) population. The calculation is the number of contacts for all taste and odour contacts multiplied by 1,000 divided by the resident population as reported to the Drinking Water Quality Regulator (DWQR).
1.18	Drinking water aesthetics	Discolouration and aeration contacts*	Number	The number of times customers contact the company because the drinking water is not clear is reported per 1,000 /10,000 (DWQR & WICS to confirm) population. The calculation is the number of contacts for all appearance contacts multiplied by 1,000 divided by the resident population as reported to the Drinking Water Quality Regulator (DWQR). It includes aeration.
1.19	Drinking water quality	Estimated number of lead pipes remaining in public network	Number	Estimated number of lead pipes remaining in public network.
1.20	Drinking water quality	Indicator of lead in customers supply pipes	%	Percentage of random daytime regulatory samples with lead levels not greater than 3 µg/l
1.21	Drinking water quality	Total drinking water compliance	%	Total Water Quality compliance as reported in DWQR including samples at taps, service reservoirs and treatment works. Current definition is based on regulatory samples across all asset base – zones to use baseline sampling - including Cryptosporidium (non-UV irradiated). Detailed methodology to be agreed with DWQR for the Final Business Plan. Test volatility of risk based zonal sampling to confirm impact if any before Jan 2027. If low impact, we will add risk zonal samples into the measure.
1.22	Drinking water quality	Drinking water quality risks across all systems above long-term tolerable threshold.	Number	The number of WQ WSZ & Hazard Pairs above long-term tolerable threshold (including those considered significant), based on thresholds of 42 from WRAP using likelihood x consequence.
1.23	Drinking water quality	Number of DWQR declared incidents	Number	The number of all Significant, Serious and Major events declared by DWQR for the calendar year.

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.24	Internal sewer flooding	Number of internal sewer flooding incidents*	Number	The number of internal sewer flooding incidents due to Scottish Water assets, including incidents where assets were overwhelmed by severe weather events, per 10,000 sewer connections. The number of internal sewer flooding incidents due to Scottish Water assets, including incidents where assets were overwhelmed by severe weather events, per 10,000 sewer connections. This measure includes flooding due to overloaded sewers (hydraulic flooding-FOS) and due to other causes (Flooding Other Causes - FOC). For the purpose of this outcome measure, a flooding incident means the total number of properties flooded during each flooding event from a Scottish Water sewer. The forecast provided in the business plan includes all flooding incidents including those due to severe weather.
1.25	Internal sewer flooding	Number of properties at risk of internal flooding	Number	The number of properties at risk of internal sewer flooding incidents per 10,000 sewer connections.
1.26	External sewer flooding	Number of external sewer flooding	Number	The number of external sewer flooding incidents due to Scottish Water assets, including incidents where assets were overwhelmed by severe weather events, per 10,000 sewer connections. This measure includes flooding due to overloaded sewers (hydraulic flooding) and due to other causes (Flooding Other Causes - FOC). For the purpose of this outcome measure, a flooding incident means the total number of areas flooded during each flooding event from a Scottish Water sewer. It includes all areas inside and outside property curtilage and areas such as roads, highways, and public amenities. The forecast provided in the business plan includes all flooding incidents including those due to severe weather.
1.27	External sewer flooding	Number of properties at risk of external flooding	Number	The number of areas at risk of external sewer flooding incidents per 10,000 sewer connections. This measure is a count of the number of areas on the external at risk register and is based on current Annual Return methodology.

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.28	Discharge Permit Compliance	Percentage compliance with SEPA discharge permits	%	Percentage of wastewater treatment works (WwTWs) complying with their Scottish Environment Protection Agency (SEPA) discharge permit requirements.
1.29	Serious pollution incidents (EPI Cat 1/2)	Number of serious pollution incidents*	Number	The number of serious environmental pollution incidents (EPIs) categorised as 1 and 2 as set out in the reporting guidance from SEPA during calendar year, emanating from a discharge or escape of a contaminant from a water company sewerage asset or water supply asset affecting the water environment. To include Water and Waste Water incidents.
1.30	Total pollution incidents (all categories)	The total number of pollution incidents from a sewerage asset affecting the water environment*	Number	Total pollution incidents are defined in the total environmental pollution incidents (EPIs) metric set out in the reporting guidance from SEPA. Total pollution incidents are reported as the total number of pollution incidents (categories 1 to 3) in a calendar year emanating from a discharge or escape of a contaminant from a sewerage asset affecting the water environment. To include Waste Water incidents only Sewer length is defined as the total length, in kilometres, of Scottish Water's sewer network and is based on spatial data held within the corporate GIS system. This includes lateral sewers.
1.31	Sludge compliance	Percentage unsatisfactory sludge disposal	%	Percentage unsatisfactory sludge disposal as defined in A3.28 of AR24. The percentage of sewage sludge from SW sites (PFI sites are not included) that is recycled satisfactorily (i.e. it is fully compliant) to agriculture - meeting the requirements of the Sludge (Use in Agriculture) Regulations (SUiAR).
1.32	Sewerage infrastructure discharges	Number of UIDS	Number	Number of UIDs (Unsatisfactory Intermittent Discharges), classified and prioritised in collaboration with SEPA.
1.33	River water quality			n/a

Reference	Measure of Level of Service	Level of Service	Unit	Definition
1.34	Net Zero Emissions	Net Zero Emissions	tCO2e	Net emissions are calculated as the balance between operational and capital investment emissions, and carbon captured using the latest available data and emission factors in each reporting year.
1.35	Operational emissions	Operational emissions (water)	tCO2e	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) associated with water infrastructure. Reported actual data will reflect the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW) factors.
1.36	Operational emissions	Operational emissions (wastewater)	tCO2e	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) associated with wastewater infrastructure. Relevant emissions are calculated using the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW).
1.37	Operational emissions	Percentage reduction in operational emissions compared to 2006-07 baseline	%	The percentage reduction in greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) compared to the 2006-07 baseline. Relevant emissions are calculated using the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW).
1.38	Operational emissions	Operational emissions (net emissions)	tCO2e	Greenhouse gas emissions expressed in tonnes CO2e (carbon dioxide equivalent) net of insetting and offsetting. Relevant emissions are calculated using the latest UK Water Industry Research Ltd (UKWIR) Carbon Accounting Workbook (CAW).
1.39	Climate Change Mitigation	Investment emissions	tCO2e	Measurement of Scottish Water's investment emissions is calculated by taking the current year carbon intensity figures and multiplying by the total investment expenditure. This approach provides total investment emission as a figure in tCO2e.
1.40	Climate Change Mitigation	Carbon capture/sequestration	tCO2e	Carbon captured or lost is reported as tonnes CO2e and expressed as the midpoint of a range given the uncertainty.
1.41	Climate Change Mitigation	Biodiversity and Nature Based Solutions (interim measure)	Land footprint (m2)	Increase to the cumulative area each year positively managed for nature by Scottish Water irrespective of ownership
1.42	Climate Change Mitigation	Biodiversity and Nature Based Solutions (final measure)	Biodiversity net gain or improvement	n/a
1.43	Resource recovery	Resource recovery	tCO2e	n/a
1.44	Asset health	Equipment/asset health index		n/a

Table 2: Enhancements and Growth Outputs

Commentary

Contents

1 Overview of Enhancements and Growth Outputs

The following commentary provides an overview of the enhancements and growth outputs, and expenditure as detailed in Draft Business Plan (DBP) Table 2, encompassing SR27, SR33, SR39, SR45, and Scenarios B and C.

Further information on the development of SR27 Outputs and Investment can be found in the Appendix A – Developing SR27 Outputs.

All investment is currently shown in 23/24 it will be updated to 24/25 for the Final Business Plan Submission.

2 Block A: Forecast Outputs (SR27)

The commentary below explains how the output categories align with the outcomes from Table 1. It also discusses which delivery Gate Scottish Water (SW) used to forecast and report the year the output will benefit customers or the environment, and the rationale behind this choice.

An assumption has been made that Customers and/or the environment will start realising the benefit from Gate 100 ((G100) (Acceptance). This is the anticipated date where works is completed on site, prior to paperwork between Scottish Water & internal / external stakeholders (i.e. final invoicing).

The initial output profile for any specific category has been generated for each investment line in either Copperleaf (pre Gate 30 (G30)) or P3M (post G30). In Copperleaf, Environment, Planning and Assurance Directorate (EPA) assigns the Output Value Model to each investment line and captures the output type and quantity of outputs delivered (to the specific month); for investments driven by Management Approach (MA) policies, these will be sourced from here.

Final profiling of DBP Table 2 investment and outputs has been undertaken within the Table X file used to populate Tables 2,3, 3a, and 5. This was necessary to ensure that the overall portfolio investment profiling is aligned to the available annual finance assumptions from the Finance Model. For Draft Business Plan there are instances where we have had to take a high-level approach to profiling to get a realistic profile at a Management Approach level. In some instance this has been achieved through the inclusion of top-down adjustment lines and/or the application of standard profiles to block investment lines, rather than the wholesale reprofiling of individual projects. More information can be found in the Investment Planning Technical Appendix. More detailed project level profiling will be required at Final Business Plan stage.

3 Block B: Capital Expenditure

For this draft submission, all the expenditure is presented in 2023/24 price base, and is a forecast of SW's most likely outturn cost including risk allowances. All expenditure is formatted to show as 3 decimal places, but the values have not been fixed to 3 decimal places as per the guidance, this will be addressed for final business plan submission.

The Service Risk Manager and Portfolio Manager review and approve bottom-up investment demands (Capital Expenditure and outputs). This approach applies uniformly across all output types.

The Primary investment driver is 'tagged' to each investment line that is generated from the bottom-up investment demand in Copperleaf. Service planners operate with specific primary and funding Needs (these are like buckets). Investments are driven by Management Approach (MA) policies (i.e. replace Xkm of AC mains in a given timeframe) and additional demand identified on top of the MA's.

Investment lines are costed, with actuals and forecasts captured, and are linked back to the Primary Need and additional funding Needs (if applicable) whereby an investment has split funding. The allocation of investment to Needs can be updated at any project approval gateway.

Each investment line in Copperleaf (pre G30) and P3M (post G30) has outputs assigned (output type, planned & actual quantity) based on the Investment Need allocation and the date the benefit can start being realised (G100).

3.1 Proportional allocation of expenditure

Allocation of all investment lines within our Investment Planning tool Copperleaf and our investment management tool P3M are consistent in that all investment is allocated directly against the various appropriate Investment Need line(s) that relate to the investment drivers for the projects or programmes. Examples of how this works are included within the Table 5 Commentary document.

3.2 Alternative Scenarios

Alternative scenarios have been provided within block A and B of DBP Table 2.

3.2.1 Scenario Overview - Scenario B

CPI + 5 % - Delivering more for customers into the future. £238m increase in growth and enhancement investment.

Key differences to scenario A provided in the line-by-line commentary.

3.2.2 Scenario Overview - Scenario C

CPI + 3% - Address the problems we can today. Reduce growth and enhancement investment by £222m by delaying addressing the causes of problems for future customers, introducing more volatility into today's service levels and changing our approach to internal sewar flooding.

Key differences to scenario A provided in the line-by-line commentary.

3.3 Long Term Investment Strategy (LTIS)

LTIS Forecast Output profiles for each specific category that has generated investment is presented on each line using the total amount of outputs identified in the LTIS, excluding those being delivered in SR27. Where feasible, we provide commentary explaining why the future outputs have been profiled and demonstrate how this is evaluated within the context of the overall c£50bn projected investment and assumed funding profile for each period. Additionally, several assumptions are outlined, emphasising the demand not included in the long-term projections.

Further information on the development of Long Term Investment Strategy can be found in the Appendix B – Developing Long Term Strategy.

3.4 Improvement plans

3.4.1 Draft Plan to Final Plan

3.4.1.1 SR27

- Phasing of expenditure and outputs has been completed at a high level. Ahead of the Final Business Plan (FBP) submission this will be developed to create further granularity. This could result in some movement of investment and outputs across the SR27 period.
- Further strengthening of the alignment of DBP Table 2 outputs with DBP Table 1 outcomes will be undertaken in preparation for the FBP submission.

3.4.1.2 LTIS

- Review the long-term growth assumptions and output from the growth model refresh.
- Final review of the output profiling for SR33,39,45.
- Review the SR21 project commitments breakdown (currently held in line 2.58) and allocate to each relevant line.

3.4.2 Future

3.4.2.1 LTIS

Review the demand in certain areas to understand the impact of SR27 and take account of new study outputs. There will be a trigger reached when the Scottish Government gives direction on compliance with the rUWWTD and any impact from the Climate Change policy work. At this point a full review of demand and the impact of new requirements will be required to reassess the priorities and benefits to customers of the whole long term strategy and investment requirements. Work is on-going to review the strategic scopes and unit costs, through to the next LTIS release ahead of SR33.

4 Line commentary

In instances where alternative scenarios are not specifically mentioned, outputs and investments should be considered in accordance with scenario A.

4.1 Line reference 2.1 – Growth – Increase in Part 4 capacity at WTW

4.1.1 Block A: Forecast Outputs

This output is related to the outcome – Customers supplied by systems not capable of meeting peak demand.

At this stage, details of the SR27 outputs cannot be provided as all projects are pre-G50 and we are therefore yet to confirm Growth Output details.

Torra WTW will be delivered in latter stages of SR21 (£14.931m of growth investment in SR21) with £0.034m of investment in Year 1 of SR27.

Table 1 below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 1: Growth - Increase in Part 4 capacity at WTW

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Torra WTW capacity increase (linked to WQ Programme and Islay Strategy)	23/03/2027	609	Cat 2 - Regulatory	Torra WTW capacity increase (linked to WQ Programme and Islay Strategy)
SR21 Balmichael Resilience	N/A	2845	Cat 3	Increase the availability of water to meet strategic growth requirements - Water
SR21 Tiree Resilience	12/06/2029			
SR21 Taymouth Growth	19/03/2031			

4.1.2 LTIS

The LTIS growth demand has been profiled to peak in SR27 and then reduce in future periods to hold the current investment. This will be kept under review as part of the growth model refresh and align with the financial model.

4.1.3 Block B: Capital Expenditure

The SR27 forecast investment for Growth – Increase in Part 4 capacity at WTW is £43.592m.

4.2 Line reference 2.2 - Increase in Part 4 capacity to meet wastewater growth requirements

4.2.1 Block A: Forecast Outputs

This output contributes to the outcome - The total number of pollution incidents from a sewerage asset affecting the water environment.

The SR27 Output values have been provided for all post G50 projects and for pre-G50 project estimates where available.

Scenario C includes decreased investment of £76m for emerging demand on wastewater treatment works. This will not have an impact on SR27 outputs as the schemes planned would be delivered post SR27.

Table 2 below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 2: Increase in Part 4 Capacity to meet wastewater growth requirements

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
North Berwick WwTW – UWWTD Compliance	05/05/2031	809	Cat 2 - Commitment	North Berwick, and East Stirlingshire
Eastern Stirling Villages - Growth	30/07/2032			
AVSE - Growth (capex) Seafield	N/A	811	Cat 3	Confirmed development in catchments which require investment
Allanfearn WwTW - Treatment and bioresource	N/A			
Confirmed development in catchments which require investment	N/A			
SR27 Growth Project Development to Gate 50	N/A			
Additional Dunfermline Growth	N/A			
Persley Growth from Aberdeen Strategy	N/A			
Nigg Growth small option	N/A			
Bridge of Don Persley Transfer	N/A			
Dalderse WwTW - Growth	13/12/2029			
Rosewell WwTW Growth	20/04/2029			
Erskine WwTW - Growth	07/10/2031			

4.2.2 LTIS

The LTIS growth demand has been profiled to peak in SR27 and then reduce in future periods to hold the current investment total for WW growth. This will be kept under review as part of the growth model refresh and align with the financial model.

4.2.3 Block B: Capital Expenditure

The SR27 forecast investment for Increase in Part 4 capacity at WTW is £390.669m, with outputs of 180,491 Population Equivalent expected to be delivered within the SR27 Period.

Significant investment of £137.887m is included for development of schemes at Seafield WWTW, Dunfermline, Aberdeen and Nigg which are not expected to deliver outputs until the SR33 period.

4.3 Line reference 2.3 - Additional Part 3 capacity enabled from strategic water network reinforcement

4.3.1 Block A: Forecast Outputs

This output is related to the outcome - Customers supplied by systems not capable of meeting peak demand.

The forecast projects an output delivery of 6Ml/d within the SR27 period.

The SR27 Output values have been provided for Infra-charge Funded projects (ICF) ICF Castle Moffat, Nairn strategic upgrade and ICF Carron Valley.

Table 3 (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 3: Additional Part 3 Capacity enabled from strategic water network reinforcement

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Reinvestment of the receipts from the Infrastructure Charge to create or restore capacity in the general network - Water	09/06/2025	938	Cat 2 - Commitment	Reinvestment of the receipts from the Infrastructure Charge to create or restore capacity in the general network – Water
ICF Castle Moffat SWIA Impact 21 Solution 4 Blindwells	17/05/2030			
Additional allocation for Infrastructure Charge spending to net off against forecast receipts in the SR27 period	N/A			

4.3.2 LTIS

The flat investment profile is based on assumed developer funding and requirements (once schemes are known they will be promoted up to the funding level which is based on a levy on developments). No outputs are shown as investment is as per the funding model.

4.3.3 Block B: Capital Expenditure

The SR27 forecast investment for Additional Part 3 capacity enabled from strategic water network reinforcement is £53.855m.

4.4 Line reference 2.4 - Additional Part 3 capacity enabled from strategic wastewater network reinforcement

4.4.1 Block A: Forecast Outputs

This output does not directly contribute to any Table 1 outcome.

The SR27 Output values have been provided for ICF West Edinburgh as well as smaller post gate 50 projects which have been consolidated into ID "Under £6m-2841" largely forecasting to deliver in year 1 and year 2 of the period except for Dunbeg which can be seen in Year 6. In addition ICF – West Edinburgh Strategic Approach Pump Transfer Scheme is forecast to deliver in Year 3.

Table 4 (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 4: Additional Part 3 capacity enabled from strategic wastewater network reinforcement

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Reinvestment of the receipts from the Infrastructure Charge to create or restore capacity in the general network - Waste	N/A	2841	Cat 2 - Commitment	Reinvestment of the receipts from the Infrastructure Charge to create or restore capacity in the general network - Waste
ICF - West Edinburgh Strategic Approach Pump Transfer Scheme - Wastewater	23/11/2029			

4.4.2 LTIS

The flat investment profile is based on assumed developer funding and requirements (once schemes are known they will be promoted up to the funding level which is based on a levy on developments). No outputs are shown as Investment is as per the funding model.

4.4.3 Block B: Capital Expenditure

The SR27 forecast investment for Additional Part 3 capacity enabled from strategic wastewater network reinforcement is £66.547m, with forecast to deliver outputs of 87,602 Population equivalent within the SR27 Period.

4.5 Line reference 2.5 - Number of lead communication pipes replaced

4.5.1 Block A: Forecast Outputs

This output is related to the outcome - Estimated number of lead pipes remaining in public network.

The forecast outputs in SR27 are 3,000 per year. This is split across 3 main investment lines in Table 5. Replacements based on customer requests, samples exceeding 5 microgram/l and opportunistic replacements.

Table 5: Number of lead communication pipes replaced (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver (where a project has multiple needs, the investment is split out by need with any associated input).

Table 5: Number of lead communication pipes replaced

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
3,700 pipes assumed, when sampled will exceed 10 microgram/l.	N/A	652	Cat 2a - Regulatory	3,700 pipes assumed, when sampled will exceed 10 microgram/l.
Option to replace 800 pipes assumed will exceed 5 microgram/l.	N/A	653	Cat 2a - Regulatory	Option to replace 800 pipes assumed will exceed 5 microgram/l.

Lead Comms Replacement-Customer Requested Project	N/A	654	Cat 2a - Regulatory	3,100 pipes assumed when customer request or opportunistically encountered.
Lead Comms Replacement-Opportunistic Replacements Project	N/A			
3,100 pipes assumed when customer request or opportunistically encountered.	N/A			

4.5.2 LTIS

The strategy is to remove of lead from public network by 2045. Currently SR27 is focused on customer request and addressing water quality failures and pilot replacement project (Gorgie).

4.5.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of lead communication pipes replaced is £33.965m, with forecast to deliver outputs of 18,000 Number within the SR27 Period.

4.6 Line reference 2.6 - Capacity at WTW with new or optimised phosphate equipment

4.6.1 Block A: Forecast Outputs

This output is related to the outcome - Indicator of lead in customers supply pipes. There is no outputs planned within Capacity at WTW with new or optimised phosphate equipment. There is a programme to install phosphate monitors at WTW but this is categorised as maintenance and captured in table 3a. row ref 3a.12

Table 6: Capacity at WTW with new or optimised phosphate equipment (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 6: Capacity at WTW with new or optimised phosphate equipment

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Inv. Hierarchy**	**Need Description / Investment Driver**
Phosphate Monitors at WTWs	N/A	2428	Cat 1	Phosphate Monitors at WTWs

4.6.2 LTIS

There is no demand identified in the long term for addressing phosphate removal. Maintenance of existing equipment is held under AR3. The demand is more on chemicals of interest (PFAS) and studies on going to assess this and current demand is included in line 2.8.

4.6.3 Block B: Capital Expenditure

There is no investment within Capacity at WTW with new or optimised phosphate equipment as investment to install phosphate monitors at WTWs has been categorised as maintenance and is held in Table 3a row Ref 3a.12.

4.7 Line reference 2.7 - Capacity at WTW sites with new auto-shutdown risk control interventions

4.7.1 Block A: Forecast Outputs

This output is related to the outcome - Drinking water quality risks across all systems above long-term tolerable threshold.

For DBP, forecast outputs of 415 Ml/d for all potential sites within the SR27 period have been included.

Blairlinnans WTW is expected to be delivered in year 6 and smaller value projects have been consolidated into one line, delivering throughout the period.

Table 7: Capacity at WTW sites with new auto-shutdown risk control interventions (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 7: Capacity at WTW sites with new auto-shutdown risk control interventions

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Develop solutions at 21 sites (auto shutdown / run to waste)	22/03/2029	536	Cat 2b - Regulatory	Develop solutions at 21 sites (auto shutdown / run to waste)
SR21 ASD - Blairlinnans WTW	21/03/2031			

4.7.2 LTIS

All remaining demand is expected to be addressed by SR33.

4.7.3 Block B: Capital Expenditure

The SR27 forecast investment for Capacity at WTW sites with new auto-shutdown risk control interventions is £26.806m.

4.8 Line reference 2.8 - Capacity at WTW sites made compliant with standards

4.8.1 Block A: Forecast Outputs

This output contributes to outcomes for Total Drinking Water Compliance and Taste & Odour contacts, with outputs of 1,045 Ml/d within the SR27 Period expected to be delivered within the SR27 Period.

The SR27 outputs are provided for projects and programmes post G50. Outputs for Glenfarg WTW and Black Esk WTW will deliver early in SR27 with significant investment levels included within SR21 period. Glenfarg forecast is £85m in SR21 and £27m in SR27. Black Esk WTW forecast is £103m in SR21 and £11m in SR27.

Investment is also included for development of projects where the output will be delivered in SR33. This includes the named Greenock WTW project and lower value projects within the consolidated lines.

Investment has been included for 129Ml/d outputs at Daer WTW in SR27 associated with interim improvement works, along with £36m for development of a longer-term strategic replacement that will not be delivered until the SR33 period.

There are 11 sites within this Output category where the delivery timescales are planned to ensure achievement of Regulatory Commitment dates agreed with the DWQR.

Scenario B includes increased investment of £42m to provide increased water quality by building the replacement of Castle Moffatt WTW which increases outputs by 32 Ml/d. There is no reduction to the number of outputs in Scenario C.

Table 8: Capacity at WTW sites with new auto-shutdown risk control interventions (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 8: Capacity at WTW sites with new auto-shutdown risk control interventions

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Investment Hierarchy**	**Need Description / Investment Driver**
SR21 Turriff WTW	11/03/2030	532	Cat 2a - Regulatory	Improve Water Treatment Works
SR21 ES Glenfarg WTW upgrade	15/02/2028			

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Investment Hierarchy**	**Need Description / Investment Driver**
SR21 ES Black Esk WTW	15/10/2027			(WTWs) with persistent non-trivial fails (Group 1) (committed / enforced).
SR21 Mannofield WTW Process Maximisation	29/10/2030			
SR21 Bradan WTW Future Plan	09/06/2031			
Improve Water Treatment Works (WTWs) with persistent non-trivial fails (Group 1) (committed / enforced).	03/04/2031			
Greenock WTW				
SR21 Glendevon WTW	10/10/2029	533	Cat 2a - Regulatory	Improve Water Treatment Works (WTWs) with persistent non-trivial fails (Group 2)
SR21 Stornoway WTW	27/03/2031			
Improve Water Treatment Works (WTWs) with persistent non-trivial fails (Group 2)	05/08/2030			
SR21 Camphill WTW	26/09/2030			
SR21 Penwhirn WTW	21/07/2032			
SR21 Glenlatterach WTW	03/07/2031			
SR21 Londornoch WTW	09/04/2031			
SR21 Penwhirn WTW	21/07/2032	534	Cat 2b - Regulatory	Improve Water Treatment Works (WTWs) with persistent non-trivial fails (Group 3)
SR21 Glenlatterach WTW	03/07/2031			
Daer WTW - DEVELOP - Strategic Replacement	N/A			
Allocation for 3x responsive UV installations	N/A			
Carron Valley WTW - DELIVER - Taste & Odour Improvements	N/A	MA006	Cat 2b - Regulatory	HAA - 3 sites with Letters of Commitment (MA006 NEW 3)

4.8.2 LTIS

Steady progress is expected towards water treatment compliance and managing risks. This output includes a combination of sub outcomes (Organics, THMS, Discolouration and chemicals).

4.8.3 Block B: Capital Expenditure

The SR27 forecast investment for Capacity at WTW sites made compliant with standards is £565.524m.

4.9 Line reference 2.9 - Capacity at WTW sites with improved treatment process

4.9.1 Block A: Forecast Outputs

This output is related to the outcome - Drinking water quality risks across all systems above long-term tolerable threshold.

For DBP, forecast outputs of 230 Ml/d for 14 potential sites within the SR27 Period.

The SR27 outputs are provided for post gate 50 projects. Significant outputs from North Lochs Upgrade in year 1, Assynt in year 2, Lintrathen in year 3 and Inverness in year 6. £10.21m has been included for development of Bradan WTW solution in SR27 but output delivery will not be until SR33.

Table 9: Capacity at WTW sites with improved treatment process below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 9: Capacity at WTW sites with improved treatment process

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Develop solutions (Disinfection improvements)	N/A	540	Cat 2b - Regulatory	Develop solutions at 16 sites (Disinfection improvements)
Bradan - DEVELOP - Disinfection Byproducts Improvements	N/A			
IR18 Completion	21/02/2025	559	Cat 2 - Regulatory	IR18 Completion
Eela Water clarifier hydraulic restriction	08/11/2027	603	Cat 2a - Regulatory	

4.9.2 LTIS

The demand has been back-end loaded as the demand addresses risk rather than immediate compliance issues.

4.9.3 Block B: Capital Expenditure

The SR27 forecast for investment Capacity at WTW sites with improved treatment process is £35.724m.

4.10 Line reference 2.10 - Number of raw water supplies with improved water quality

4.10.1 Block A: Forecast Outputs

This output is related to the outcome - Total drinking water compliance, with outputs of 34 Numbers within the SR27 Period.

Table 10: Number of raw water supplies with improved water quality below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 10: Number of raw water supplies with improved water quality

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Raw Water Supplies - Improve Water Quality	08/01/2030	3298	Cat 2a - Regulatory	Improve water quality supplied from raw water infrastructure to ensure compliance with water quality regulations where not supplied under a commercial raw water agreement

4.10.2 LTIS

The expectation is that all these sites will all be addressed in SR27. There is no residual demand.

4.10.3 Block B: Capital Expenditure

The SR27 forecast for Number of raw water supplies with improved water quality is £27.809m.

4.11 Line reference 2.11 - Number of Event Duration Monitors (EDM) deployed

4.11.1 Block A: Forecast Outputs

This output does not directly contribute to any Table 1 outcome, with 1300 outputs expected to be delivered within the SR27 Period. This number represents 1 monitor per site, duty/standby monitors at the same site are recorded as a single output (not multiple outputs).

Table 11: Number of Event Duration Monitors (EDM) deployed below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment

driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 11: Number of Event Duration Monitors (EDM) deployed

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
100% EDM coverage of IDs	N/A	869	Cat 2 - Commitment	Deploy Event Duration Monitors (EDM) at locations within 5km of designated waters

4.11.2 LTIS

It is proposed to increase the roll out of the EDM programme over SR33 and SR39 to improve monitoring coverage and support the management of the catchment and provide evidence of where issues may be occurring.

4.11.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of EDM deployed is £9.175m.

4.12 Line reference 2.12 - Number of unsatisfactory intermittent discharges (UID) improved or removed

4.12.1 Block A: Forecast Outputs

This output is related to the outcome - Unsatisfactory intermittent discharges (UID), with 125 outputs expected to be delivered within the SR27 Period. In Years 1 and 2, significant investment will be driven by "high priority" UID projects that are planned to commence delivery in SR21.

Significant investment of £245.164m is associated with a major project to address UIDs at the Water of Leith in Edinburgh. This investment is profiled across the SR27 period, but dates are still to be confirmed as the scheme is still pre-G50.

Allowance is included for development of 55 Medium Priority UIDs that will deliver outputs in SR33.

Scenario B includes increased investment of £57m in UIDs with environmental impact by beginning to deliver improvements in medium priority UIDs and increasing outputs by 10.

Table 12: Number of unsatisfactory intermittent discharges (UID) improved or removed (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 12: Number of unsatisfactory intermittent discharges (UID) improved or removed

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Reduce the risk of environmental pollution from CSOs - Develop solutions to priority UIDs (catchments to be agreed with SEPA) for aesthetics	N/A	957	Cat 2a - Regulatory	Reduce the risk of environmental pollution from CSOs - Develop solutions to priority UIDs (catchments to be agreed with SEPA) for aesthetics
UID RO 63 Connaught Place CSO	07/09/2028			
UID Dean Village Dean Terrace CSO	14/09/2028			
UID-Dean Village Saunders Street CSO	14/09/2028			
UID Dean Village Hawthorn Bank Lane CSO	14/09/2028			
UID - Haymarket Opp. 24 Magdala Crescent CSO	14/09/2028			
UID - Leith OS 77 Shore St CSO	14/09/2028			
UID Leith Coalhill CSO	14/09/2028			
UID Leith Shore St Bernard St CSO	14/09/2028			
UID-Leith Tower St Malmaison Hotel CSO	14/09/2028			
UID- CSO 001999 Great Junction Street	14/09/2028			
UID- Leith Sheriff Brae CSO	14/09/2028			
UID Leith Shore St Timber Bush CSO	14/09/2028			
UID Murrayfield Roseburn Cliff CSO	08/09/2028			
UID RO 1 Wester Coates Place	14/09/2028			
UID – Mountcastle Drive North Mountcastle	17/01/2029			
UID - Egypt Mews Cluny Place Newington	17/01/2029			
UID Programme to be allocated	N/A			
Reduce the risk of environmental pollution from CSOs - Develop solutions to priority UIDs (catchments to be agreed with SEPA) for water quality	15/09/2028	3287	Cat 2b - Regulatory	Reduce the risk of environmental pollution from CSOs - Develop solutions to priority UIDs (catchments to be agreed with SEPA) for water quality

4.12.2 LTIS

It is proposed to make steady progress to resolve all the UIDs over the 25yr period. There is an expectation (risk) of a 20% increase in UIDs due to climate change built into the output projections. Further modelling work with the latest rainfall data is underway to improve the projections. This line should be read in conjunction with line 2.52 as both are required to remove all UIDS.

4.12.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of unsatisfactory intermittent discharges (UID) improved or removed is £393.339m.

4.13 Line reference 2.13 - Number of sites with Water Framework Directive improvements

4.13.1 Block A: Forecast Outputs

No output values are available currently as all projects are pre-G50. Output values will be developed over the SR27 period.

Table 13: Number of sites with Water Framework Directive improvements details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 13: Number of sites with Water Framework Directive improvements

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
CAR compliance enhancement -automated compensation valves	N/A	2257	Cat 2a - Regulatory	Support compliance with changes to CAR Licence conditions to meet RBMP3 commitments
CAR compliance enhancement -fish passes	N/A			

4.13.2 LTIS

It is proposed to address all known water framework requirements under RBPM3. There has been no allowance for any requirements that may be identified under RBPM4

4.13.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of sites with Water Framework Directive improvements is £39.008m.

4.14 Line reference 2.14 - Number of sites with reservoir drawdown enhancements

4.14.1 Block A: Forecast Outputs

This output is not related to an outcome and there are no outputs within the Number of sites with reservoir drawdown enhancements. Any demand in this area is categorised as maintenance and it captured in Table 3a row ref 3a.4.

4.14.2 LTIS

This demand is now addressed under AR3 and the reservoir programme.

4.14.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Number of sites with reservoir drawdown enhancements. Any demand in this area is categorised as maintenance and it captured in table 3a row ref 3a.1.

4.15 Line reference 2.15 - Increase in renewable energy generated

4.15.1 Block A: Forecast Outputs

This output is related to the outcome - Net Zero Emissions.

At this stage, details of the SR27 outputs cannot be provided as all projects are pre-G50. Output values will be developed over the SR27 period.

This investment is associated with our West Central system bio-resources investment at Daldowie STC and the supporting work at other sites.

Investment profile has been front-ended to ensure that commitments to complete significant elements of this work by 2031 are met.

Table 14: Increase in renewable energy generated (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input.)

Table 14: Increase in renewable energy generated

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
West Central System - Dalderse - Conversion to dewatering	N/A	807	Cat 2 - Commitment	Develop plans to generate energy and maximise value at Daldowie Sludge Treatment Centre post PFI contract
West Central System - Kinniel Kerse - Conversion to dewatering	N/A			
Develop plans to generate energy and maximise value at Daldowie Sludge Treatment Centre post PFI contract	N/A			

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
West Central System - Cumnock - Conversion to dewatering	N/A			
West Central System - Meadowhead - Conversion to dewatering	N/A			
West Central System - Galashiels - Conversion to dewatering	N/A			
West Central System - Screening (WWTW)	N/A			
West Central System - Fine Screening (STC)	N/A			
West Central System - GGSM	N/A			
West Central Bioresource	31/03/2031			

4.15.2 LTIS

This has been front end loaded to meet the carbon target.

4.15.3 Block B: Capital Expenditure

The SR27 forecast investment for Increase in renewable energy generated is £462.639m.

4.16 Line reference 2.16 - Population equivalent of WWTW sites with environmental pollution risk reduced

4.16.1 Block A: Forecast Outputs

This output is not directly related to a Table 1 outcome.

£10m of investment is forecast to be spent on this project prior to SR27 period.

Table 15: Population equivalent of WWTW sites with environmental pollution risk reduced (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input.)

Table 15: Population equivalent of WWTW sites with environmental pollution risk reduced

Investment Name	Forecast Acceptance (Gate 100)	Need	Inv. Hierarchy	Need Description / Investment Driver
Reduce risk of malodour at Seafield WwTW	N/A	2229	Cat 2 - Commitment	Reduce risk of malodour at Seafield WwTW

4.16.2 LTIS

These outputs have been back end loaded as they address risk (impact of dilution rates due to climate change) rather than immediate compliance issues.

4.16.3 Block B: Capital Expenditure

The SR27 forecast investment for Population equivalent of WWTW sites with environmental pollution risk reduced is £6.942m to address odour issues at Seafield WWTW which currently has outputs of 757,000 population equivalent.

4.17 Line reference 2.17 - Area of carbon capture sites established or supported

4.17.1 Block A: Forecast Outputs

This output is related to the outcome - Carbon capture/sequestration, with outputs of 4,500 Hectares expected to be delivered within the SR27 Period.

The SR27 outputs include Loch Katrine Land Management Plan and peatland restoration. Forecast is flat year on year as this is a high-level assumption yet to be defined in detail. Detailed profiling will be developed during the SR27 period.

Table 16: Area of carbon capture sites established or supported (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input.)

Table 16: Area of carbon capture sites established or supported

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Net Zero Emissions - Understanding and Increasing	07/02/2031	2835	Cat 3	Net Zero Emissions - Understanding and

Carbon Capture and Storage in Scottish Water s Landholdings.				Increasing Carbon Capture and Storage in Scottish Water s Landholdings.
We Enhance Scotland's Environment 10 - N2835 Overspill / Block line	N/A			
Net Zero Emissions - Understanding and Increasing Carbon Capture and Storage in Scottish Water's Landholdings. -Top-down adjustment	N/A			

4.17.2 LTIS

The demand has been front end loaded to meet the carbon target by 2040.

4.17.3 Block B: Capital Expenditure

The SR27 forecast investment for Area of carbon capture sites established or supported is £18.430m.

4.18 Line reference 2.18 - Number of sludge treatment centres achieving compliance with Industrial Emissions Directive

4.18.1 Block A: Forecast Outputs

The forecast indicates 8 outputs will be delivered within the SR27 Period.

The SR27 outputs from 6 named projects (Nigg, Hatton, Seafield, Cumnock, Galashiels, Allanfearn) and a more general row for Compliance delivery at STC assets delivering 2 outputs. All projects forecast to deliver in the latter half of the period.

Table 17: Number of sludge treatment centres achieving compliance with Industrial Emissions Directive (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input.)

Table 17: Number of sludge treatment centres achieving compliance with Industrial Emissions Directive

Investment Name	Forecast Acceptance (Gate 100)	Need	Inv. Hierarchy	Need Description / Investment Driver
Industrial Emissions Directive (IED) compliance for existing Sludge Treatment Centres	N/A	3296	Cat 2a - Regulatory	Industrial Emissions Directive (IED) compliance for existing Sludge Treatment Centres
IED - Cumnock	N/A			

IED Compliance Delivery at STC assets	N/A			

4.18.2 LTIS

The demand has been front end loaded to meet the directive compliance date.

4.18.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of sludge treatment centres achieving compliance with Industrial Emissions Directive is £39.604m.

4.19 Line reference 2.19 - Reduction in energy usage through improved energy efficiency

4.19.1 Block A: Forecast Outputs

This is related to 2 outcomes - Operational emissions (Water) and (Waste), with outputs of 45 GWh / Annum expected to be delivered within the SR27 Period

This area is in development and the output forecast is based on a high-level assumption which includes estimates from the Water Continuity Technical Appendix for leakage and demand management, and The Climate Change Mitigation Technical appendix (energy efficiency and, where cost-effective, on-site renewables). Output forecasts will develop as SR27 progresses.

Table 18: Reduction in energy usage through improved energy efficiency (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input.)

Table 18: Reduction in energy usage through improved energy efficiency

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
SR27 Improve Energy Efficiency at Existing Operational Sites (WW Assets) - N785	N/A	785	Cat 3	Develop energy efficient technology strategies
Develop energy efficient technology strategies	N/A			
SR27 Energy Efficiency - Water Sites - N2254	N/A	2254	Cat 3	Improve Energy Efficiency at Existing Operational Sites (Water Assets)
Improve Energy Efficiency at Existing Operational Sites (Water Assets)	N/A			

Process Emissions - Nitrous Oxide Pathway	N/A	2838	Cat 3	Net Zero Emissions - Understanding, measuring, managing, and reducing the impact of wastewater process emissions.
Process Emissions - Methane Pathway	N/A			
Net Zero Emissions - Understanding, measuring, managing, and reducing the impact of wastewater process emissions.	19/04/2027			

4.19.2 LTIS

The demand has been front end loaded in SR27 to meet the Net Zero target of 2040.

4.19.3 Block B: Capital Expenditure

The SR27 forecast investment for Reduction in energy usage through improved energy efficiency is £65.510m

4.20 Line reference 2.20 - Number of properties where persistent low pressure is resolved

4.20.1 Block A: Forecast Outputs

This is related to the outcome - Number of properties on the low-pressure register, with outputs of 40 expected to be delivered within the SR27 Period.

Hattonrigg will deliver 3 outputs in year 2 with the remaining outputs held within undefined block investment lines forecast to deliver across years 4-6 of the period.

Table 19: Number of properties where persistent low pressure is resolved (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 19: Number of properties where persistent low pressure is resolved

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Inv. Hierarchy**	**Need Description / Investment Driver**
Resolve properties confirmed with persistent low pressure	N/A	578	Cat 3	Resolve properties confirmed with persistent low pressure

4.20.2 LTIS

The demand is assumed a steady run rate to address customer low pressure issues as they arise.

4.20.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of properties where persistent low pressure is resolved is £11.710m.

4.21 Line reference 2.21 - Number of properties with reduced risk of flooding from mains

4.21.1 Block A: Forecast Outputs

There are no outputs within Number of properties with reduced risk of flooding from mains in SR27.

4.21.2 LTIS

No demand has been identified to be delivered as part of the LTIS. If there are specific issues that arise these will be reviewed within the Resilience to Hazard programme. The long term demand will be reassessed in September 25.

4.21.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Number of properties with reduced risk of flooding from mains currently. If there are specific issues that arise these will reviewed within the Resilience to Hazard programme.

4.22 Line reference 2.22 - Number of properties with improved resilience of water supply

4.22.1 Block A: Forecast Outputs

Investment that could be associated with this output has been mapped against line ref 2.43 Additional Water Available for Use (WAFU) benefit from supply interconnectors.

4.22.2 LTIS

The demand profile back end loaded as the demand is addressing risks rather than compliance.

4.22.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Number of properties with improved resilience of water supply as Investment that could be associated with this output has been mapped against line ref 2.43 Additional WAFU benefit from supply interconnector to remove any potential duplication.

4.23 Line reference 2.23 - Number of properties removed from internal flooding at risk register

4.23.1 Block A: Forecast Outputs

This output is related to the outcome Number of properties at risk of internal flooding, with outputs of 300 expected to be delivered within the SR27 Period.

This consists of 87 named schemes forecasting to remove 182 properties and a block investment line of non-named projects delivering the remaining 118 across years 4-6 of the period. These output figures do not include any temporary measures as these outputs are captured under a Mitigations for internal flooded properties Apr 2027 - Mar 2033 need 831 which has been mapped to row 2.58 (other enh).

Scenario B includes investment of £76m in internal flooding to protect the performance in a changing climate, moving from maintaining to reducing by removing an additional 53 properties from the risk register.

Scenario C includes investment of £136m in external flooding by moving to property level mitigations, prioritising traditional solutions only where there is a high cost-benefit ratio and no prospect of a strategic solution. Potentially resulting in an increase of 150 properties on the risk register.

Table 20: Number of properties removed from internal flooding at risk register (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 20: Number of properties removed from internal flooding at risk register

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
IFOS Emerging SR21 Non-named Projects	N/A	837	Cat 3	To reduce flood risk to customers impacted by repeat high consequence internal sewer flooding where not disproportionately expensive
Project not named due to customer confidentiality (Code 5023270000)	23/10/2029			
Project not named due to customer confidentiality (Code 5036970000)	30/08/2030			
To reduce flood risk to customers impacted by repeat high consequence internal sewer flooding where not disproportionately expensive	01/08/2030			
Project not named due to customer confidentiality	22/10/2029			

(Code 5362090000)				

4.23.2 LTIS

The demand proposal provides for addressing all properties on the internal flooding register. There is an expected 20% increase due to climate change. The significant increase in later years is to remove all properties from the flooding register at a 1 in 30 event (an increase from 1 in 10). This also includes investment for mitigation measures. Further modelling work with the latest rainfall data is underway to improve the projections.

4.23.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of properties removed from internal flooding at risk register is £212.522m

4.24 Line reference 2.24 - Number of properties removed from external flooding at risk register

4.24.1 Block A: Forecast Outputs

This output is related to the outcome - Number of properties at risk of external flooding, with outputs of 624 expected to be delivered within the SR27 Period.

There are 7 named schemes that will remove 98 properties from the flood register, the highest impact named projects being Alton Way Montrose which is forecasting to deliver 40 in year 1 and Barron Terrace, Waggon Road Leven which is forecasting to deliver 36 in year 3. The remaining 526 outputs are held within a block investment line for emerging priority areas and secondary outputs from internal flooding projects.

Table 21: Number of properties removed from external flooding at risk register (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 21: Number of properties removed from external flooding at risk register

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
EFOS Emerging Priority Areas	N/A	835	Cat 3	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive
To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	10/09/2027			

4.24.2 LTIS

There is limited progress on addressing external flooding in initial periods. The investment has been back end loaded due to the funding scenario. Further modelling work with the latest rainfall data is underway to improve the projections.

4.24.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of properties removed from external flooding at risk register is £43.449m.

4.25 Line reference 2.25 - Number of sites enabled for community access

4.25.1 Block A: Forecast Outputs

This output does not directly contribute to a Table 1 outcome, with output of 1 expected to be delivered within the SR27 Period.

Table 22: Number of sites enabled for community access (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 22: Number of sites enabled for community access

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Opening up our assets (where appropriate) to the community for leisure purposes and by taking the necessary steps to ensure we facilitate people's enjoyment of the natural environment.	N/A	911	Cat 3	Opening up our assets (where appropriate) to the community for leisure purposes and by taking the necessary steps to ensure we facilitate people's enjoyment of the natural environment.
Mugdock and Craigmaddie Reservoirs: Refreshed Strategic Approach	N/A	2429	Cat 3	Mugdock and Craigmaddie Reservoirs: Refreshed Strategic Approach

4.25.2 LTIS

This line supports a variety community initiatives, and the assumption is this will continue at a steady rate in each period.

4.25.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of sites enabled for community access is £9.829m.

4.26 Line reference 2.26 - Number of new top-up-from-the-tap points

4.26.1 Block A: Forecast Outputs

Detailed investment and output profiling has still to be completed for this output, so it has currently been profiled in line with the funding assumption profile.

Table 23: Number of new top-up-from-the-tap points (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 23: Number of new top-up-from-the-tap points

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Investment Hierarchy**	**Need Description / Investment Driver**
Continue our Top up Taps programme, installing a network of taps across the country and prevent the use of single-use plastic bottles	N/A	915	Cat 3	Continue our Top up Taps programme, installing a network of taps across the country and prevent the use of single-use plastic bottles

4.26.2 LTIS

There is no demand allowance for top of taps in the LTIS. Other customer and community initiatives are held in line 2.58.

4.26.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of new top-up-from-the-tap points is £1.229m.

4.27 Line reference 2.27 - Number of properties with meter installations for first time registered non-domestic premises

4.27.1 Block A: Forecast Outputs

This output is related to the outcome - Percentage reduction of consumption at non-household premises, with outputs of 4,920 expected to be delivered within the SR27 Period.

Table 24: Number of properties with meter installations for first time registered non-domestic premises (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 24: Number of properties with meter installations for first time registered non-domestic premises

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Investment Hierarchy**	**Need Description / Investment Driver**
Meter Maintenance and Smart Meter Replacement (Non-Household)	N/A	940	Cat 2 - Commitment	Meter installation for all first time registered nondomestic premises as per policy and provides meters for domestic occupants

4.27.2 LTIS

The long-term demand is to be reassessed once the non-domestic growth model has been re-run in September 25.

4.27.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of properties with meter installations for first time registered non-domestic premises is £22.075m.

4.28 Line reference 2.28 - Number of domestic smart meters installed

4.28.1 Block A: Forecast Outputs

There are no outputs within number of domestic smart meters installed.

4.28.2 LTIS

The initial pilot and roll out of targeted smart meters included to support drought resilience (does not include full roll out to all properties).

4.28.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Number of domestic smart meters installed currently as we monitor the results from the pilot.

4.29 Line reference 2.29 - Population equivalent of WTW sites with legacy sludge issues resolved

4.29.1 Block A: Forecast Outputs

This output does not directly contribute to a Table 1 outcome.

Table 25: Population equivalent of WTW sites with legacy sludge issues resolved (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 25: Population equivalent of WTW sites with legacy sludge issues resolved

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Develop alternative sludge disposal route options for WTW on Orkney to allow cessation of operations at Big Breck and Westray land fill sites	N/A	674	Cat 2b - Regulatory	Develop alternative sludge disposal route options for WTW on Orkney to allow cessation of operations at Big Breck and Westray land fill sites
Turret - Legacy Sludge	N/A	675	Cat 2b - Regulatory	Legacy Sludge Issues

4.29.2 LTIS

The demand is front end loaded to address licence compliance. No additional demand has been identified.

4.29.3 Block B: Capital Expenditure

The SR27 forecast investment for Population equivalent of WTW sites with legacy sludge issues resolved is £17.099m, with outputs of 85,896 Population Equivalent expected to be delivered across 2 sites within the SR27 Period.

4.30 Line reference 2.30 - Length of service relocations - water mains

4.30.1 Block A: Forecast Outputs

This output does not directly contribute to a Table 1 outcome.

Table 26: Length of service relocations - water mains (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 26: Length of service relocations - water mains

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
NRSWA HOLDING LINE SP Third Party-SR27 Water Diversions	N/A	936	Cat 2 - Commitment	Scottish Water's statutory contribution towards the relocation and integration of Scottish Water assets associated with large infrastructure schemes

4.30.2 LTIS

The investment is based on a historical run rate from previous third-party requirements. The investment is assumed to be flat profile.

4.30.3 Block B: Capital Expenditure

The SR27 forecast investment for Length of service relocations - water mains is £23.999m, with outputs of 25km expected to be delivered within the SR27 Period.

4.31 Line reference 2.31 - Length of service relocations – sewers

4.31.1 Block A: Forecast Outputs

This output does not directly contribute to a Table 1 outcome.

There is currently no visibility of the specific sites or outputs for delivery within the SR27. Definition of specific outputs will develop during SR27 period.

Table 27: Length of service relocations – sewers (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 27: Length of service relocations – sewers

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
NRSWA HOLDING LINE SP Third Party-SR27 Sewer Diversions	N/A	2840	Cat 2 - Commitment	Scottish Water's statutory contribution towards the relocation and integration of Scottish Water assets associated with large infrastructure schemes - waste

4.31.2 LTIS

The investment is based on a historical run rate from previous third-party requirements. The investment is assumed to be flat profile.

4.31.3 Block B: Capital Expenditure

The SR27 forecast investment for Length of service relocations – sewer is £13.292m.

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4.31.4 Line reference 2.32 - Number of wastewater treatment improvement studies

4.31.5 Block A: Forecast Outputs

This output does not directly contribute to a Table 1 outcome.

There are no outputs currently defined to be delivered within the SR27 Period. Investment allocation has been made to support SEPA requirements for WW Studies to be undertaken for RBMP4, rUWWTD and unlicensed dosing – with details to be confirmed as RBMP4 for Scotland is published in December 2027

Table 28: Number of wastewater treatment improvement studies (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 28: Number of wastewater treatment improvement studies

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver

Study to understand the impact of wastewater discharges on the water environment	N/A	777	Cat 2b - Regulatory	Study to understand the impact of wastewater discharges on the water environment
Studies Unlicensed dosing	N/A			
Understand level of treatment resilience as a result of climate change and other plausible hazards	N/A	787	Cat 3	Understand level of treatment resilience as a result of climate change and other plausible hazards

4.31.6 LTIS

The demand is covered in line 2.16 and 2.51. Studies are an integral part of understanding the impact of discharges on the environment and the potential benefits to the water body. Studies will be developed to help understand the benefits to any receiving water course.

4.31.7 Block B: Capital Expenditure

The SR27 forecast investment for Number of wastewater treatment improvement studies is £48.307m.

4.32 Line reference 2.33 - Number of climate change audits and studies

4.32.1 Block A: Forecast Outputs

This output does not directly contribute to a Table 1 outcome.

There are 2 outputs to be delivered within the SR27 Period. Investment allocation has been made to support SEPA requirements for Climate Resilience Studies to be undertaken and details are to be confirmed.

Table 29 Increase or replacement of capacity of treated water storage for enhancement or growth purposes (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 29 Increase or replacement of capacity of treated water storage for enhancement or growth purposes

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Update the Scottish Water risk assessment work/ tools (UKCP18) following the latest projections from Met Office	N/A	921	Cat 2 - Commitment	Further develop our understanding of the implications of climate change. Update the Scottish

				Water risk assessment work/ tools (UKCP18) following the latest projections from Met Office
Identifying technologies and pilot work across water and wastewater assets. Company-wide waste / resource audit review to embed circularity across SW. Progressing at scale outcomes from Sustainable Growth Agreement	N/A	927	Cat 3	Identifying technologies and pilot work across water and wastewater assets. Company-wide waste / resource audit review to embed circularity across SW. Progressing at scale outcomes from Sustainable Growth Agreement

4.32.2 LTIS

The LTIS is included within Line 2.39.

4.32.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of climate change audits and studies is £6.649m.

4.33 Line reference 2.34 - Increase or replacement of capacity of treated water storage for enhancement or growth purposes

4.33.1 Block A: Forecast Outputs

This output is not related to a Table1 outcome and there is no investment or outputs within this category.

Any outputs related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify output values as they are solution specific. Any outputs reported on at this point will not include decommissioned assets.

4.33.2 LTIS

The demand has been flat profiled as majority of investment to support drought is held in 2.43.

4.33.3 Block B: Capital Expenditure

There is no investment allocated in this category currently. Any investment related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify values as they are solution specific

4.34 Line reference 2.35 - Increase or replacement of capacity of raw water storage for enhancement or growth purposes

4.34.1 Block A: Forecast Outputs

This output is not related to a Table1 outcome and there is no investment or outputs within this category.

There are no outputs within this category currently. Any outputs related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify output values as they are solution specific

4.34.2 LTIS

The demand is currently has been flat profiled as majority of investment to support drought is held in 2.43.

4.34.3 Block B: Capital Expenditure

There is no investment allocated in this category currently. Any investment related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify values as they are solution specific

4.35 Line reference 2.36 - Increase or replacement of wastewater storage volume for enhancement or growth purposes

4.35.1 Block A: Forecast Outputs

This output is not related to a Table1 outcome and there is no investment or outputs within this category.

Any outputs related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify secondary output values as they are solution specific. When outputs are reported the volumes noted will be those forecast as being requited to meet permit conditions, and no additional storage at WWTW will be included.

4.35.2 LTIS

The flat profile - grey solution demand that will support flooding, and reduce discharges, UIDS. Profile to be considered as projects are promoted to see the Blue / Green and grey split.

4.35.3 Block B: Capital Expenditure

Any investment related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify values as they are solution specific. This will continue to evolve between draft and final business plan submission.

4.36 Line reference 2.37 - Increase in storage capacity delivered through Blue-Green Infrastructure

4.36.1 Block A: Forecast Outputs

This output is not related to a Table1 outcome and there are no outputs within this category.

Any outputs related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify output values as they are solution specific.

4.36.2 LTIS

The demand profile increasing over time as more partnerships are built as funding allows.

4.36.3 Block B: Capital Expenditure

Investment related to this category will be reported on during SR27 period but cannot be forecast until detailed design work is completed to quantify values as they are solution specific. This will continue to evolve between draft and final business plan submission.

4.37 Line reference 2.38 - Demand-side improvements delivering benefits (excluding benefits from metering and leakage reductions)

4.37.1 Block A: Forecast Outputs

This output is not related to an outcome and there are no outputs within this category currently. There are no leakage or metering benefits included here as these are within DBP table 2 reference 2.54 and 2.41.

4.37.2 LTIS

Line 2.38 is a provision for activities to support customer water efficiency measures and reducing household consumption. The impact and likelihood of reductions is still being assessed if charging or change to policies are not introduce.

4.37.3 Block B: Capital Expenditure

Investment related to this category cannot be forecast until detailed design work is completed to quantify value. This will continue to evolve between draft and final business plan submission.

4.38 Line reference 2.39 - Area subject to interventions to improve biodiversity

4.38.1 Block A: Forecast Outputs

This output is related to the outcome - Biodiversity and Nature Based Solutions (land use input metric), with outputs of 4,500 Hectares expected to be delivered within the SR27 Period.

The reported outputs currently mirror the carbon capture metric but will include nature-based solutions and be refined further following pilot work with NatureScot on biodiversity assessment.

Table 30: Area subject to interventions to improve biodiversity(below) details the needs that contribute to Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 30: Area subject to interventions to improve biodiversity

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Sustainability auditing/review of SW assets and estates to support future action and inform future investment planning.	N/A	929	Cat 3	Sustainability auditing/review of SW assets and estates to support future action and inform future investment planning.

4.38.2 LTIS

Demand to improve biodiversity on our estate is currently unknown however an estimate of investment has been made based on historic investment rates and a flat profiled applied as this will be an ongoing activity.

4.38.3 Block B: Capital Expenditure

The SR27 forecast investment for area subject to interventions to improve biodiversity is £4.085m (circa 4,500ha).

4.39 Line reference 2.40 - Meter upgrades – households

4.39.1 Block A: Forecast Outputs

There is no investment or outputs within Meter upgrades – households.

4.39.2 LTIS

The demand held in line 2.28 and will be used as part of an overall water demand management strategy where there are deficits.

4.39.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Number of sites with Meter upgrades – households.

4.40 Line reference 2.41 - Meter upgrades - non-households

4.40.1 Block A: Forecast Outputs

This output is related to the outcome - Percentage reduction of consumption at non-household premises with outputs of 130,000 expected to be delivered within the SR27 Period.

Table 31: Meter upgrades - non-households (below) details the needs that contribute to Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 31: Meter upgrades - non-households

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Meter upgrades – non-household	N/A	940	Cat 3	Meter installation for all first time registered non-domestic premises as per policy

4.40.2 LTIS

The demand is to upgrade all existing meters to smart meters. It is expected the majority of meters will be converted to smart meters in SR27 however it is except a minority (circ 2,000) may take longer to install. All replacement of meters is held in AR3.

4.40.3 Block B: Capital Expenditure

The SR27 forecast investment for Meter upgrades - non-households is £42.627m.

4.41 Line reference 2.42 - Length of potable water mains renewed

4.41.1 Block A: Forecast Outputs

This output is related to the outcome - Repeat interruptions to water supply with outputs of 1,723 km expected to be delivered within the SR27 Period based on an assumption of 287km/yr.

Table 32: Length of potable water mains renewed below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 32: Length of potable water mains renewed

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Maintenance activities on sections with recurring interruptions to supply	N/A	561	Cat 1	Maintenance activities on sections with recurring interruptions to supply

Maintenance activities on sections with recurring interruptions to supply	N/A	574	Cat 1	Maintenance activities on sections with recurring interruptions to supply
Maintenance activities on water mains to reduce the risk to service	N/A	575	Cat 1	Maintenance activities on water mains to reduce the risk to service
Maintenance activities on water mains where cleaning does not resolve the need.	N/A	619	Cat 1	Maintenance activities on water mains where cleaning does not resolve the need.
Accelerated Asbestos Cement water mains replacement.	N/A	27008	Cat 1	Accelerated Asbestos Cement water mains replacement.

4.41.2 LTIS

The mains renew demand and investment is held in AR3 Table 3a line 3a.20. this is so we do not double count investment between DBP table 2 and 3a.

4.41.3 Block B: Capital Expenditure

The SR27 forecast investment for Length of potable water mains renewed has not been included within DBP Table 2 as it relates to Maintenance expenditure and is captured within Table 3a.

4.42 Line reference 2.43 - Additional WAFU benefit from supply interconnectors

4.42.1 Block A: Forecast Outputs

This output contributes to two Water Availability outcomes – Customers supplied by systems not capable of meeting demand during a worst historic drought & Customers supplied by systems not capable of meeting peak demand.

It is currently forecasted to deliver outputs of 0 Ml/d within the SR27 period as all interconnectors are internal to Scottish Water and so do not increase water available for use.

The delivery of outputs associated with supply resilience at Dundee is currently forecast to be developed in SR27 for delivery in SR33.

Table 33: Additional WAFU benefit from supply interconnectors (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 33: Additional WAFU benefit from supply interconnectors

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Various	N/A	3281	Cat 3	Improve resilience of water supply systems to enable them to provide continuous water supplies

4.42.2 LTIS

The demand is to mitigate drought issues for customers. The demand is profiled increasing over time due to impact of climate change assumptions.

4.42.3 Block B: Capital Expenditure

The SR27 forecast investment for Additional WAFU benefit from supply interconnectors is £72.147m.

4.43 Line reference 2.44 - Length of new supply interconnectors

4.43.1 Block A: Forecast Outputs

There are no outputs within length of new supply interconnectors.

Any new supply interconnectors would be defined through development work undertaken through investment allocated against 2.43 Additional WAFU benefit from supply interconnectors.

4.43.2 LTIS

The demand is held within line 2.43.

4.43.3 Block B: Capital Expenditure

There is no SR27 forecast investment for length of new supply interconnectors.

4.44 Line reference 2.45 - Length of new resilience interconnectors

4.44.1 Block A: Forecast Outputs

The delivery of 3km outputs within the SR27 period is associated with one project – 'RCI Newfield PS to Broadmuir TM DMA Peterhead Newfield 12 TM' which is primarily funded in SR21, with £37m forecast expenditure in SR21 and £153K in SR27

Any additional resilience interconnector outputs would be defined through development work undertaken through investment allocated against 2.43 Additional WAFU benefit from supply interconnectors.

Table 34: Length of new resilience interconnectors (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 34: Length of new resilience interconnectors

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Enhancing network supply capability.	N/A	2843	Cat 3	Enhancing network supply capability.

4.44.2 LTIS

The demand is held within line 2.43.

4.44.3 Block B: Capital Expenditure

The SR27 forecast investment for length of new resilience interconnectors is £0.153m.

4.45 Line reference 2.46 - Increase in total flow to full treatment

4.45.1 Block A: Forecast Outputs

There are no outputs forecast currently as all projects are pre G50 . Output values will be developed over the SR27 period.

Investment allocation has been made to support SEPA requirement to demonstrate pass forward flow (PFF) spill compliance at WWTW and for mitigation measures to be undertaken to address any non-compliance issues.

Table 35: Increase in total flow to full treatment (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 35: Increase in total flow to full treatment

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
WWTW Flow to full treatment mitigation measures	N/A	3295	Cat 2a - Regulatory	Provision of appropriate equipment and analysis to demonstrate pass forward flow (PFF) spill compliance at WWTW
Provision of appropriate equipment and analysis to	N/A			

demonstrate pass forward flow (PFF) spill compliance at WWTW and that flow is maintained during the event duration.				and that flow is maintained during the event duration.

4.45.2 LTIS

The demand is front end loaded to improve compliance post studies and identification of benefits to the environment.

4.45.3 Block B: Capital Expenditure

The SR27 forecast investment for Increase in total flow to full treatment is £95.722m. This is across 3 investment demand lines, WWTW flow to full treatment mitigation measures, Laighpark WWTW and a top down allocation that forms part of the RBMP3 objectives.

4.46 Line reference 2.47 - Number of flow monitors installed at WWTW

4.46.1 Block A: Forecast Outputs

This output is not related to an outcome and there is no investment or outputs within Number of flow monitors installed at WWTW.

4.46.2 LTIS

The demand is front end load to support evince of impact from network and WWTW on receiving water bodies.

4.46.3 Block B: Capital Expenditure

There is no SR27 forecast investment for number of flow monitors installed at WWTW.

4.47 Line reference 2.48 - Population equivalent of WWTW sites made compliant with standards - chemical removal

4.47.1 Block A: Forecast Outputs

There is no investment or outputs within population equivalent of WWTW sites made compliant with standards - chemical removal.

4.47.2 LTIS

Line 2.48 is included within Line 2.51 WWTW made compliant with standards .

4.47.3 Block B: Capital Expenditure

There is no SR27 forecast investment for population equivalent of WWTW sites made compliant with standards - chemical removal.

4.48 Line reference 2.49 - Population equivalent of WWTW sites made compliant with standards – phosphorus

4.48.1 Block A: Forecast Outputs

This output is related to the outcome Percentage compliance with SEPA discharge permits and could contribute to the outcome total number of pollution incidents from a sewerage asset affecting the water environment.

49% of this programme is forecast to complete in year 1 of SR27 to meet a December 2027 legislative commitment date. Other sites associated with PFI sites at Almond Valley will deliver later in the period. It is recognised that more detailed profiling will require to be completed prior to Final Business Plan.

4.48.2 LTIS

Line 2.49 demand is included within line 2.51.

4.48.3 Block B: Capital Expenditure

The SR27 forecast investment for Population equivalent of WWTW sites made compliant with standards – phosphorus is £32.164m, with outputs of 292,525 Population Equivalent expected to be delivered within the SR27 Period.

4.49 Line reference 2.50 - Population equivalent of WWTW sites made compliant with standards - sanitary parameters

4.49.1 Block A: Forecast Outputs

There is no investment or outputs within Population equivalent of WWTW sites made compliant with standards - sanitary parameters.

4.49.2 LTIS

Line 2.50 demand is included within line 2.51

4.49.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Population equivalent of WWTW sites made compliant with standards - sanitary parameters.

4.50 Line reference 2.51 - Population equivalent of WWTW sites made compliant with standards – other

4.50.1 Block A: Forecast Outputs

This output is related to the outcome the total number of pollution incidents from a sewerage asset affecting the water environment.

With outputs of 4,332 population equivalent within the SR27 Period, associated with Bathing Water compliance at Lower Largo and Ayr South.

Table 36: Population equivalent of WWTW sites made compliant with standards – other (below) details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 36: Population equivalent of WWTW sites made compliant with standards – other

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Bathing Waters - Lower Largo	N/A	2255	Cat 2	Improve Bathing Waters
Improve Bathing Water at Ayr South	N/A	2255	Cat 2	Improve Bathing Waters

4.50.2 LTIS

The demand to ensure compliance with licence conditions has been front end loaded once studies identify the benefits to the receiving water body. This area will be impacted by the rUWWTD legislation.

4.50.3 Block B: Capital Expenditure

The SR27 forecast investment for Population equivalent of WWTW sites made compliant with standards is £25.007m, with outputs of 4,332 Population Equivalent expected to be delivered within the SR27 Period associated with Bathing Water compliance at Lower Largo and Ayr South.

4.51 Line reference 2.52 - Number of screens installed

4.51.1 Block A: Forecast Outputs

125 outputs are forecasted to be delivered within the SR27 period for the number of screens installed.

4.51.2 LTIS

In the LTIS UID demand is combined between this line and Line 2.12 (UID improvement or removal) as screens may be a solution for resolving a UID. For total UID removal both lines need to be aggregated. For DBP Table 2 the investment has been separated out for the purposes of SR27 reporting only. The number of screens is an estimate of what may be required to resolve a UID.

This area will be impacted by the new rUWWTD legislation if implemented that is currently not included in the long-term projections.

4.51.3 Block B: Capital Expenditure

The SR27 forecast investment for is Number of screens installed £0m against this output as it is captured in row ref 2.12.

4.52 Line reference 2.53 - Number of studies completed

4.52.1 Block A: Forecast Outputs

This output is not related to an outcome and there is no investment or outputs within number of studies completed. Study costs are now held in the lines that they are applicable to (Line 2.47 Flow to full treatment, 2.51 WWTW sites made compliant)

4.52.2 LTIS

The demand is covered in line 2.16 and 2.51. Studies are an integral part of understanding the impact of discharges on the environment and the potential benefits to the water body.

4.52.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Number of studies completed.

4.53 Line reference 2.54 - Reduction in leakage

4.53.1 Block A: Forecast Outputs

This output is related to the outcome - Percentage reduction of three-year average leakage.

It is forecasted that there will be a total reduction of 23Ml/d. This includes 20Ml/d from “find and fix” leakage activities and an additional 3Ml/d reduction as a secondary benefit from water mains renewal activities in SR27. Note leakage savings (25Ml/d) from Non Household smart meters is only included in in Table 1 as it will impact Tier 1 activities (through more efficient use of active leakage control).

Table 37: Reduction in leakage below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 37: Reduction in leakage

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Make progress towards reduce leakage and customer consumption / demand (180 l/p/d to 130 l/h/d by 2050.	N/A	MA099	Cat 3	Make progress towards reduce leakage (290ML/day by 2050) and customer consumption / demand (180 l/p/d to 130 l/h/d by 2050.

4.53.2 LTIS

The demand in line 2.54 is over and above the investment required to maintaining the current leakage held in Table 3a under water ancillaries (3a.26). The profile shows the main reduction is expected in SR27 and SR33 targeted to support water resource shortages. This aligns with the leakage reduction identified in the **Scottish Water Climate Change Adaptation Plan. (2024).** Work is ongoing to review the long term investment requirement in this area and assess whether other allocations will support this reduction (Water mains replacement).

Scottish Water has set ambitious goals to address leakage in its network as part of its climate change adaptation strategy. Over the past 15 years, leakage has reduced by 58%. This significant reduction has been achieved through various measures, including improved pressure management control, digital and analytical techniques to identify leaks more quickly, and targeting leaks in rural networks. To further reduce leakage, Scottish Water plans to continue investing in system connectivity, providing increased resilience to over 100,000 properties. Scottish Water will also focus on reducing leakage between its network and customer taps, as recent research indicates that up to a third of all leakage may occur between Scottish Water pipes and customers' properties.

Climate change will make managing leakage more difficult, and Scottish Water will need to target more leakage control in areas where water resources may be more at risk.

Overall, Scottish Water's leakage reduction target is a critical component of its climate change adaptation plan, aimed at protecting water resources and ensuring a reliable, resilient, and sustainable service for customers.

4.53.3 Block B: Capital Expenditure

The SR27 forecast investment for Reduction in leakage is £18.988m for “find and fix” leakage activities to deliver 18Ml/d of leakage reduction. This does not include any expenditure for maintenance of the SR21 leakage outturn performance which is accounted for under a separate Investment Need 666 which is captured in Table 3a row ref 3a.26.

4.54 Line reference 2.55 - Number of properties connected to Scottish Water's network from private water supplies

4.54.1 Block A: Forecast Outputs

There are no outputs within the SR27 period as the project is still in development for Number of properties connected to Scottish Water's network from private water supplies. Output values will be developed over the SR27 period.

Table 38: Number of properties connected to Scottish Water's network from private water supplies below details the needs that contribute to WICS Data Table 5 projects and programmes that deliver these outputs, the forecast date in which customers and/or the environment will start realising the benefits and the investment driver. (Where a project has multiple needs, the investment is split out by need with any associated input).

Table 38: Number of properties connected to Scottish Water's network from private water supplies

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Investigate the reliability of private water supplies - Aberdeenshire, Moray & Angus	N/A	2269	Cat 3	Investigate the reliability of private water supplies - Aberdeenshire, Moray & Angus

4.54.2 LTIS

There are no long-term demand, or investment is identified until the direction from Scottish Government is confirmed on Scottish Water responsibilities.

4.54.3 Block B: Capital Expenditure

The SR27 forecast investment for Number of properties connected to Scottish Water's network from private water supplies is £2.457m.

4.55 Line reference 2.56 - Number of lead communication pipes relined

4.55.1 Block A: Forecast Outputs

There is no investment or outputs within number of lead communication pipes relined as this is not an activity undertaken, any interventions on lead pipes are covered in line 2.5.

4.55.2 LTIS

There is no demand projected here as it is covered in line 2.5.

4.55.3 Block B: Capital Expenditure

There is no SR27 forecast investment for number of lead communication pipes relined.

4.56 Line reference 2.57 - Reduction in emissions

4.56.1 Block A: Forecast Outputs

This output is related to outcome 1.34 Net Zero Emissions. There are no outputs within reduction in emissions currently, due to programme maturity. This will continue to be developed between draft and final business plan submission.

4.56.2 LTIS

This demand has been front end loaded to ensure compliance with the directive and achieve the carbon target.

4.56.3 Block B: Capital Expenditure

There is no SR27 forecast investment for Reduction in emissions specifically as this is currently captured across various programmes. More details are held in the Net Zero Technical Appendix.

4.57 Line reference 2.58 - Other enhancement expenditure

4.57.1 Block A: Forecast Outputs

Table 39 2.58 - Other enhancement expenditure (below) details the needs that contribute to WICS Data Table 5 projects and programmes that do not deliver any of the outputs defined between 2.1 and 2.57 and have therefore been consolidated within other enhancements.

Table 40 2.58 - Other enhancement expenditure

Investment Name	**Forecast Acceptance (Gate 100)**	**Need**	**Investment Hierarchy**	**Need Description / Investment Driver**
MA037 Castle Moffat CWT	N/A	544	Cat 2a - Regulatory	Assess 50-100 tanks to determine if new bypass arrangements are required to enable future inspection/repair work.
Assess 50-100 tanks to determine if new bypass arrangements are required to enable future inspection/repair work.	N/A			
Construct and pilot standard product.	N/A	549	Cat 3a	Construct and pilot standard product.
Assess peatland restoration options at all 20 catchments.	30/09/2026	553	Cat 2 - Regulatory	Assess peatland restoration options at all 20 catchments.
Tankers and tanker fill points to meet peak capacity at small WTW	N/A	606	Cat 3	Tankers and tanker fill points to meet peak capacity at small WTW
Sample around 20,000 additional properties and develop analytical model to assess risk in all properties	N/A	659	Cat 2a - Regulatory	Sample around 20,000 additional properties and develop analytical model to assess risk in all properties
Highland PFI Includes transition to Scottish Water ownership and contractual obligation of fair market value payment	N/A	803	Cat 2 - Commitment	Highland PFI Includes transition to Scottish Water ownership and contractual obligation of fair market value payment

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Mitigations for internal flooded properties Apr 2027 - Mar 2033	N/A	831	Cat 3	Provide protection to customers from the risk of flooding whilst permanent solutions are being identified and implemented
Provide fit for purpose models required as minimum legislative requirement under Flood Risk Management Act	N/A	833	Cat 2a - Regulatory	Provide fit for purpose models required as minimum legislative requirement under Flood Risk Management Act
Reduce and remove storm water in the sewer network in areas to address high priority risk areas of sewer flooding	N/A	839	Cat 3	Reduce and remove storm water in the sewer network in areas to address high priority risk areas of sewer flooding
Edinburgh and Lothians Strategic Drainage Partnership	N/A	841	Cat 3	Support local authorities in delivering high priority surface water flood risk reduction under Surface Water Management Planning (SWMP), taking into account increased flood risk from climate change and trending towards 1 in 30-year flood protection
Metropolitan Glasgow Strategic Drainage Partnership	N/A			
Water Resilient Dundee Partnership	N/A			
Support local authorities in delivering high priority surface water flood risk reduction under Surface Water Management Planning (SWMP), taking into account increased flood risk from climate change and trending towards 1 in 30-year flood protection	N/A			
Increase network intelligence - Roll out intelligent network	N/A	863	Cat 2b - Regulatory	Increase network intelligence - Roll out intelligent network

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
technology in [5] priority catchments. Help move from reactive to proactive approach				technology in [5] priority catchments. Help move from reactive to proactive approach
Innovation (inc. Chair) 01 - R&I Programmes	N/A	889	Cat 3	Innovation
SR21 Juniper House Refurbishment	N/A	891	Cat 2 - Commitment	Continue provision of an accredited laboratory service
Block Line Juniper House - Worst case new build LBE difference	N/A			
Continue provision of an accredited laboratory service - Top-down adjustment	N/A			
Provision to develop plans for extending and/or tailoring market research programme to support the outcomes for SR21	N/A	895	Cat 3	Provision to develop plans for extending and/or tailoring market research programme to support the outcomes for SR21
Develop plan and programme to introduce more automated self-service to improve the speed and quality of response for customers. Develop plan and programme to enable customers to track the progress of their enquiry. Develop plan to introduce AI tools where	N/A	899	Cat 3	Develop plan and programme to introduce more automated self-service to improve the speed and quality of response for customers. Develop plan and programme to enable customers to track the progress of their enquiry. Develop plan to introduce AI tools where
Improve response to priority service customer groups during an incident	N/A	901	Cat 3	Improve response to priority service customer groups during an incident

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Co-create tailored support plans. Develop specifically trained and trusted employees. Develop a priority service register.	N/A	903	Cat 3	Co-create tailored support plans. Develop specifically trained and trusted employees. Develop a priority service register.
Education campaigns targeted at customers in sewer choke hot spot areas	N/A	907	Cat 3	Education campaigns targeted at customers in sewer choke hot spot areas
Sustainability auditing / review of Scottish Water assets and estates to support future action and inform future investment planning	N/A	923	Cat 3	Sustainability auditing / review of Scottish Water assets and estates to support future action and inform future investment planning
Sustainable Growth Agreement - Deployment of demonstrators and catchment trials	N/A	931	Cat 3	Sustainable Growth Agreement - Deployment of demonstrators and catchment trials
Developing and delivering environmental sustainability monitoring, reporting, and communication with customers and stakeholders	N/A	933	Cat 3	Developing and delivering environmental sustainability monitoring, reporting, and communication with customers and stakeholders
Build water research and development capacity in Scotland s Universities	N/A	1258	Cat 2 - Commitment	Build water research and development capacity in Scotland s Universities
Renewable Energy Enhancement (New) - N2252	N/A	2252	Cat 3	Host renewable energy generation at SW assets
Host renewable energy generation at SW assets	N/A	2252	Cat 3	Host renewable energy generation at SW assets
Bathing Waters - Lower Largo	N/A	2255	Cat 2 - Commitment	Improve Bathing Water at Ayr South
Improve Bathing Water at Ayr South	06/08/2027	2255	Cat 2 - Commitment	Improve Bathing Water at Ayr South

Investment Name	Forecast Acceptance (Gate 100)	Need	Investment Hierarchy	Need Description / Investment Driver
Ringfenced value fixed by FD (Lighthouse projects - Craigleith, River Almond, St Marys)	13/02/2030	2322	Cat 3	Ringfenced value fixed by FD (Lighthouse projects - Craigleith, River Almond, St Marys)
Ringfenced - Craigleith Lighthouse - Block Line 5x £5m	N/A			
Enhanced response after flooding incidents	N/A	2407	Cat 3	Develop enhanced response for sewer flooding (response kits and flood guards) including specialised clean-up for agricultural land
New provision of permanent standby generators	N/A	2431	Cat 3	Provision of New Standby Power
Provision of New Standby Power	N/A			
We Enhance Scotland's Environment 14 - Overspill / Block Line	N/A	2837	Cat 3	Net Zero Emissions - Trial low carbon construction materials and construction techniques to reduce the emission intensity of investment.
Net Zero Emissions - Trial low carbon construction materials and construction techniques to reduce the emission intensity of investment.	N/A			
Allanfearn WwTW - Treatment and bioresource	N/A	3290	Cat 2 - Commitment	Highland PFI - Sludge

4.57.2 LTIS

The breakdown of demand includes other Business support ongoing activities including innovation, customer insights, PFI contract payments and unallocated investment not currently assigned to the other lines in DBP Table 2. Work is on-going to disaggregate and map to the relevant lines or activities held in the line under SR27.

4.57.3 Block B: Capital Expenditure

The SR27 forecast investment for Line reference 2.58 Other enhancement expenditure is £361.133m.

These investments do not meet the definition of any row between 2.1 and 2.57 and have therefore been consolidated within other enhancements.

There is investment of £361M which accounts for 11% of the total enhancement and growth expenditure held within this row. This encompasses the 28 needs detailed in Table 39 , the most significant investments are in the following areas :

- £104m to Upgrade SW Laboratory at to maintain accreditation.
- £61m on surface water initiatives working in partnership (including with local authorities) forecasting to deliver 4 surface water management schemes across Edinburgh and Lothians, Metropolitan Glasgow and Dundee as well as other high priority surface water flood risk areas.
- £31m on standby power improvements installing standby equipment across 52 sites.
- £22m for renewable energy generation, forecasting to assess 56 sites for potential renewable energy generation
- £21m for innovation delivering 76 studies. (which are currently not yet defined)

Scenario B includes increased investment of £61m which is captured in this row to promote community driven, place-based schemes that keep rainwater on the surface; by providing a seed fund for partnership work (inc. with local authorities) this is in strong alignment with our long-term strategy outcomes.

Scenario C doesn't include any investment on new renewable energy reducing expenditure by £10m, which will significantly increase investment required in SR33 to hit Net Zero by 2040.

4.58 Line reference 2.60 – Total

The total capital expenditure for SR27 is £3,343,713. Scenario B is £3,581,372 and Scenario C is £3,121,916.

Table 2: Developing SR27 Outputs

Appendix A

Contents

1 Developing the Bottom-Up SR27 Outputs & Investment

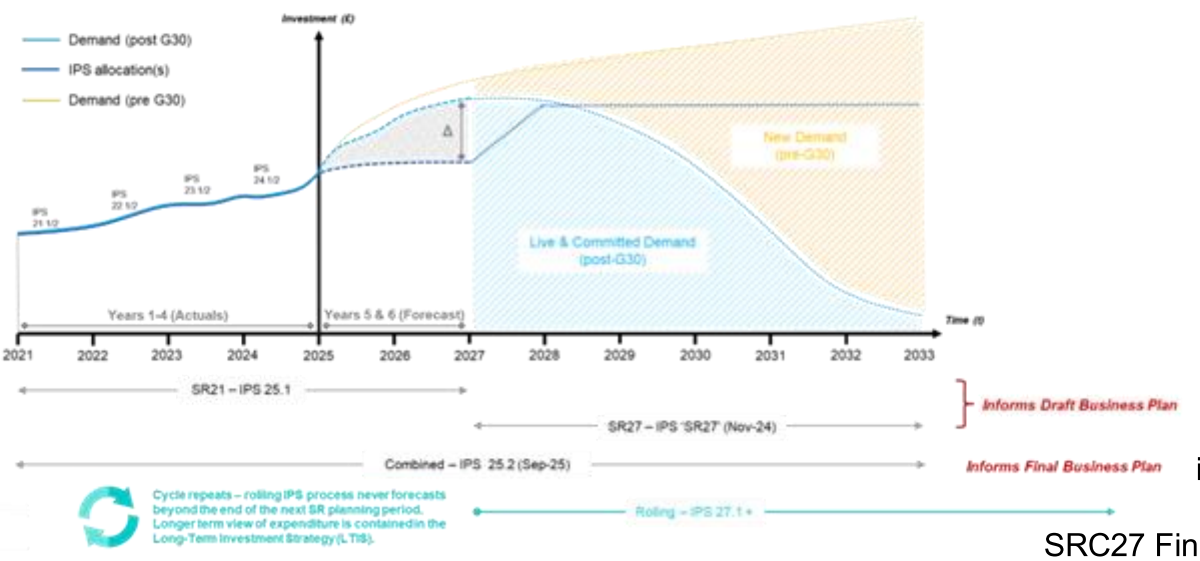
Scottish Water now operates a rolling investment portfolio as shown in the figure below. This is a more rigorous and dynamic approach than used previously.

This approach allows for the continual incorporation of the latest evidence into decision-making processes, collaborating with stakeholders to ensure the costs and benefits of competing investment priorities are balanced appropriately.

Through this improved portfolio approach:

- Potential Needs are identified on a rolling basis.
- Investment Proposals to address those Needs are developed through a stage & gate process tailored to the complexity of the need and the potential cost of the investment.
- The investment itself is sanctioned by officers authorised by Scottish Water's Board through an approved schema for Delegated Level of Authority.
- These decisions are guided either through policy criteria defined in Management Approaches, or through the creation and consideration of bespoke, value-based Project Investment Appraisals.
- Control is maintained through the ongoing monitoring of an Investment Planning Scenario (IPS), which forecasts expenditure toward each Need against proposed allocations which, collectively, are affordable within the parameters of the relevant charge settlement.

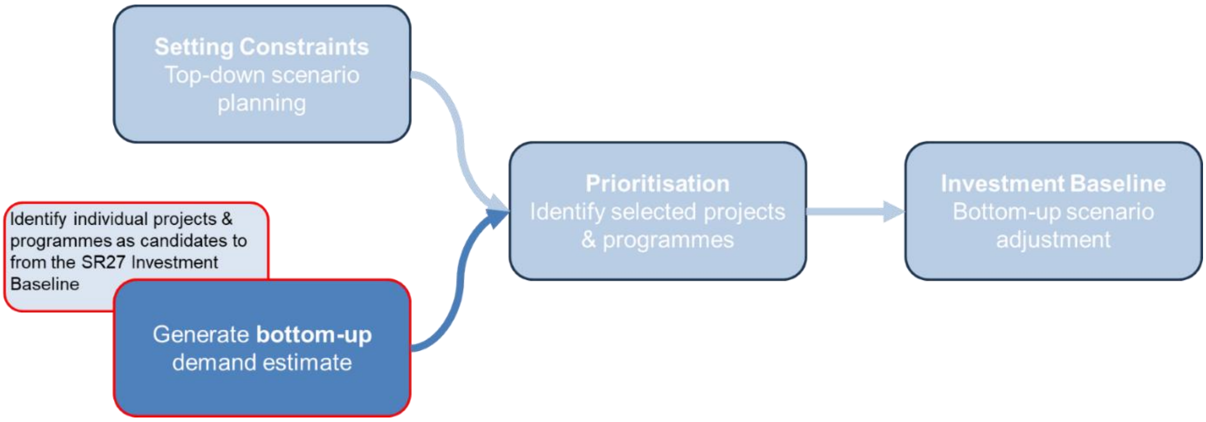
Figure 1 Illustration of the dynamic rolling Investment Planning Scenario (IPS)



In its SRC27 Final Methodology, as shown in the figure below, the WICS recognises the continuing importance of the flexibility afforded by this approach which they established for SRC21, noting the implication for establishing an Investment Baseline for SRC27 that the Investment Proposal contained within it will be at varying levels of maturity and so be uncertain.

The first step in the development of the investment baseline and the recommendation of an Investment Planning Scenario is the to fully understand the potential unconstrained investment demand. This first set is shown in figure 3 below (outlined in red) and is described in the following section.

Figure 2 Overview of the main steps in the development of the investment planning scenarios – focussing on the generation of the bottom-up demand estimate



The Copperleaf system, records, tracks and develops the emerging SR27 investment demand[1]. Any new investments are first added to Scottish Water's systems through Copperleaf.

Downstream of Copperleaf is another system, P3M, used to manage existing live investments, i.e. those investments already promoted into Scottish Water's gateway process.

There are c. 40,000 investment lines in P3M (projects and programmes of work), with considerable data associated with each investment in the system, ranging from project details (such as primary need, funding need, investment hierarchy, intervention type, delivery vehicle), monthly financials (actual vs forecasted spend), to outputs (actuals, forecasts and date expected).

The steps we followed to build up our bottom-up demand were as follows.

1. Management Approach (MA) owners take the overall demand (committed, known and future, as discussed in 4.5.1 above), and break it down into more granular project/programme lines to be entered into Copperleaf (as bottom-up investment demand).
2. All investment lines were matched to the agreed "Investment Need Codes" already used for all live P3M investments.
3. To help them identify SR27 investment demand, MA owners were also provided a cut of P3M data that included post gate-30 investments that already had SR27 spend (indicating these are already lined up for SR27). They were tasked to also come up with additional SR27 demand that was not yet promoted into P3M (new demand).
4. When identifying and specifying investment lines, MA owners considered:

a. The cost of the investment (proposed in line with Project Investment Appraisal (PIA)[2] threshold at that time c£3m)

b. The amount of visibility expected by regulators and industry stakeholders (e.g. phosphorus removal projects, sanitary tightened permit condition projects, storm overflows projects, or water resources projects)

c. The type of choices and trade-offs expected to be made in the programme area;

d. The gate stage of the investment proposal; and,

e. The maturity of the needs at a site level – i.e. what is it practicable to show?

5. Environmental Planning Assurance (EPA) Service Planners[3] then entered these bottom-up unconstrained project and programme investment lines into Copperleaf. These were a combination of new demand, and existing P3M demand with SR27 spend, and included the necessary meta data, e.g. investment line, alternatives, draft capital expenditure forecasts, and outputs. This is to create the initial bottom-up investment demand view.

6. With all investment demand in the system, Copperleaf can then be used to optimise investment plans, drive stakeholder engagement and assess alternative investment scenarios.

These next steps are set out in the following section.

Figure 3 Use of Copperleaf in developing SR27 Investment Baseline

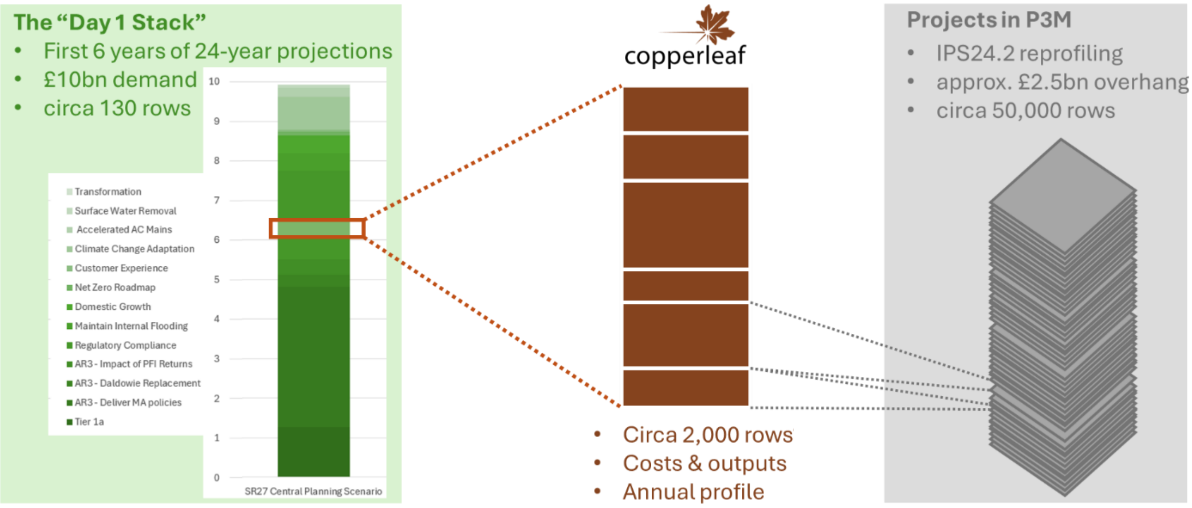


Figure 4 Outline timetable and maturity assessment from the basis of a Service Planner working in Copperleaf

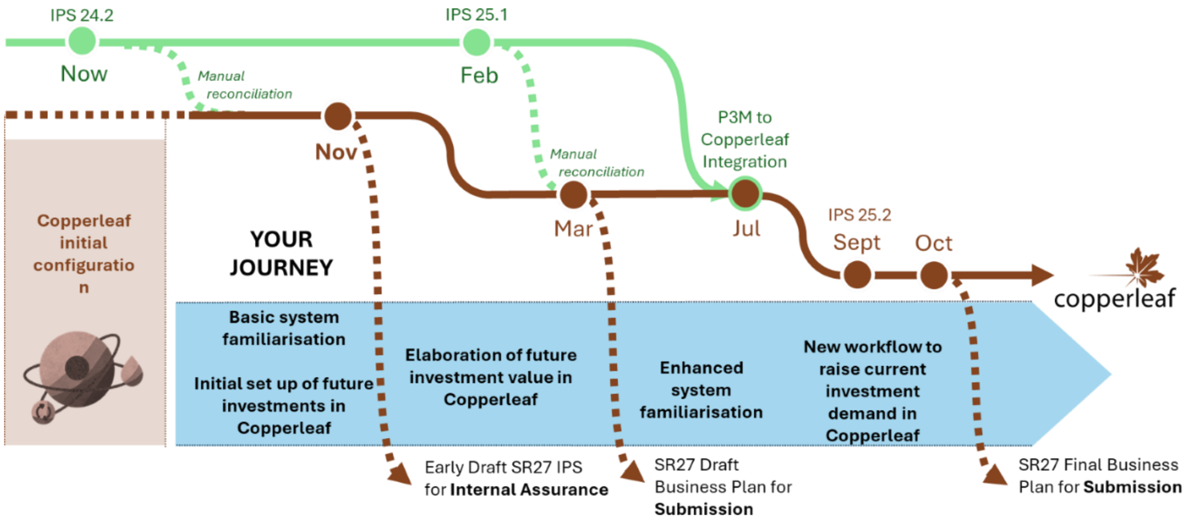
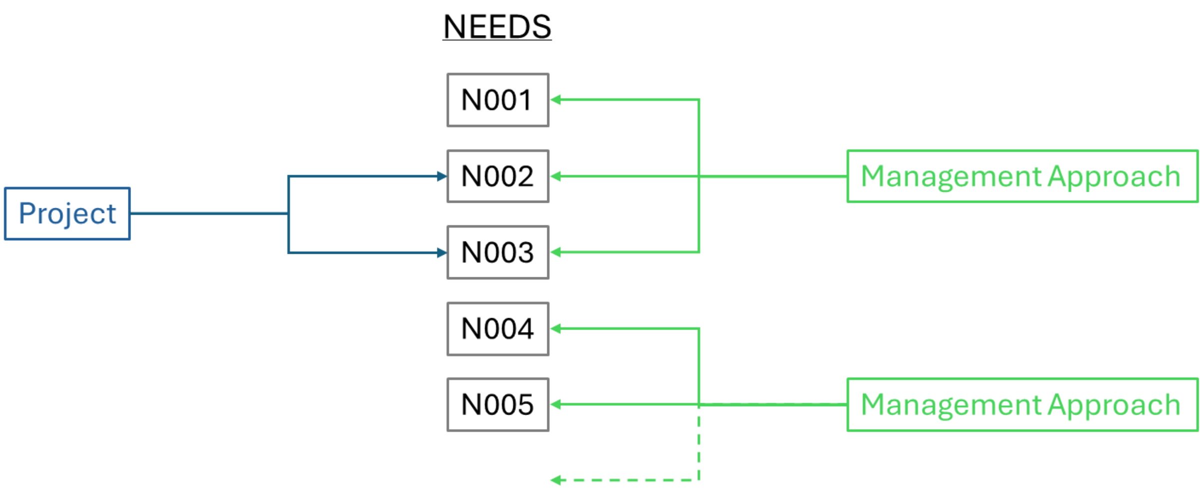


Figure 5 What is a Need? Needs define: Spend type, Portfolio, and Investment Hierarchy, and indicate the expected Outputs that will be delivered.



1.1 Our Demand Approach

There are 3 categories for Investment, all 3 categories form the total investment of demand. Each of these categories may exist across every programme area and – for the purposes of consistency and so later prioritisation of which investment demands to address – should be assessed according to common principles and methods.

The three categories are:

Committed Demand: Post-G90 – Where the investment demand and solution are already well understood, and commitment to delivery has already been given.

Known Demand: G30-G90 demand – Where the investment demand is confirmed according to agreed organisational policies with options to address it under development, and so no commitment to delivery have yet been given.

Allocations: Pre-G30 demand – Where the investment demand does not yet exist, but an allowance is made for expected future investment demands according to agreed organisational policies. These will ordinarily be based upon analytical modelling or assessment of historic run-rates.

1.1.1 Assessment of Committed Demand

For Committed demand, there is an assumption that all proposed investments will have required a Project Investment Appraisal (PIA). In this case it is expected that:

- The information required will already be available in the appraisal document where it has been prepared in accordance with existing appraisal guidance.
- Each investment line will have a 1-2-1 relationship with a Project in P3M and the data will be synchronised (with the exception of the cost base for reporting).
    - For the draft plan, the synchronisation was based upon P10 data in P3M, extracted in early February 2025
    - For the Final Business Plan, the synchronisation will be established through technical integration between P3M and Copperleaf under Programme ORBIT.
- The investment lines will include all proposed projects past G90 where all or part of the committed expenditure profile falls within the period 2027-2033. The expenditure relevant to the SR27 Business Plan will be only the expenditure profiled to fall within the period 2027-2033

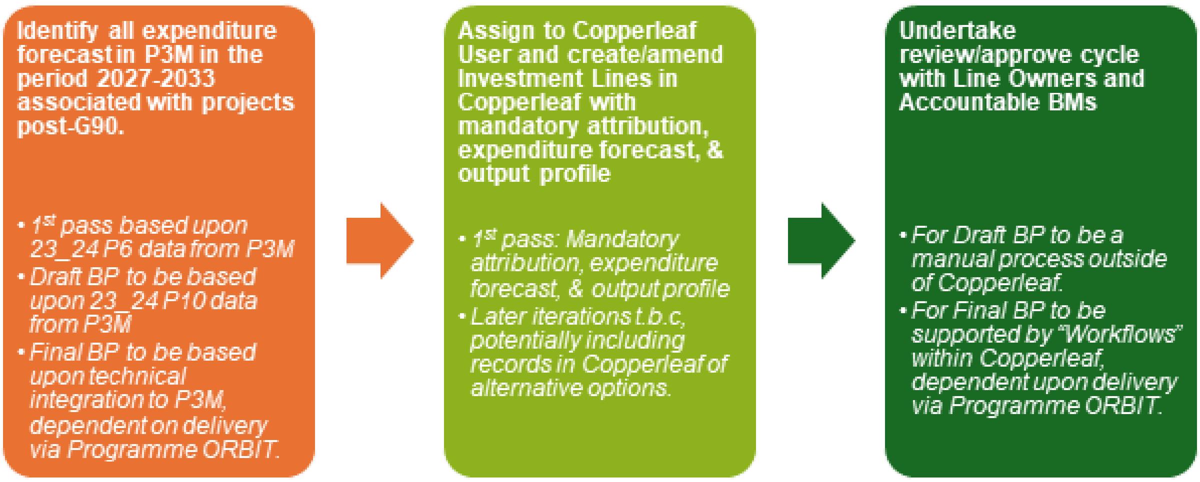
Scottish Water operates a rolling investment portfolio and, as such, the process for assessing and recording all categories of Investment Demand must be equally dynamic.

In practice, this requires an approach which:

- allows and encourages the continual refinement of Investment Demand
- continually reviews the categorisation of Demand as individual Investment demands progress through the usual lifecycle
- has clearly planned "lock-down dates" for data extract and analysis from the Copperleaf AIP database for responsible people to work towards.

Without aiming to explore all these essential features in detail, the broad process through which the assessment of Committed Demand follows is:

Figure 6 Overview of the process to assess the Committed Demand



1.1.1.1Assumptions

- everything in this category at the time of Business Plan submission will have a PIA as it is only large projects which are likely to overhang into SR27 at that point.
- existing PIA evidence base is satisfactory.
- Copperleaf Value Framework can be easily applied to existing post-G90 PIAs without further appraisal effort required.

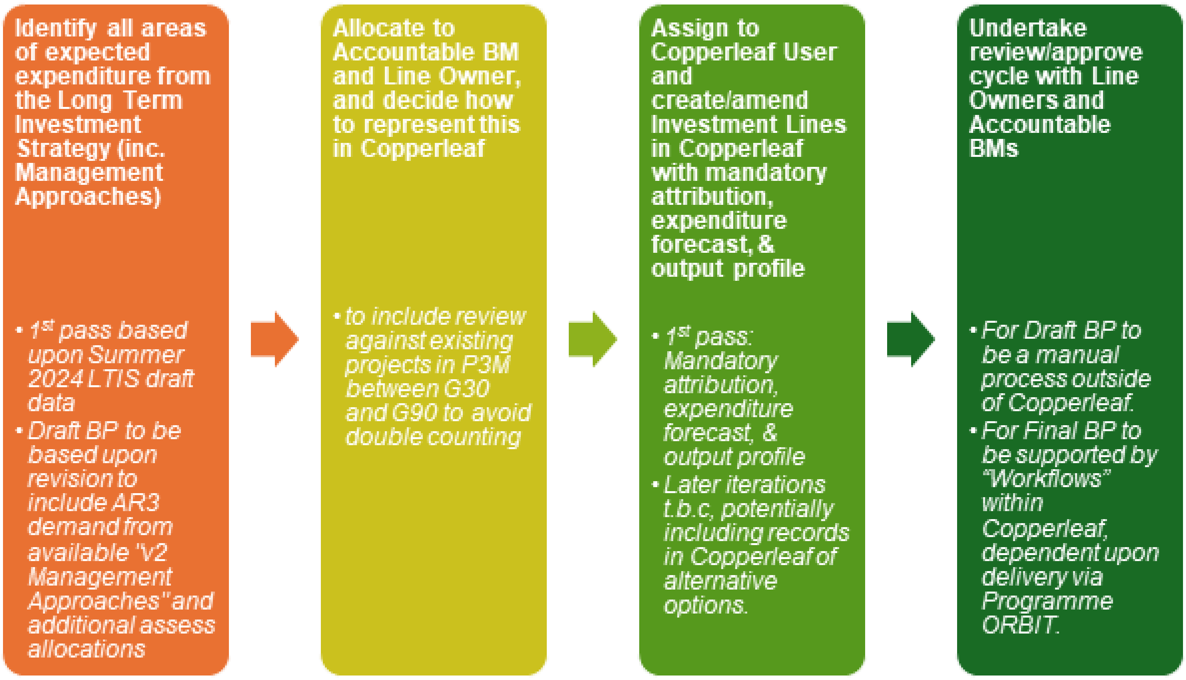
1.1.2Assessment of Known Demand

For Known demand, there is an assumption that all proposed investments will be either:

- costly/novel/contentious enough to have passed the threshold to require a Project Investment Appraisal, and in this case, it is expected that:
- The information required will already be available in the appraisal document where it has been prepared in accordance with existing appraisal guidance.
- Each investment line will have a 1-2-1 relationship with a Project in P3M and the data will be synchronised (with the exception of the cost base for reporting).
  - For the draft plan, the synchronisation will be based upon P10 data in P3M, extracted in early February 2025, adjusted to as required to be broadly representative of IPS 25.1.
  - For the Final Business Plan, the synchronisation will be established through technical integration between P3M and Copperleaf under Programme ORBIT.
- The investment lines will include all proposed projects between G30 and G90 where all or part of the planned expenditure profile falls within the period 2027-2033. The expenditure relevant to the SR27 Business Plan will be only the expenditure profiled to fall within the period 2027-2033
- Low-value investment demand developed but not prioritised for delivery in SR21, and so with relevant deliverables from the existing PPD process, depending upon the complexity and Gate stage of the Investment available.

Without aiming to explore all of these essential features in detail, the broad process through which the assessment of Known Demand follows is:

Figure 7 Overview of the process to assess the Known Demand



1.1.2.1Assumptions

- Relevant deliverables from the existing PPD process, depending upon the complexity and Gate stage of the Investment, will form suitable evidence base.
- Copperleaf Value Framework can be easily applied to existing Known investment demands without further analysis effort required.

1.1.3Assessment of Allocations

For Allocations, the assessment will either be based on a "run-rate" methodology, or use a more sophisticated form of analysis.

Where a **run-rate** approach is used, evidence recorded will include:

- The source and scope of historic information used to inform the assessment
- Commentary on the completeness and quality of historic records
- Commentary on any factors that reasonably suggest future trends should differ from historic trends.
- A complete record of quantitative adjustments made to the level and/or trend in historic investment demand used to make the forward assessment of investment demand for the Allocation in the period 2027-2033.

Where a **more sophisticated form of analysis** is used (for example, Scottish Water Level 2 AR3 models)[4], evidence recorded will include:

- A summary methodological document outlining the approach to the analysis, its intended purpose and limitations and references to artefacts that would allow a suitably skilled and experienced analyst to recreate the analysis.
- Documentation of the data required for the demand analysis (including model parameters where relevant).
- Copies of the data used in the analysis (including model parameters where relevant).

- Information, where available, to support an assessment of the calibration of the analysis to real-world observation.

For Allocations, in general there will be no equivalent entity in P3M, and so there will be no requirement for synchronisation with P3M.

The broad process is as above for the Assessment of Known Demand

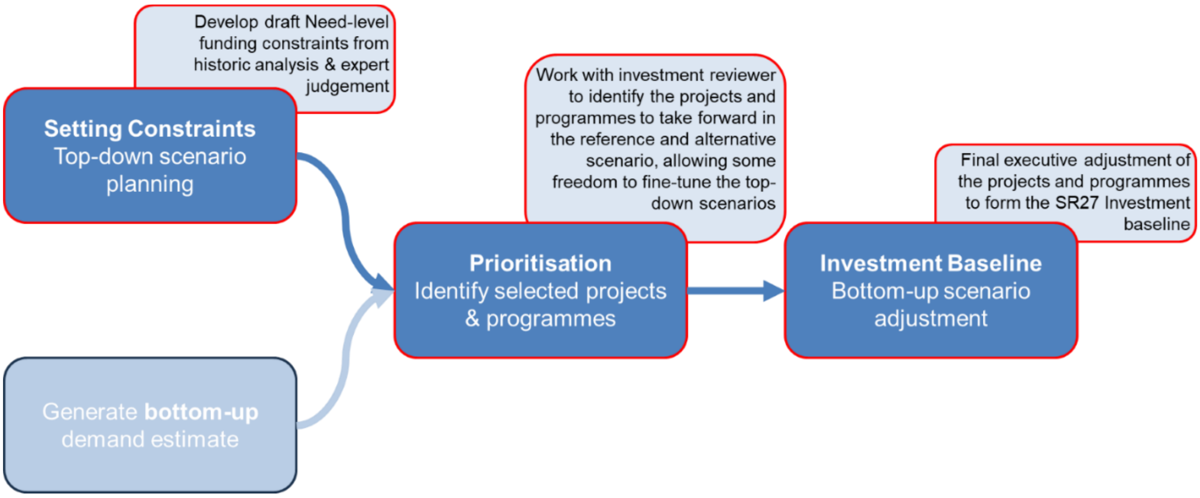
1.1.3.1 Assumptions

- Existing run-rate / analytical modelling methodologies and documentation is satisfactory
- Copperleaf Value Framework can be easily applied to existing Allocations without further analysis effort required.

2 Developing the Top-Down Scenarios

The approach builds on demand approach described in the previous section, and focusses on the highlighted (red outline) steps in the process set out in below.

Figure 8 Overview of the main steps in the development of the investment planning scenarios – focussing on the three steps leading to the development of the investment baseline



2.1 Setting constraints

Applying constraints to the investment planning scenarios is a critical step in ensuring that what we recommend for SR27 is firmly grounded in the "real-world". The recommended scenario must fall within a *zone of acceptability,* where it is:

- **Feasible** – it maintains service and meets Ministerial Objectives
- **Affordable** – would the resulting customer charges be affordable, acceptable and fair?
- **Deliverable** – the work required is achievable by the supply chain available to us, and fully considerate of competing supply chain demands for other infrastructure players in Scotland and beyond.

The objective is to determine the precise scale of the feasible and affordable scenarios; quantifying the full investment envelope and then prioritising those investment Needs from the bottom-up exercise that should be included within the scenario to deliver the optimal service outcomes.

The initial step involved generating a comprehensive suite of scenarios that would encapsulate various potential outcomes and investment needs. This included an estimate of the necessary investment demand to meet the current draft SR27 Ministerial Objectives, covering legislative requirements, commitments to stakeholders, and customer priorities.

- **Step 1** - Create an unconstrained demand as described in the previous section. This is the full list of demands; and provides the starting position for our further consideration of what other efficiencies[5] could be achieved to meet all these demands. In this step, the initial estimates were rigorously challenged and adjusted considering potential efficiencies. This involved an extensive review of demand forecasts and cost assumptions, incorporating feedback from internal and external stakeholders to refine the scenarios.
- **Step 2** - The second step was to identify the upper and lower boundaries of the central *zone of acceptability*.

- **Step 3** - The third step was to identify and document the full list of exclusions and consequences of any scenarios that fell below the central *zone of acceptability*, and to articulate the impact on services (e.g. what would not get done?) and increased risks of these infeasible options. The infeasible options include frozen charges (no indexation), and flat charges (CPI indexation only, no additional increases).

This approach identified the mid-point scenario, and from there provide two additional alternative scenarios as required by WICS.

The mid-point scenario (to become our recommended scenario) is a level of investment that can provide the minimum level of service that still meets the Ministerial Objectives. Below that is a scenario that would maintain today's overall service levels, but would put compliance with Ministerial Objectives at greater risk. And the scenario above the mid-point would achieve good progress in service levels and compliance with the Ministerial Objectives.

2.2 Prioritisation

The main prioritisation workstream utilised this insight into service choices and the existing Investment Hierarchy from SR21 to prioritise the investments for the Reference Scenario and the Alternative Scenarios.

The three main steps we followed were:

1. **Translate an overall financial constraint into draft Need level allocations.** Working in Copperleaf with our EPA Service Planners and other investment reviewers to set up the scenarios and input the capital expenditure constraints, as we move from our initial and preferred scenarios down to the Reference and Alternative scenarios, splitting the investment across all the different funding Needs. This step will synthesise information from the existing rolling investment portfolio and LTIS, and as such address issues of deliverability and customer value.
2. **Identify an initial set of priority projects and programmes to be delivered for those allocations from an assessment of total Investment Demand**. Informed by Management Approach owners and detailed knowledge of stakeholder preferences held by SW people accountable for these stakeholder relationships to "tag" investments in Copperleaf to different scenarios. (i.e. which investments in a particular Management Approach would you do it you had £x versus £y).
3. **Undertake a single adjustment of these selected projects and programmes, subject to executive approval, to form the SR27 Investment Baseline.** This step accounted for the differences between known project and programme costs and those assumed in the LTIS, along with any known material risks and opportunities. It also considered the potential collective impact of the scheduling of individual large projects and programmes.

This workstream delivered a tagged dataset recorded in Copperleaf representing:

- A baseline scenario of the Investment Demand that is planned to be satisfied in case of the Reference Scenario (the "SR27 Investment Baseline"),
- Changes to that baseline in the event of Alternative Scenario 1; and,
- Changes to that baseline in the event of Alternative Scenario 2.

2.3 Investment baseline

Finally once the final selection of projects and programmes had been prioritised and optimised, they were presented to the Board to ensure that the investment planning scenarios had the necessary executive endorsement and alignment with organisational strategy.

This rigorous process of discussion and reassessment ensured that the proposed investments were not only viable but also optimised to address the most pressing demands and future growth. Stakeholder engagement played a pivotal role, offering diverse perspectives that enriched the decision-making process and highlighted potential areas of risk and opportunity.

A thorough review by the Board was undertaken, where the proposed Reference Scenario was scrutinised to ensure that it aligned with the overarching strategic direction of Scottish Water, aligned to the water Sector Vision. This step also involved detailed presentations and discussions around the implications of the chosen scenario, including financial forecasts, an understanding of the risk, and expected outcomes.

Following the Board review, adjustments were made based on feedback, ensuring that the final Reference Scenario was robust and well-supported across all levels of the organization. This comprehensive review process bolstered the scenario’s credibility, making it a solid foundation for the Business Plan.

Table 2: Developing Long Term Strategy

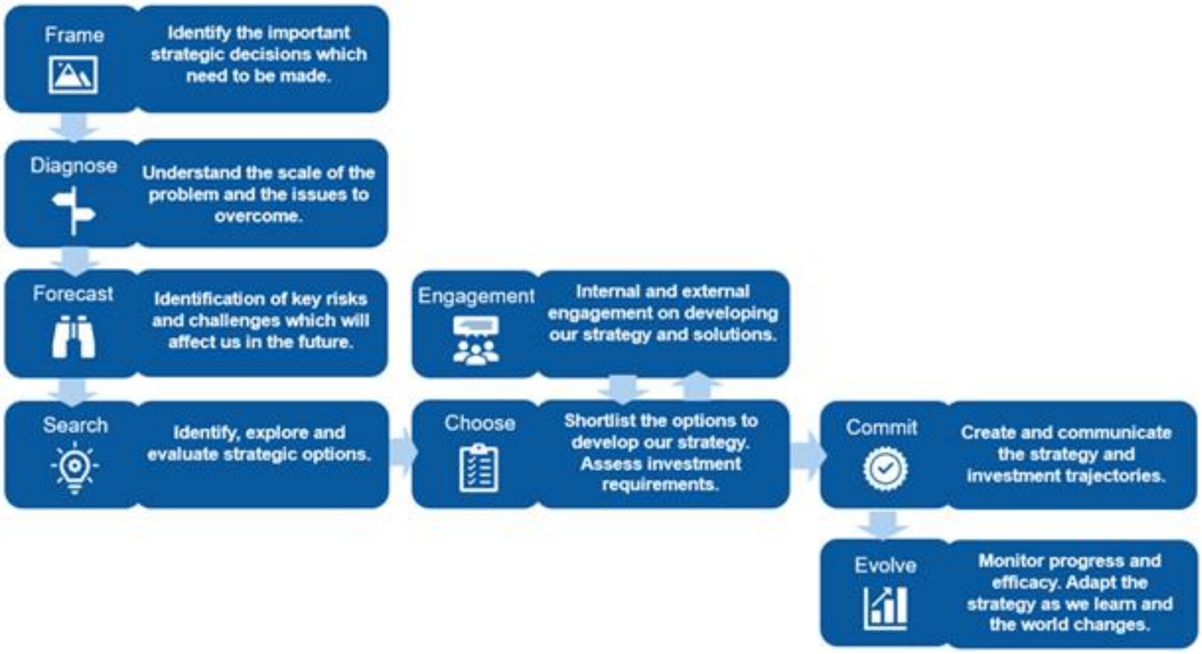
Appendix B

Contents

1 Developing the long-term investment strategy

The LTIS ensures that we can continue to deliver the Long-Term Strategy (LTS) - to provide reliable water and wastewater services over the next 25 years in addition to meeting the expectations of our customers, regulators, Scottish government and our board. This section outlines the process, rationale, and decision-making framework used in the development of our long-term investment strategy. Setting out the high-level sequential process we have followed in developing our long-term investment strategy. The demand used in the long term projection for the SR27 Business plan and that support the May 25 long Term Strategy are based on 2024 values. These will be reviewed annual and refreshed for the next revision of the Long Term Strategy.

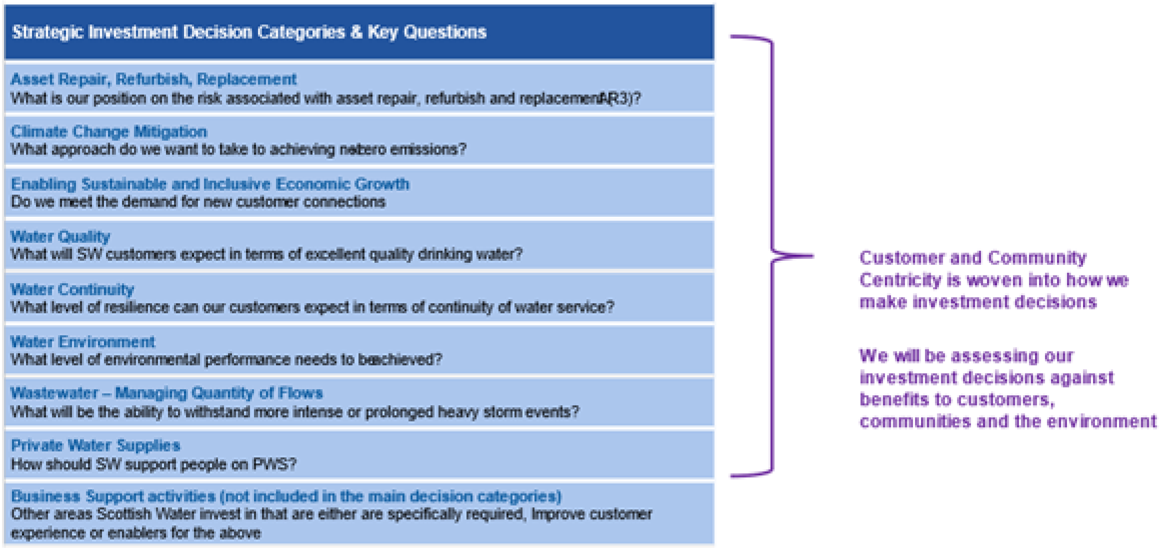
Figure 1 Setting out the high-level sequential process we have followed in developing our long-term investment strategy



1.1 Frame

The initial stage of the process was to identify the investment areas where there are strategic decisions to be made. Using the water sector vision and our existing operating structure, we created 8 strategic decision categories which cover the breadth of the business. See Figure 2 for each of the 8 categories we identified the strategic outcome which would represent achievement of the Water Sector Vision, against which we can assess our current performance. This provides an initial view of the challenge to be addressed - to close the gap between our current performance and our aspirational performance - and formed the basis of our Strategic Investment Table (SIT) figure 5 shared at the Strategic Advisory Group (SAG) in June 2023. The performance gap is broken down into 3 progressive outcomes, so that each step represents progress towards the WSV (see figure 3). We further considered the possibility of deterioration in the event of under-investing in specific areas, which is represented by negative positions on the SIT. There was an addition category "Business Support" that captured business as usual activities where there was either no choice or where investment was significantly smaller than in the main 8 categories.

Figure 2 Strategic Investment Decision Categories (the main categories that have a material impact on investment strategy



Strategic Investment Decision Categories & Key Questions
Asset Repair, Refurbish, Replacement What is our position on the risk associated with asset repair, refurbish and replacement (R3)?
Climate Change Mitigation What approach do we want to take to achieving net zero emissions?
Enabling Sustainable and Inclusive Economic Growth Do we meet the demand for new customer connections
Water Quality What will SW customers expect in terms of excellent quality drinking water?
Water Continuity What level of resilience can our customers expect in terms of continuity of water service?
Water Environment What level of environmental performance needs to be achieved?
Wastewater – Managing Quantity of Flows What will be the ability to withstand more intense or prolonged heavy storm events?
Private Water Supplies How should SW support people on PWS?
Business Support activities (not included in the main decision categories) Other areas Scottish Water invest in that are either are specifically required, Improve customer experience or enablers for the above

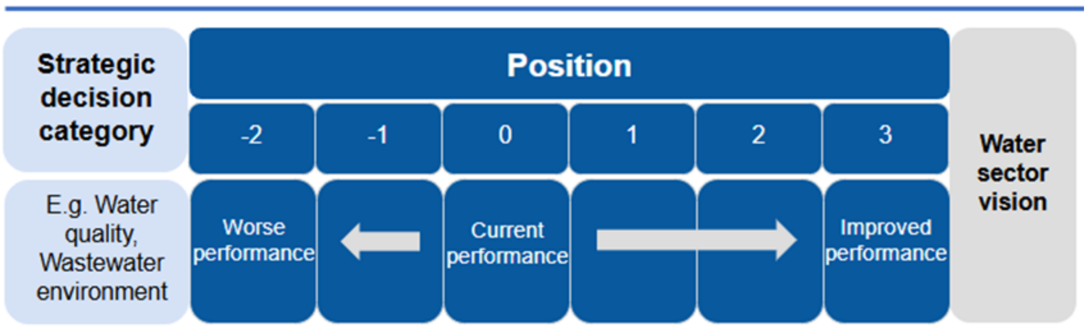
Customer and Community Centricity is woven into how we make investment decisions

We will be assessing our investment decisions against benefits to customers, communities and the environment

The needs were groups into

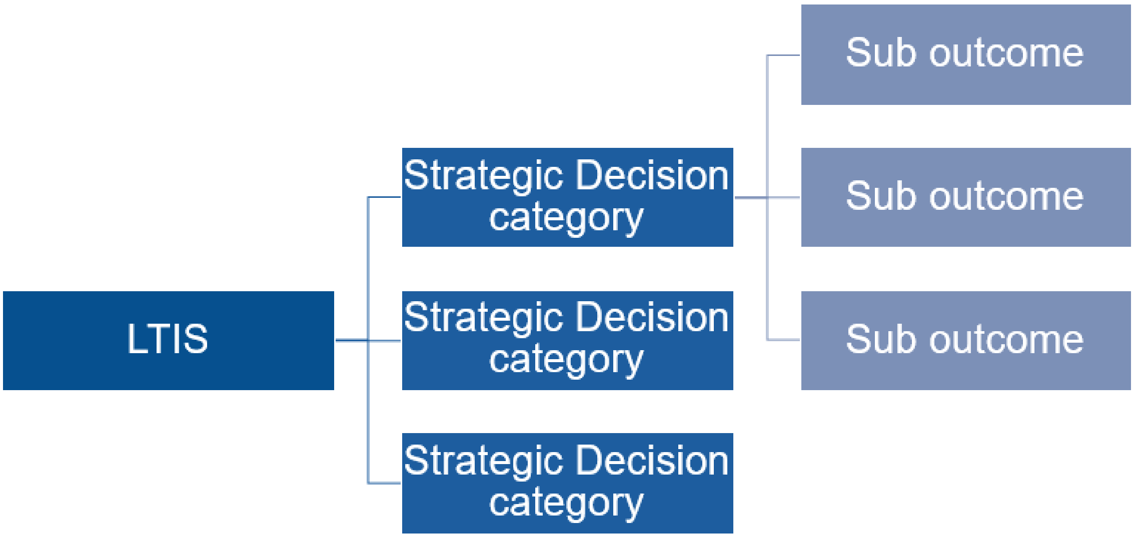
- Required to maintain current position
- Required to meet current legislation
- Required to meet an agreed policy position
- Required to make significant progress towards the Water Sector Vison

Figure 3 Relationship of sub-outcomes to LTIS



The strategic decision categories cover several investment areas where there are interdependencies in the delivery of outcomes. More granular divisions, with more specific 'outcomes' were identified for each service outcome, all of which support delivery of the service outcome. These sub-categories are labelled 'sub-outcomes'. Figure 4 shows the relationship.

Figure 4 Relationship of sub-outcomes to LTIS



The analysis underpinning the long-term strategy is largely carried out at the sub-outcome level.

The SIT provides a framework which has been used to establish key strategic positions and the impact on the level of investment. We have further used the SIT as a tool for *discussion* and engagement with internal stakeholders and to support decision-making.

Figure 5 Strategic Investment Table: 2050 (v 30/06/2023)

Strategic Investment Decision Category	Key Question	-2	-1	0	+1	+2	+3
Asset Repair, Refurbish, Replacement	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Climate Change Mitigation	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Enabling Sustainable and Inclusive Economic Growth	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Water Quality	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Water Continuity	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Water Environment	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Wastewater: Managing Quantity of Flows	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Private Water Supplies	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]

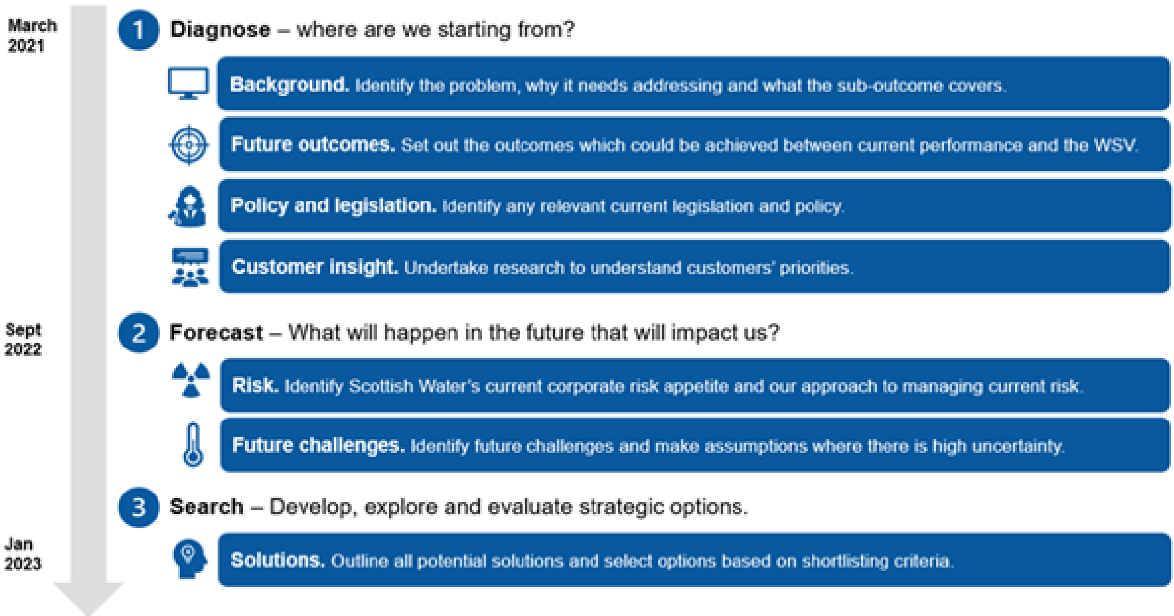
General principles

- maintain an equal service and charge across Scotland based on current charging structure
- comply with current legislation and ministerial objectives
- Other organisations will have incentives to work in partnership with Scottish Water to resolve issues such as reduced water availability or manage surface water.

1.2 Diagnose

In order to make strategic choices it is important we understand the implications and long-term impact of the various options. Under the 'Diagnose' heading, we took steps to better understand of the scale of what may impact Water and Wastewater services over next 25 years (Figure 6).

Figure 6 Investment strategy process; setting out the background



This was done at the sub-outcome level to provide us with the necessary detail to identify the root cause of the threats and opportunities and identify potential solutions, whilst also providing an accurate view of costs and benefits.

We undertook a systematic review of each sub outcome. For each sub-outcome area, we engaged subject matter experts to collate background material to identify the key issues and cause. This enabled us to identify any areas of overlap between different sub-outcomes and clearly allocate needs. We worked with teams and stakeholders to derive proportionate steps from our current performance to the Water Sector Vision and agreed on the outcome that each step would deliver.

1.2.1 Policy and legislation

1.2.1.1 Statutory duties

Scottish Water operates within a regulated sector with a clear legal framework. For each sub-outcome area, we have outlined our statutory duties and identified the level of investment required to meet these. We recognise that there are likely to be changes and amendments made to these over the 25-year period, for example after Scottish Government determines how to align with the recast Urban Wastewater Treatment Directive (UWWTD), however, we assume that any changes requiring material investment will be provided for through the cyclical review of this long-term investment strategic framework / process. It has also been assumed that there are no significant changes to directions give in Ministerial Objectives for SRC21. The key pieces of current legislation are listed in table 1 below.

Table 1 Key pieces of current legislation

Legislation	**Summary**	**Link**
The Water (Scotland) Act 1980	This act lists most of the powers and duties associated with supplying drinking water in Scotland.	Water (Scotland) Act 1980
The Public Water Supplies (Scotland) Regulations 2014 (as amended 2017 and 2022)	These are Scotland's main regulations governing the quality of water supplied by Scottish Water.	The Public Water Supplies (Scotland) Amendment Regulations 2022
The Scottish Water (Objectives: 2021 to 2027) Directions 2020	Directions given to Scottish Water by Scottish Ministers, outlining objectives for the water industry from 2021 to 2027.	Scottish Water: directions 2020 - gov.scot
Security and Emergency Measures (Scottish Water) (Scotland) Directions 2019		
Ministerial Objective Supporting Sustainable Economic Growth: Under the Water Industry (Scotland) Act 2002	Scottish Water is required to provide strategic capacity for new developments (water resources and treatment works).	Water Industry (Scotland) Act 2002
Provision of Water and Sewerage Services (Reasonable Cost) (Scotland) Regulations 2015	Make provision for determining the points to which Scottish Water must take water supply pipes and public sewers so as to enable connections to be made at reasonable cost.	The Provision of Water and Sewerage Services (Reasonable Cost) (Scotland) Regulations 2015
Principles of Charging for Water and Sewage Services 2021-27	Ensures stable, fair, and full-cost recovery charges, support for vulnerable customers, and environmental sustainability.	Water services - charging principles: 2021 to 2027 - gov.scot
Urban Wastewater Treatment Directive (UWWTD), revised in 2025 (rUWWTD)	Sets out requirements of the collection, treatment and discharge of wastewater in the European Union.	Directive (EU) 2024/3019 of the European Parliament and of the Council
Flood Risk Management Act 2009	The act identifies all the parties involved in mapping, understanding, planning and preparing for flood risk. The main objective of the act is to sustainably manage and reduce flood risk from all sources.	Flood Risk Management (Scotland) Act 2009

1.2.1.2 Ministerial Objectives

Scottish Government Ministerial objectives set out two key objectives regarding the long-term water sector vision; (i) to lead work with partners (such as stakeholders, its supply chain, academia and consultants) and engagement with customers and communities, in order to make progress towards the realisation of the Water Sector Vision and (ii) apply the place principle adopted by the Scottish Government and the Convention of Scottish Local Authorities, by taking an integrated, collaborative and participative approach to decisions about a place's services and assets, in order to maximise the impact of resources and to achieve better outcomes for people and communities in Scotland.

In the development of our Long-Term Investment Strategy we have sought opportunities to deliver solutions in collaboration with partners, considering the location and future changes. In our decision-making we have considered customer priorities and the potential benefits to be delivered to customers, communities and the environment. This has ensured that our strategies prioritise the most cost-effective solutions and reflect customers priorities at this time. In some areas we recognise that as our maturity and experience develops, there will be more we can do to maximise the impact of resources. A key aspect of our strategy is that we will build on our approach over the 25 years.

Guidance for the 2027 Strategic Review of Charges, set out by Scottish Government, have clearly made maintaining current service levels a priority. This expectation includes any necessary adaptations to climate change which are required to maintain our performance. Understanding our current performance against our internal policies and the required investment in maintaining them is the fundamental building block of our investment strategy. The next step is to identify the necessary changes we will need to make to continue providing the same service with increasing temperatures and changing weather patterns (see section 3.3.1.1). This information provides an important view of the required investment to maintain our current level of service and performance over the next 25 years.

1.2.1.3 Scottish Water Internal Policies

Scottish Water has several internal policies, developed to deliver consistent service levels to customers and to ensure the most effective approaches are employed across the business. These policies align the companies' objectives and strategies, taking into account the corporate risk appetite. Several of these policies deal with maintaining a minimum service level or relate to the management of assets.

We have further identified the level of investment required to maintain these policies over the next 25 years. Where we have identified it would be cost-beneficial to go further, we have amended these policies to reflect that. This information provides an important view of the required investment to maintain our current status.

1.2.1.4 Customer Insight

Customer research enables us to ensure that our objectives and investment align with customer priorities. Over the past decade Scottish Water has regularly conducted customer research to better understand customer preferences. This research has included targeted engagement in addition to broader qualitative and quantitative work across multiple service areas. Scottish Water established the 'Independent Customer Group' in 2021 to make sure that customers' and communities' views are considered across our plans and decision making. We have considered this customer research for each sub outcome to understand the relative importance and to help us align our target outcomes with those areas of performance which are most important to customers.

For the Long-term Investment Strategy our customer research has been used to assess the economic and societal benefit of addressing needs in different areas. These benefits have been monetised, which enables us to carry out cost-benefit analysis across a range of solutions. This analysis was done using an in-house Strategic Cost-Benefit Tool (SCBT), which computationally selects those options which deliver the maximum benefits for each sub outcome. This tool has helped us evaluate and understand our investment choices across several service outcomes. It has also supported our decision-making to ensure that Scottish Water's strategic objectives are delivered in a way which maximises the value to our customers, communities and the environment.

1.3 Forecast

To effectively develop plans and strategies for the future it is important that we are aware of the principal risks and challenges to each investment area. This information will inform the needs that have to be addressed, our decision-making regarding the most appropriate strategy to adopt and the level of investment required.

We engaged with strategy teams and subject matter experts to identify the key risks and future challenges in each sub-outcome area in addition to considering the macro-scale risks present to the business. Risk in this context refers to factors which will impede the implementation of our long-term investment strategy, thus pose a risk to failure of service or assets and challenges refer to anticipated changes in our operating environment that we have accounted for in our planning and investment. Scottish Water policy clearly sets out our Board’s view of acceptable and unacceptable risk, and it is important that our future investment maintains acceptable levels.

1.3.1 Risk analysis

Future risks to the projected costs, demand or new needs were identified using the PESTLE framework (Political, Economic, Social, Technological, Legal and Environmental). To challenge ourselves to think more broadly, we referenced our Universe of Risks, which considers the time horizon of each risk and the scale of risk. The key macro-level risks which affect our long-term investment strategy are outlined in table 2. Where we have identified risks we have considered mitigation strategies, however, due to the uncertainty, we have not included additional costing. For example, there is a risk of increases to the cost of materials, however, it would not be appropriate for us to include any anticipated increases in our costing as this would distort the current view of necessary investment.

Table 2: Macro risks identified using the PESTLE framework

Area	Risks (2025-2050)
Political	• Risk of regulatory reform with new policy and regulations. • Global political changes may impact government decisions, government borrowing and available finance.
Economic	• Increases in costs of materials/decreases in availability of materials will impact our investment options and ability to deliver solutions within the anticipated timescales. • Changes in skills availability and supply chain capacity may become insufficient to meet programme needs.
Societal	• Regional population growth and associated demand may vary from current forecasts. • Changes in customer expectations may impact the priorities in our strategy
Technological	• Slow down in innovations, such as AI, or new technologies will challenge our ability to meet some outcomes • Increased threats from cyber-attacks may delay the deployment of new technology
Legal	• Changes in Scottish Water's legal responsibilities
Environmental	• Climate change proceeds at a faster rate may make it more challenging for us to adapt at the same pace. • More stringent environmental regulations may require us to reprioritise our investment

Over the 25-year period, any of the identified risks could have a material impact on our strategy. There is also the likelihood of new risks emerging, which we have not considered. Our cyclical review process will take account of new risks and update these to ensure that our strategy remains relevant and effective.

1.3.2 Challenges

We operate across the whole of Scotland, meaning that our network has the greatest distribution area compared to other water companies in England and Wales, with over 49,000 km of water mains serving over 5 million customers. Scotland benefits from regular rainfall, which has historically meant that our water sources are regularly replenished. However, climate change is starting to affect the regularity of rainfall in addition to the intensity. Longer, drier periods will challenge the quality and quantity of our source waters, and our wastewater networks will have to remove greater quantities of surface runoff than they were designed to receive. Figure 7 summaries these challenges.

Climate change brings the need to adapt to new weather patterns and climatic norms in addition to mitigating our impact on greenhouse gas emissions. Scotland benefits from regular rainfall, which has historically meant that our water sources are regularly replenished. However, climate change is starting to affect the regularity of rainfall in addition to the intensity. Longer, drier periods will challenge the quality and quantity of our source waters, and our wastewater networks will have to remove greater quantities of surface runoff than they were designed to receive.

Across all areas of our long-term investment strategy we have considered how climate change is likely to impact our performance in specific areas. Mitigation strategies have been developed and interventions have been considered with adaptation in mind. The uncertainty associated with climate change will mean that our strategy may need to adapt as we better understand the impact on our services and operations.

We have assessed demand against five climate change risks; increased drought, change in rainfall intensity, flooding of assets, dilution rates in rivers and sea leave risk. In several areas there remains a high level of uncertainty regarding the effects, however, where we are more certain, mitigation strategies have been developed.

Based on our climate change risk assessments, we have estimated the associated demand required to maintain our current performance and included this in our cost estimates. The uncertainty in some areas means that our strategy will need to adapt as we better understand the impact on our services and operations.

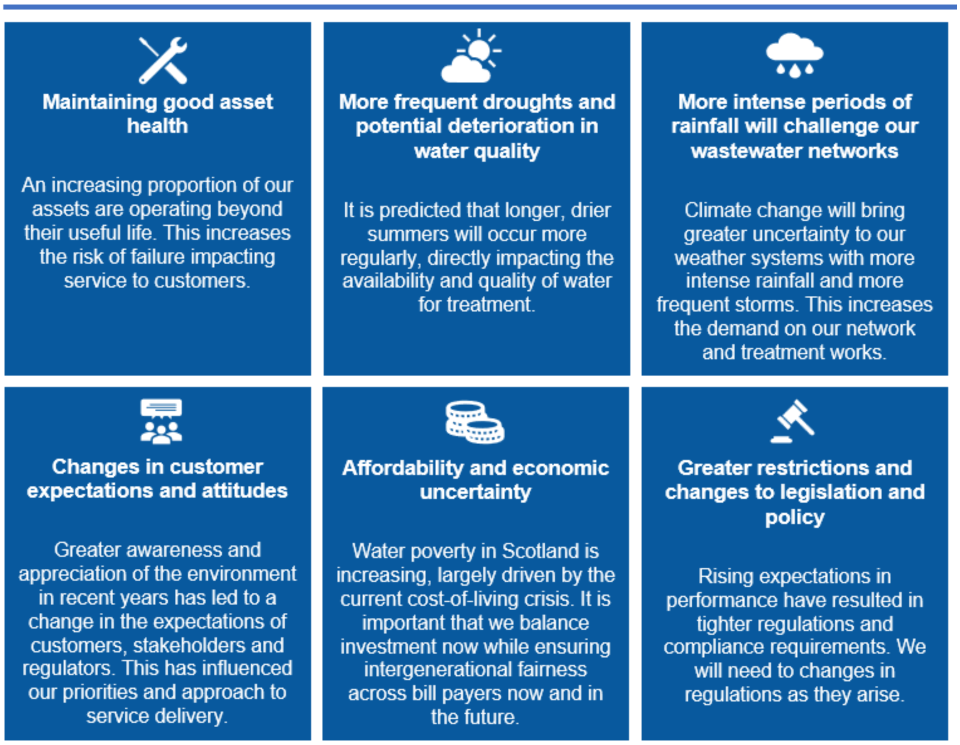
In addition to climate change we need to continue to develop our approach to **asset management**. The age of our asset base continues to grow, many of which are now over 100 years old, and represent an increasing risk to service. Over the previous decades our investment has shifted from installing new assets to repairing and refurbishing assets. As our asset management maturity develops, we will be able to progressively move towards maximising the value of our assets while delivering the service levels we have committed to.

Population change means that demand on our services is growing in some areas and diminishing in others. Socioeconomic changes are affecting the average household size, which impacts how we manage and provide access to our networks. **Water use patterns** are changing, as more people work from home, and we anticipate further changes as customers awareness of their usage patterns and associated environmental impacts grows.

Over the 25 years we will need to respond to **changes in expectations** from customers, stakeholders, government and regulators. This may be in response to emerging threats and new challenges or a **shift in public value** placed on specific issues. These challenges are hard to predict, however we have ensured that our strategy incorporates the constant monitoring of new threats and regulations which we may need to respond to. Our review cycle will enable us to make changes where customer priorities have changed

We will need to respond to changes in expectations from customers, stakeholders, government and regulators. This may be in response to emerging threats and new challenges. These challenges are harder to predict however we have ensured that our strategy incorporates constant monitoring of new chemicals or contaminants which we may need to respond to. This will ensure we are able to act promptly to protect customers or the environment. Cost challenges are also tough to predict, however, we will manage this through the strategic review process to mitigate economic shocks to customers.

Figure 7: Summary of challenges



1.3.3 Assumptions

The most material assumptions made across all sub outcomes are set out in Table 3 below. These assumptions have a direct impact on the level of investment required over the next 25 years. Changes to these assumptions are likely to have either a material impact on the ability of our strategy to achieve the objectives set out in our Long-Term Strategy or on the costs required. As a result it is important that these assumptions are monitored over the 25-year period and our strategy and cost estimates updated when they change

Table 3: Fundamental assumptions made in the development of our long-term investment strategy

Assumption	Details	Basis	What does it affect
Climate change	The climate proceeds to change at a rate to cause 2°C rise in temperatures by 2050 and 4°C rise by 2080.	These increases reflect the findings of our climate change risk assessment.	We anticipate an increase in extreme weather caused by climate change – including hotter, driver summers, periods of heavier rainfall and more intense storms. This will impact several service areas and may change the deterioration of our assets.
Customer base	We have assumed that regional population growth is in line with our current forecasts.	Unable to predict macro-scale changes which may impact migrations rates or births and death rates.	The demand on our water and wastewater systems are determined by the populations we serve. Populations growth will impact where we need to upgrade

Assumption	Details	Basis	What does it affect
	Assumed no change to our operating area and areas of responsibility.		treatment works and networks to serve future customers.
Input costs	Future economic changes occur within our current risk limits (operational costs, borrowing and charging).	Difficult to predict the impact of macro, global-scale events which could impact costs.	The impact of such changes could be specific, e.g. limited availability of specific chemicals, or blanket, e.g. high inflation caused by national or international events.
	Skills availability and supply chain capacity remain sufficient to meet the scale of future investment programmes.		Delivery of our strategy depends on the availability of the supply chain.
Regulatory and policy changes	We have assumed no change to our current regulatory system, government policy, or legislative requirements.	Regulation adapts to societal expectations at a rate that does not result in unfunded cost pressures or new undertakings. Response to emerging health or environmental threats may require more rapid response.	Areas where we have legal obligations to comply with quality and performance standards. E.g. water quality compliance.
Customer behaviour	We have assumed there is no significant change in customer water use behaviour and attitudes to the environment.	Customer perceptions can change quickly, influenced by current media and events. However, it is important that we develop our strategy based on current preferences rather than anticipating future changes which may or may not materialise.	Changes in preferences can influence the monetised benefits set out in our strategic cost-benefit assessments. Customer behaviour can have a more direct impact on the investment required to manage for example, the misuse of sewers, or facilitate changes in water use patterns.
	No move to charge domestic households through metering.		
Technology	Innovations continue to be adopted and drive efficiencies across the business.	[x]	[x]

It is important to acknowledge that if these assumptions change, we will need to review our long-term investment strategy, and the relevant areas impacted. This may mean that we can deliver more or less than originally planned, for example, if economic pressures lead to lower or higher costs. Or it may mean that we may need to reprioritise our delivery plan, for example, if regulatory limits were tightened for lead, we may need to revise our strategy to deliver a lead-free network more quickly. This is something we consider in our monitoring and review schedule.

1.4 Search

From our identified risks, challenges and issues we have developed, explored and evaluated strategic options. At a sub-outcome level our optioneering approach broadly follows HM Treasury's Greenbook[1] best practice on appraisal. We developed a long list of solutions for each area which incorporated tried and tested approach in addition to new, innovative methods and technologies. We considered the interdependencies of each solution on other sub-outcomes and service outcomes. This enabled us to identify those solutions which offered multiple benefits and those which may work in conflict with other outcomes.

1.5 Choose

From our long list, each solution was assessed against three criteria – technical feasibility, financial feasibility and the certainty of delivery. These criteria enabled us to balance the efficacy of solutions against the level of investment. Based on these criteria the long list was filtered down to identify our preferred options.

Where relevant, we then sought to identify those investments which contributed to the outcomes of multiple sub-outcomes and minimized any negative effects on other outcomes. As such, we consider our solutions to reflect the best value options, rather than the simply the lowest cost.

1.5.1 Costs

For each sub-outcome we developed a range of investment demand. We developed this range from the bottom up. We started by identifying the scale of challenge we would need to overcome to maintain our current performance and the required solutions we would need to implement. For each sub-outcome this estimation involved some assumptions and extrapolations, which are detailed in the sub-outcome appendices, for others it was appropriate to use a historic run rate of costs.

We then further considered the impacts of climate change on each sub-outcome. We used a range of approaches, including modelling and historic examples to forecast the adaptations we would need to make to maintain our current service levels with the anticipated climatic changes. These costs together formed the investment required to achieve position '0' on the SIT for all sub-outcomes and service outcomes.

The next level of investment was calculated by considering our legislative obligations and maintaining our internal policy positions over the next 25 years. To ensure that we can achieve full compliance with both policy and legislation we further identified any additional demand required, taking into consideration the current level of risk.

Finally, we calculated a 'maximum' investment demand, in which we considered the solutions and strategy required to resolve all known issues. This provided us with a maximum investment proposal (position 3 on the SIT), which theoretically would deliver performance as close to the water sector vision as is currently financially feasible.

[1] The Green Book, HM Treasury, May 2024.

Through building our investment demand in this way, we are able to see the key drivers behind delivering each service outcome (and sub-outcome). This provides us with valuable information in our decision-making process. For example, it may help us to identify where we may want to delay investment, in anticipation of more efficient approaches or technological advancement, and where we may want to bring investment forward to ensure we adequately mitigate future risks of non-compliance with legislation.

1.5.2 Link to near term demand

As projects mature during development, the scope and impact of climate change and the required adaptation measures will be assessed When considering a project investment appraisals, climate resilience is assessed as part of the Value Management process. Extract from Project Investment Appraisal guidance of key steps:

Undertake Analysis of the Business-as-Usual / 'As Is' Arrangements:

This analysis should focus on the current service model and level of service provision, considering how to maintain existing service levels and respond to forecast changes, including climate change impacts

Undertake Analysis of the 'To Be' Position:

The 'to be' position should include the impact of climate change over the lifetime of the asset, ensuring that future climate hazards are considered in the appraisal.

Determine the Case for Change:

The analysis should compare the 'as is' and 'to be' positions, identifying risks and opportunities, including those related to climate change. This helps in deciding when investments should be made to address these risks.

Generate the Critical Success Factors (CSFs):

CSFs should include considerations for climate resilience, ensuring that any intervention options are assessed against their ability to adapt to future climate conditions.

Benefits of Meeting the Need(s):

The benefits section should include how addressing climate hazards can sustain or enhance benefits, ensuring that climate resilience is factored into the appraisal

Links to Management Approaches:

The appraisal should capture how climate hazards could affect alignment with relevant Management Approaches.

1.5.3 Strategic Cost-Benefit Analysis (SCBA)

We have carried out cost-benefit analysis across all areas to identify where it may be cost-beneficial to deliver more. In some areas we are proposing a step-change in service levels and our policies. The investment strategy reflects our view of the best blend of progress across all strategic decision categories.

In the development of our sub-outcome and service outcome strategies we have considered tried and tested methods in addition to new tools and approaches. Solutions have been selected based on common criteria set out in the sub-outcome approaches appendices. We have also identified where we need to increase our knowledge and understanding of some areas in order to identify the most appropriate solution.

We have engaged with our board and consulted with our customers through the long-term strategy, to test that our overall ambition over the next 25 years is stretching and our priorities are the right ones. We have engaged with our regulators and other stakeholders on more specific service outcomes and sub-outcomes to ensure that our plans address the key risks in these areas and maximise existing opportunities.

1.5.4 Final demand over 2027 to 2051

Based on the analysis undertaken, the level of investment committed to for each sub-outcome was determined through internal discussion. Across all areas we made the decision to maintain our current service levels, including the necessary adaptations to climate change. This is in line with Scottish Government Ministerial objectives and customer expectations.

We further prioritized investment to make sure that we could meet our legislative obligations and where relevant, continue to adhere to our existing policies. The SCBA provided us with a view of where delivering more might be in customers interest and this informed our decision-making. Through internal discussion with senior stakeholders and our board, we were challenged to go further than our existing policies in some areas, for example, sewer flooding, and questioned existing policies where they were identified as not cost-beneficial.

1.6 Evolve

It is noted that as this is a 25yr projection and changes to the risks and opportunities, legislation, customer preferences etc, will mean that these outputs and associated investment will change over time. Future studies will help inform our understating of the demands, associated benefits and the solutions. We will monitor and adapt to changes as they emerge. A process has been established to maintain and update these projections on a regular bases to help inform future requirements.

1.7 Projections

1.7.1 Funding over SR27,33,39,45

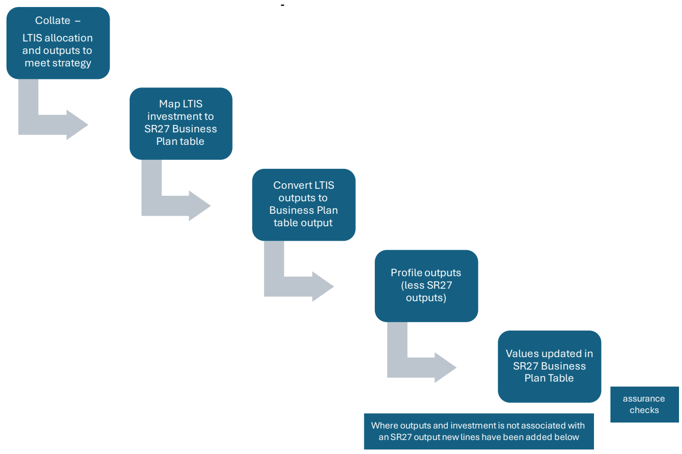
Table 5 shows the profile of funding per period has been used. This has been based on the output from the funding model. This has then allowed the profiling of the remaining outputs and investment across the remaining periods.

Table 4 - Updated (assumed) funding (post efficient)

£bn (23/24 price base)	SR 27	SR 33	SR 39	SR 45	Total
April 25 Funding (post Efficient)	8.31	11.0	13.8	17.3	50.4

A validation check was made with DBP Table 1 outcomes to ensure that there is general alignment between the outcomes and outputs. Figure 8 shows the high level process undertaken

A commentary is provided on why the future outputs have been profiled and show how this is assessed within the context of the overall £50bn projected investment and assumed funding profile for each period.



SW Internal
General

Figure 8 - Enhancement outputs process

1.7.2 LTIS Forecast Outputs (SRC33,39,45)

In this section we provide methodology on how the specific Long term outputs and linked to the DBP Table 2 output categories.

1.7.2.1Output profiling methodology **Output Columns 8,9,10,11,**

In developing the Long-Term Strategy (LTS), a more detailed Long Term Investment Strategy (LTIS) process, as described above, captured the total demand (as we understand at the time) required to achieve the outcomes stated in the LTS. Based on what is proposed in the SR27 draft submission the remaining demand has been profiled over SR33,39,45 in line with the assumed funding profile. This has ensured the overall £50bn investment and associated work is delivered within the 2027 – 2051 period. The output profile for any specific category has generated investment on each line using the total amount of outputs identified in the Long-Term Investment strategy (less those being delivered in SR27).

A methodology was developed to convert the LTIS outputs into the output units reflect the units in DBP Table 2. This has meant converting WTW sites into ML/d and WWTW in PE. In order that the total number of outputs and overall investment (2027-2051) remain the same a revised unit rate for each output as per DBP Table 2 has been derived. Figure 9 shows the high level data flow and sources of demand.

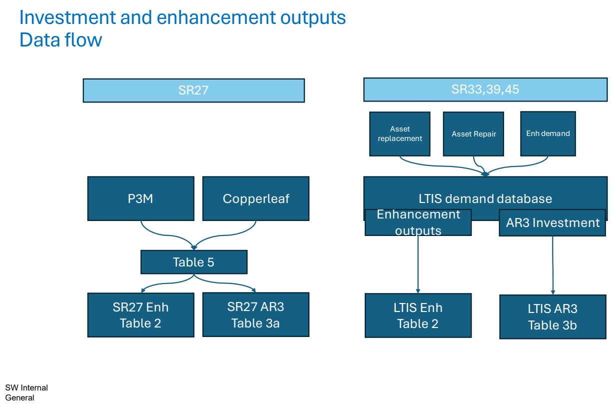


Figure 9 - Flow of data from systems into the Business Plan Tables

The overall methodology to fit the output into the funding profile was to prioritise (front end load) compliance outputs and then address risks to compliance in later periods. In addition, 4 methods where made to help profile the remaining outputs over the SRC33 to SRC45 periods:

- **Method 1:** where the SR27 outputs are higher than the original LTIS profile the LTIS value has been aligned with the SR27 number, and the residual outputs has been profiled reducing down from SR33 to SR45. This demand will be reviewed in September 25.
- **Method 2:** where the SR27 outputs are lower than the original LTIS profile the LTIS value has been aligned with the SR27 number, and the residual outputs has been profiled increasing from SR33 to SR45 with the assumption they will still all be delivered by SRC45.
- **Method 3:** where the SR27 outputs are approximately the same as the original LTIS profile the LTIS value has been aligned with the SR27 number and the original LTIS profile has been used for SR33 to SR45.
- **Method 4:** Where there is an assumed “run rate per period” the output profile has been split equally over the remaining 3 periods irrespective of the SR27 annual profile.

Once the outputs were profiled, the associated investment reflecting the outputs was assigned. Over 200 individual intervention scoping cost templates (including grouping interventions into different size bands) have been used to develop the overall LTIS enhancement investment. All the demand was associated with a sub outcome that relates to a Strategic category. We have mapped these Strategic Categories and Sub outcomes into DBP table 2 as shown in Table 5 below. It is noted that some DBP table 2 lines may contain a mixture or individual elements of a sub outcome.

Table 5: Mapping of Strategic Investment Categories and sub-outcomes to DBP Table 2 outputs

Line ref	LTIS strategic Investment Category	LTIS Sub Outcome	Output category	Unit
2.1	Sustainable Growth	Growth (Water)	Increase in Part 4 capacity at WTW	Ml/d
2.2	Sustainable Growth	Growth (Wastewater)	Increase in Part 4 capacity to meet wastewater growth requirements	Population equivalent
2.3	Sustainable Growth	Infra charge (Water)	Additional Part 3 capacity enabled from strategic water network reinforcement	Ml/d
2.4	Sustainable Growth	Infra charge (Wastewater)	Additional Part 3 capacity enabled from strategic wastewater network reinforcement	Population equivalent
2.5	Water Quality	Lead	Number of lead communication pipes replaced	Number
2.6	Water Quality	Lead	Capacity at WTW with new or optimised phosphate equipment	Ml/d
2.7	Water Quality	Microbiology	Capacity at WTW sites with new auto-shutdown risk control interventions	Ml/d
2.8	Water Quality	Microbiology and organics and DBPs	Capacity at WTW sites made compliant with standards	Ml/d
2.9	Water Quality	Organics & DBPs	Capacity at WTW sites with improved treatment process	Ml/d
2.10	Water Quality	Organics & DBPs	Number of raw water supplies with improved water quality	Number
2.11	Water Environment	Network discharges	Number of Event Duration Monitors (EDM) deployed*	Number
2.12	Water Environment	Network discharges	Number of unsatisfactory intermittent discharges (UID) improved or removed	Number
2.13	Water Environment	Regulatory abstraction	Number of sites with Water Framework Directive improvements	Number
2.14	AR3	Reservoirs	Number of sites with reservoir drawdown enhancements	Number
2.15	Water Environment	Resource recovery	Increase in renewable energy generated	GWh / Annum
2.16	Water Environment	Treatment discharges	Population equivalent of WWTW sites with environmental pollution risk reduced	Population equivalent
2.17	Net zero	Carbon capture	Area of carbon capture sites established or supported	Hectars
2.18	Net zero	Operational emissions	Number of sludge treatment centres achieving compliance with Industrial Emissions Directive	Number
2.19	Net zero	Operational emissions	Reduction in energy usage through improved energy efficiency	GWh / Annum
2.20	Water Continuity	Low Pressure	Number of properties where persistent low pressure is resolved	Number
2.21	Water Continuity	Resistance to threat	Number of properties with reduced risk of flooding from mains	Number of properties
2.22	Water Continuity	Resistance to threat	Number of properties with improved resilience of water supply	Number of properties
2.23	Wastewater Flows	Chronic issues on the waste network	Number of properties removed from internal flooding at risk register	Number

Line ref	LTIS strategic Investment Category	LTIS Sub Outcome	Output category	Unit
2.24	Wastewater Flows	Chronic issues on the waste network	Number of properties removed from external flooding at risk register	Number
2.25	Business Support	Customer & community experience	Number of sites enabled for community access	Number
2.26	Business Support	Customer & community experience	Number of new top-up-from-the-tap points	Number
2.27	Business Support	Metering	Number of properties with meter installations for first time registered non-domestic premises	Number
2.28	Business Support	Metering	Number of domestic smart meters installed	Number
2.29	Water Environment	Other (legacy sludge)	Population equivalent of WTW sites with legacy sludge issues resolved	Population equivalent
2.30	Sustainable Growth	Service relocation (water)	Length of service relocations - water mains	km
2.31	Sustainable Growth	Service relocation (Wastewater)	Length of service relocations - sewers	km
2.32	Water Environment	Treatment discharges	Number of wastewater treatment improvement studies	Number
2.33	Business Support	Net Zero	Number of climate change audits and studies	Number
2.34	Water Continuity	Water Availability	Increase or replacement of capacity of treated water storage for enhancement purposes or growth purposes	Ml/d
2.35	Water Continuity	Water Availability	Increase or replacement of capacity of raw water storage for enhancement purposes or growth purposes	Ml/d
2.36	Water Environment	Network discharges	Increase or replacement of wastewater storage volume for enhancement purposes or growth purposes	m3
2.37	Wastewater flows	Rain water management	Increase in storage capacity delivered through Blue-Green Infrastructure	m3
2.38	Water Continuity	Water Demand	Demand-side improvements delivering benefits (excluding benefits from metering and leakage reductions)*	Ml/d
2.39	Business Support	Biodiversity	Area subject to interventions to improve biodiversity*	Hectars
2.40	Water continuity	Water Demand	Meter upgrades - households*	Number
2.41	Business Support	Water Demand	Meter upgrades - non-households*	Number
2.42	AR3	Water distribution	Length of potable water mains renewed*	km
2.43	Water Continuity	Water Availability	Additional WAFU benefit from supply interconnectors*	Ml/d
2.44	Water Continuity	Water Availability	Length of new supply interconnectors*	km

Line ref	LTIS strategic Investment Category	LTIS Sub Outcome	Output category	Unit
2.45	Water Continuity	Water Availability	Length of new resilience interconnectors*	km
2.46	Water Environment	Treatment Discharges	Increase in total flow to full treatment*	l/s
2.47	Water Environment	Treatment Discharges	Number of flow monitors installed at WWTW*	Number
2.48	Water Environment	Treatment Discharges	Population equivalent of WWTW sites made compliant with standards - chemical removal*	Population equivalent
2.49	Water Environment	Treatment Discharges	Population equivalent of WWTW sites made compliant with standards - phosphorus*	Population equivalent
2.50	Water Environment	Treatment Discharges	Population equivalent of WWTW sites made compliant with standards - sanitary parameters*	Population equivalent
2.51	Water Environment	Treatment improvements	Population equivalent of WWTW sites made compliant with standards - other	Population equivalent
2.52	Water Environment	Network Discharges	Number of screens installed*	Number
2.53	Water Environment	Treatment Discharges	Number of studies completed*	Number
2.54	Water Continuity	Water Demand	Reduction in leakage*	Ml/d
2.55	Business Support	Customer & community experience	Number of properties connected to Scottish Water's network from private water supplies	Number
2.56	Water Quality	Lead	Number of lead communication pipes relined	Number
2.57	Net zero	Emissions	Reduction in emissions	tCO2e
2.58	x	Other	Other enhancement expenditure	
2.59	x	Other	Other growth expenditure	
2.60		**Total**		

There are several Outputs and investment not included in the DBP table 2 that are shown in table 6 below. It may be possible to map them into an existing line for the final submission.

Table 6: Details of outputs and investments not included in table 2

Line ref	Service outcome	sub outcome	Output area	Output category
New Line	Water continuity	Resilience to Identifiable Hazards	Resilience to Identifiable Hazards	SW Assets protected from flooding
New Line	Water continuity	Resilience to Identifiable Hazards	Resilience to Identifiable Hazards	WTW with improved Chemical Storage
New Line	Water continuity	Resilience to Identifiable Hazards	Interruption to Supply	Asset Protection
New Line	Water continuity	Interruption to Supply	Interruption to Supply	Network Ints

1.7.2.2 Link to DBP Table 1

A validation check was made with DBP table 1 outcomes to ensure that there was general alignment between the DBP Table 1 outcome profiles and outputs profile. A separate commentary table shows which sub outcome strategies support the relevant outcome table through delivery of the outputs.

1.7.3 LTIS Capital Expenditure

For this draft submission, all the expenditure is presented in 2023-24 price base, and is a forecast of SW's most likely outturn cost including risk allowances.

Investment is profiled to mirror the output profile and also ensure the investment within period is within the assumed funding profile.

1.7.4 LTIS primary assumptions

- The outcomes to be achieved are laid out in the Long Term Strategy. These may change over time in which case the underlying demand will be reassessed.
- All demand will be delivered in the 4 periods (SRc27,33,39,45)
- The average funding will in the order of 3.3% above CPI across the 24yrs giving ~£50bn of funding available (post efficient).
- Climate change will be 2deg to 2050
- Demand only includes compliance with current legislation so RWWTD and climate change policy requirements are excluded
- Within the rainwater management area there is an expectation of 50% funding from other organisations.
- The impact of PFAS (forever chemicals and chemicals of interest) is only just emerging and so demand in this area will improve as further studies and analysis is undertaken.
- Scopes and costs are based on known technology today so will be updated as new interventions are adopted.
- The strategic cost benefit analysis that supports the areas of investment will be developed and as more customer research is undertaken this may change the focus of the benefits that we aim to achieve.

1.7.5 LTIS Confidence grades

Not applicable

Table 3a: Maintenance Expenditure Commentary

Contents

1 Overview of Maintenance expenditure

1.1 Purpose

Business Plan Table 3a captures the asset maintenance work planned for SRC27. This expenditure on each asset category is categorised as either replacement or repair and refurbishment. The table includes information relating to the overall asset inventory of Scottish Water to capture the difference between economic depreciation and asset maintenance expenditure. This table provides information on:

- the expenditure of asset replacement and repair/refurbishment interventions forecast in each year of the SRC27 regulatory control period;
- the number of assets, their unit cost of replacement, capacity, asset value (MEAV) and expected asset lifetime; and,
- the asset replacement surplus or deficit generated in SRC27, i.e., the difference between the actual replacement expenditure and the average annual run-rate for replacement calculated based on the asset value divided by the median assumed asset life of that asset category.

All Investment is currently shown in 23/24 price base it will be updated to 24/25 for the Final Business Plan Submission.

2 Block A: Assets

The asset categories and subcategories do not fall directly into some of the Management Approaches, so an assumption has been made where some assets reside (subsea pipelines mapped to water mains, pipe bridges mapped to water mains ancillaries). Table 5 provides details regarding what projects or allocations are mapped to which Business Plan Table 3a line, in additional Column 138.

It is noted that Line 3a.11 and 3b.12 should have a functional activity of water treatment works.

For consistency between Business Plan Table 3a and 3b it would be helpful for Final Business Plan tables to standardise function name. Proposed naming is listed below:

- Source
- Water Treatment
- Water Network
- Customer side water (future requirement)
- Customer side wastewater (future requirement)
- Wastewater network
- Wastewater treatment
- Discharge
- Business Services
- For line 3a.11 and 3a.12 the functional activity is proposed to be amended from source (raw) to Water Treatment to reflect the same functional activity in Business Plan Table 3b lines 3b.5 & 3b.6.

3 Block B: Capital Expenditure (£m) (2023-24 Price Base)

For the draft Business Plan all investment values have been presented in 2023-24 prices, in £m to 3 decimal places.

3.1 Approach

Reference should be made to the document - “Business Plan Table 2 Appendix A – Developing the bottom-up SR27 Outputs and Investment”, which is equally applicable to Business Plan Table 3a in describing the approach to rolling investment portfolios, demand estimation and development of the investment baseline through Investment Scenario Planning activities.

For determination of the AR3 investment allocations that are detailed in Business Plan Table 3a, the main variance in approach from Table 2 was that the demand assessment and prioritisation approach was less project and output specific, with greater focus on overall Management Approach investment and levels required to maintain current levels of service.

Table X is an additional table not requested as part of the Business Plan submission. It provides a detailed breakdown of asset maintenance and enhancement / growth investment demand. It allocates investment against various Need codes, with each investment need code having a separate line. This means that a project may map investment to more than one need code and programme line in Business Plan Table 5. For example, if a project has multiple benefits, such as an environmental improvement project that also involves maintenance on existing assets, the expenditure is allocated based on the estimated cost for each activity to the relevant need code and hence management approach or Business Plan Table 2,3a line.

In determining the proposed investment allocations, the following additional control steps were undertaken for AR3:

- AR3 Investment needs were categorised against a specific sub-portfolio (Water, Wastewater, Support Services or Customer Experience & Flourishing Scotland), each with different sub-portfolio ownership responsibilities identified within Scottish Water.
- Sub-portfolio owners had a responsibility to prioritise the allocation of investment across their needs and management approaches, within the overall top-down allocations agreed through the wider governance process.
- Prioritisation across sub-portfolios took consideration of various parameters including bottom-up and modelled demand estimates, historic run-rate analysis, understanding of backlog volumes and emerging issues from SR21 e.g. increasing burst rates, statutory and legislative obligations and potential impact on and risks to levels of service.
- Overall AR3 review processes with sub-portfolio owners were led by Portfolio Management to ensure a consistency of approach and risk appetite across the various sub-portfolios.

3.2 Grouping asset maintenance projects and programmes

Investment demand in Copperleaf covers both project and programme investment lines.

For the Draft Business Plan all asset maintenance AR3 investment in Table 5 is shown as programme investment lines. These programme lines align to the asset maintenance Need lines to which we have allocated asset maintenance funding in SR27.

In Table X, investment is allocated against these Need codes. Each investment need code has a separate line so a project may map investment to more than one need code and programme line in table 5. For example, where a project/programme has multiple benefits (e.g. a SEPA driven environmental improvement project also involves maintenance on existing assets) this will be assigned a need code that relates to the environmental improvement output and a need code that relates to the maintenance output(s). Expenditure will be allocated based on the estimated cost for each activity to the relevant need code i.e. 1 project made up of 2 needs split 70% of costs to environmental improvement and 30% of costs to maintenance.

See *Table 1* below which is an extract from Business Plan Table X for the Dalderse WWTW - Growth project. It can be seen that the investment has been allocated against 4 different Investment Need lines with a % split allocation adding up to 100%.

Investment Need	**Investment Name**	**Need Description**	**Table 5 Grouping**	**P3M % allocated to need ID**
725	Dalderse WwTW - Growth	Maintain inlet works including inlet, screening, grit removal and storm tanks.	AR3-725 (Reference) Scenario A	20%
727	Dalderse WwTW - Growth	Maintain primary treatment including tanks, wet well, pumps, instrumentation, control & monitoring, buildings, screenings, cranes, sampling	AR3-727 (Reference) Scenario A	30%
729	Dalderse WwTW - Growth	Maintain secondary treatment including tanks, septic tanks, activated sludge assets, wet well, instrumentation, BAF filter, reed bed	AR3-729 (Reference) Scenario A	30%
811	Dalderse WwTW - Growth	Confirmed development in catchments which require investment	P5363112894-811 (Reference) Scenario A	20%

Table 1: Example Table X Extract - Dalderse WWTW

For this project 3 of the 4 lines are associated with AR3 Needs and for these lines Table 2 includes a further % split of this investment against Replacement and Repair & Refurbishment as shown below.

Investment Need Investment Name P3M % allocated to need Copperleaf (CL) Allocation of expenditure to maintenance: replacement (%) Allocation of expenditure to maintenance: repair & refurbishment (%) Allocation of expenditure to enhancement (%) Allocation of expenditure to growth (%).

Investment Need	**Investment Name**	**P3M % allocated to need CL**	**Allocation of expenditure to maintenance: replacement (%)**	**Allocation of expenditure to maintenance: repair & refurbishment (%)**	**Allocation of expenditure to enhancement (%)**	**Allocation of expenditure to growth (%)**
725	Dalderse WwTW - Growth	20%	79%	21%	0%	0%
727	Dalderse WwTW - Growth	30%	47%	53%	0%	0%
729	Dalderse WwTW - Growth	30%	61%	39%	0%	0%
811	Dalderse WwTW - Growth	20%	0%	0%	0%	100%

Table 2: Dalderse % split against AR3

The AR3 programme lines are then assigned a Business Plan Table 3a Line reference (Refer Additional Column 138 in Table 5) to correspond to a function, asset category and sub asset category.

To enable population of Business Plan Table 3a for some sub asset categories the need has had to also be split (i.e. between CIVIL and MEICA). An assumed split has been used (40:60) for the draft business plan. Where a need ID has a “C” it relates to a civil split and for “M” a MEICA split has been made. The Asset Management Approach has also been included to show the relationship to the Need ID and hence the Asset Category. The Asset Management Approach is important as this determines the inspection, and intervention policy.

At Business Plan stage there is limited bottom up SR27 project level costs available to break out unit costs by asset size. Instead, a combination of SR21 actual unit cost and revised unit costs used for MA policy estimates have been used to forecast replacement outputs associated with the AR3 investment lines.

More granular asset maintenance investment demand was used as part of our planning considerations. The detailed breakdown of our Need level investment is included within Table X and includes reference to planned and responsive investment demand.

3.3 Expenditure Allocation between Replacement & Repair/Refurb

The % split between Replacement & Repair/Refurb has been applied consistently at an AR3 Need level (rather than being project specific) based on intelligence provided from either historic SR21 cost splits or bottom up SR27 demand information, dependent on where there was higher confidence grading.

The overall % split assumption for the SR27 period has been assessed as follows:

- Replacement – 51% (£2,545.899m).
- Repair & Refurbishment – 49% (£2,415.325m).
- For SR27 the repair and refurbishment expenditure split has a further indicative split assumption, as follows.
- Repair – 39%.
- Refurbishment – 10%.

For each Need we also have developed a good understanding of the % split between our planned and responsive investment from our tracking of actual asset maintenance costs within SR21. (Since 2020, each intervention must be tagged with a relevant Need Reference (WIC Need Code) in P3M and flag if the work is being carried out responsively or planned, while there are limitations in that a single project can either be one or the other – not a mix, the information has allowed us to understand the level of work in each category).

3.4 Profiling of AR3 Investment

Capital investment profiling mirrors the steady growth of charges across the period and availability of funding. For our maintenance AR3 investment programme lines we have profiled investment for each Management Approach to match the available funding set by the customer charging/ billing profile.

3.5 Lead pipes

The capital expenditure associated with Water Mains: Communication pipes - lead line equals the costs reported in table 2 associated with output “Number of lead communication pipes replaced.” These costs are excluded from the asset replacement expenditure totals in Business Plan table 3a as per WICS guidance.

In Block B and Block E of Business Plan Table 3a, total expenditure on water assets excludes expenditure on lead communication pipes to avoid double counting with table 2, line 2.5. In Block C and D lead communication pipes are included in the calculations for total asset value of water assets, annual run-rate (£m) for replacement of all water assets, and the asset replacement surplus/deficit for all water assets.

3.6 Line by line commentary

Line reference 3a.1 - Raw Water Pumping-Civils

Total allocated expenditure of £1.914m This is split 23% to Repair and Refurbishment and 77% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Water Pumping Stations (MA058) at a cost of £1.913m

Line reference 3a.2 - Raw Water Pumping-MEICA

Total allocated expenditure of £2.87m. This is split 23% to Repair and Refurbishment and 77% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Water Pumping Stations (MA058) at a cost of £2.87m

Line reference 3a.3 - Raw Water Mains-Total

Total allocated expenditure of £4.719m. This is split 77% to Repair and Refurbishment and 23% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Strategic infrastructure (MA025) at a cost of £4.718m

Line reference 3a.4 - Infinite-Life Assets-Dams and impounding reservoirs

Total allocated expenditure of £294.853m. This is split 77% to Repair and Refurbishment and 23% to Replacement interventions (primarily work required to improve draw off requirements based on Supervising Engineers reports). Included within this category are the following Management Approaches and associated expenditure.

- Reservoir Safety (MA004) at a cost of £294.850m

Line reference 3a.5 – No Investment within this category

Line reference 3a.6 - Infinite-Life Assets-Raw water storage (civils)

Total allocated expenditure of £4.844m. This is split 48% to Repair and Refurbishment and 52% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Raw Water Storage (MA074) at a cost of £2.406m
- WT Capability Improvement (MA006) at a cost of £2.438m

Line reference 3a.7 - Infinite-Life Assets-Aqueducts

Total allocated expenditure of £97.110m. This is split 85% to Repair and Refurbishment and 15% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Strategic infrastructure (MA025) at a cost of £97.112m

Line reference 3a.8 - Infinite-Life Assets-Raw water intakes (gravity)

Total allocated expenditure of £11.178m. This is split 41% to Repair and Refurbishment and 59% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Strategic infrastructure (MA025) at a cost of £11.179m

Line reference 3a.9 - Ground Water Sources (Pumped)-Civils

Total allocated expenditure of £5.294m. This is split 38% to Repair and Refurbishment and 62% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Water Enviro Monitor & Comply (MA063) at a cost of £1.228m
- Boreholes (MA080) at a cost of £4.066m

Line reference 3a.10 - Ground Water Sources (Pumped)-MEICA

Total allocated expenditure of £6.098m. This is split 34% to Repair and Refurbishment and 66% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Boreholes (MA080) at a cost of £6.101m

Line reference 3a.11 - Water Treatment Works -Civils

Total allocated expenditure of £157.646m. This is split 74% to Repair and Refurbishment and 26% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Filtration (MA033) at a cost of £70.987m
- Network Chemical Dosing (MA106) at a cost of £2.119m
- Offices, Property and Estates (MA029) at a cost of £5.954m
- Water & Wastewater - Property and Access (MA096) at a cost of £48.858m
- WTW Process Stage Civils (MA093) at a cost of £27.995m
- Access to Equipment (MA105) at a cost of £1.735m

Line reference 3a.12 - Water Treatment Works -MEICA

Total allocated expenditure of £614.289m. This is split 30% to Repair and Refurbishment and 70% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Network Chemical Dosing (MA106) at a cost of £3.178m.
- Filtration (MA033) at a cost of £0.621m.
- SCADA, PLC & HMI (MA022) at a cost of £163.222m.
- WTW Chemical Storage & Dosing (MA046) at a cost of £0.775m.
- WTW Sludge & Washwater Handling (MA052) at a cost of £30.027m.
- Statutory & Planned Maintenance (MA068) at a cost of £34.881m.
- MCC - W (MA082) at a cost of £26.818m.
- Sample Points (MA081) at a cost of £12.286m.
- Security (MA089) at a cost of £7.372m.
- Standby Power (MA092) at a cost of £11.334m.
- Telemetry (MA044) at a cost of £14.176m.
- WTW Chemical Storage & Dosing (MA046) at a cost of £174.583m.
- WTW Process Stages M&E (MA094) at a cost of £97.058m.
- WTW Water Quality Instrumentation (MA095) at a cost of £24.22m.
- HV (MA091) at a cost of £13.725m.

- WTW Process Stages M&E (MA094) at a cost of £0.008m.

Line reference 3a.13 - Treated Water Pumping-Civils

Total allocated expenditure of £11.145m. This is split 40% to Repair and Refurbishment and 60% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Water Pumping Stations (MA058) at a cost of £11.145m

Line reference 3a.14 - Treated Water Pumping-MEICA

Total allocated expenditure of £37.665m. This is split 36% to Repair and Refurbishment and 64% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Water Pumping Stations (MA058) at a cost of £16.717m
- HV (MA091) at a cost of £20.948m

Line reference 3a.15 – No Investment within this category

Line reference 3a.16 - Treated Water Storage-Service reservoirs

Total allocated expenditure of £391.191m. This is split 82% to Repair and Refurbishment and 18% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Treated water storage (MA037) at a cost of £391.191m

Line reference 3a.17 – No Investment within this category

Line reference 3a.18 - Water Mains-Water trunk mains >300mm

Total allocated expenditure of £48.988m. This is split 77% to Repair and Refurbishment and 23% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Strategic infrastructure (MA025) at a cost of £48.988m

Line reference 3a.19 – No Investment within this category

Line reference 3a.20 - Water Mains-Water distribution mains <=300mm

Total allocated expenditure of £277.965m. This is split 9% to Repair and Refurbishment and 91% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Recurring Customer Interruption (MA001) at a cost of £231.018m
- Distribution Infrastructure - Interruptions to Supply (MA015) at a cost of £9.494m
- Network valves (MA060) at a cost of £12.642m
- Distribution Infrastructure – Discolouration (MA016) at a cost of £24.814m

Line reference 3a.21 – No Investment within this category

Line reference 3a.22 - Water Mains-Water distribution mains asbestos cement

Total allocated expenditure of £541.055m. This is split 44% to Repair and Refurbishment and 56% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Distribution Infrastructure - Interruptions to Supply (MA015) at a cost of £541.055m

Line reference 3a.23 – No Investment within this category

Line reference 3a.24 - Water Mains-Communication pipes - lead

Total allocated expenditure of £33.963m. This is split 0% to Repair and Refurbishment and 100% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Lead Management (MA041) at a cost of £33.963m

Line reference 3a.25 – No Investment within this category

Line reference 3a.26 - Water Mains-Ancillaries

Total allocated expenditure of £155.128m. This is split 72% to Repair and Refurbishment and 28% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Metering & Flow Monitoring (MA073) at a cost of £54.355m
- Ironworks (MA018) at a cost of £34.855m
- Strategic infrastructure (MA025) at a cost of £2.211m
- Water Demand Management (MA099) at a cost of £0.982m

Line reference 3a.27 – No Investment within this category

Line reference 3a.28 - Water Meters-Industrial customer water meters

Total allocated expenditure of £13.392m. This is split 0% to Repair and Refurbishment and 100% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Customer Meters (MA034) at a cost of £13.392m

Line reference 3a.29 through to 3a.30 No Investment within these categories

Line reference 3a.31 – Water subtotal

Line reference 3a.32 - Pumped Combined Rising Mains-Total

Total allocated expenditure of £140.581m. This is split 38% to Repair and Refurbishment and 62% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Pumping mains (MA012) at a cost of £140.58m

Line reference 3a.33 through to 3a.34 No Investment within these categories

Line reference 3a.35 - Combined Sewer Overflow-Screened

Total allocated expenditure of £11.722m. This is split 53% to Repair and Refurbishment and 47% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- CSO (MA039) at a cost of £11.723m

Line reference 3a.36 – No Investment within this category

Line reference 3a.37 - Sewage Pumping Stations (Combined)-Civils

Total allocated expenditure of £56.023m. This is split 46% to Repair and Refurbishment and 54% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Sewage Pumping Stations (MA023) at a cost of £56.023m

Line reference 3a.38 - Sewage Pumping Stations (Combined)-MEICA

Total allocated expenditure of £179.863m. This is split 50% to Repair and Refurbishment and 50% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Sewage Pumping Stations (MA023) at a cost of £84.035m
- MCC (MA011) at a cost of £27.594m
- Screw Pumps - WW (MA036) at a cost of £18.211m
- Statutory & Planned Maintenance (MA068) at a cost of £28.257m
- HV (MA091) at a cost of £21.765m

Line reference 3a.39 - Other Sewage Structures (Combined)-Total

Total allocated expenditure of £129.459m. This is split 88% to Repair and Refurbishment and 12% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Maintain Pipebridges (MA003) at a cost of £87.681m
- Sewer Structures (MA062) at a cost of £16.752m
- Ironworks (MA018) at a cost of £25.026m

Line reference 3a.40 - Other Sewage Structures (Combined)-Total

Line reference 3a.41 - Infinite-Life Assets (Combined)-Other

Total allocated expenditure of £248.967m. This is split 83% to Repair and Refurbishment and 17% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Non Critical Sewers (MA014) at a cost of £199.703m

- Critical Sewers (MA002) at a cost of £49.265m

Line reference 3a.42 - Wastewater Treatment Works (Combined)-Civils

Total allocated expenditure of £417.958m. This is split 51% to Repair and Refurbishment and 49% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- WwTW Inlet Works (MA017) at a cost of £43.738m
- WwTW Primary Treatment (MA042) at a cost of £29.486m
- WwTW Secondary Treatment (MA043) at a cost of £63.664m
- WwTW Ancillaries (MA057) at a cost of £90.662m
- Water & Wastewater - Property and Access (MA096) at a cost of £0.051m
- Offices, Property and Estates (MA029) at a cost of £5.859m
- Chlorine Contact Tanks (MA100) at a cost of £24.572m
- Water & Wastewater - Property and Access (MA096) at a cost of £33.175m
- WwTW Ancillaries (MA057) at a cost of £3.913m
- Access to Equipment (MA105) at a cost of £9.116m
- PFI (Private Finance Initiative) (MA108) at a cost of £113.722m

Line reference 3a.43 - Wastewater Treatment Works (Combined)-MEICA

Total allocated expenditure of £618.118m. This is split 33% to Repair and Refurbishment and 67% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- WwTW Primary Treatment (MA042) at a cost of £44.229m
- WwTW Secondary Treatment (MA043) at a cost of £95.495m
- WwTW Odour Equipment (MA049) at a cost of £7.311m
- Temporary Process Units (MA021) at a cost of £23.436m
- Enabling Development- Wastewater (MA026) at a cost of £5.069m
- Screw Pumps - WW (MA036) at a cost of £7.117m
- MCC (MA011) at a cost of £48.067m
- SCADA (MA013) at a cost of £49.143m
- Telemetry (MA044) at a cost of £24.571m
- HV (MA091) at a cost of £43.222m
- Statutory & Planned Maintenance (MA068) at a cost of £31.659m
- WwTW Ancillaries (MA057) at a cost of £2.608m
- PFI (Private Finance Initiative) (MA108) at a cost of £170.584m

Line reference 3a.44 through to 3a.45 No Investment within these categories

Line reference 3a.46 - Sludge Treatment Centres (Combined)-Civils

Total allocated expenditure of £64.009m. This is split 35% to Repair and Refurbishment and 65% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Sludge Treatment Centres (MA024) at a cost of £64.009m

Line reference 3a.47 - Sludge Treatment Centres (Combined)-MEICA

Total allocated expenditure of £42.672m. This is split 35% to Repair and Refurbishment and 65% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Sludge Treatment Centres (MA024) at a cost of £42.672m

Line reference 3a.48 - Outfalls From Treatment (Combined)-Total

Total allocated expenditure of £25.047m. This is split 43% to Repair and Refurbishment and 57% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Outfalls - WW (MA035) at a cost of £25.048m

Line reference 3a.49 – Foul Sewage & Surface Water Shared Assets subtotal

Line reference 3a.50 through to 3a.68 - No Investment within these categories

Line reference 3a.69 - Surface Water Storage and Treatment (Nature-based)-SUDS

Total allocated expenditure of £0.553m. This is split 100% to Repair and Refurbishment and 0% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Sewer Structures (MA062) at a cost of £0.552m

Line reference 3a.70 through to 3a.77 - No Investment within these categories

Line reference 3a.77 – Surface Water Only subtotal

Line reference 3a.78 - Support Services-Vehicles

Total allocated expenditure of £126.712m. This is split 0% to Repair and Refurbishment and 100% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Logistics (Vehicles) (MA071) at a cost of £126.713m

Line reference 3a.79 - Support Services-Digital

Total allocated expenditure of £103.597m. This is split 16% to Repair and Refurbishment and 84% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Digital Policy (MA066) at a cost of £103.598m

Line reference 3a.80 - Support Services-Facilities and estates

Total allocated expenditure of £52.843m. This is split 59% to Repair and Refurbishment and 41% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Water & Wastewater - Property and Access (MA096) at a cost of £29.323m
- Offices, Property and Estates (MA029) at a cost of £23.521m

Line reference 3a.81 - Support Services-Renewable energy

Total allocated expenditure of £22.854m. This is split 0% to Repair and Refurbishment and 100% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Renewable Energy (MA056) at a cost of £22.854m

Line reference 3a.82 - Support Services-Scientific services

Total allocated expenditure of £8.600m. This is split 0% to Repair and Refurbishment and 100% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Scientific Instrument Replacement (MA053) at a cost of £8.601m

Line reference 3a.83 - Support Services-Other

Total allocated expenditure of £34.303m. This is split 92% to Repair and Refurbishment and 8% to Replacement interventions. Included within this category are the following Management Approaches and associated expenditure.

- Emergency Response (MA098) at a cost of £2.358m
- Network Model Maintenance (MA054) at a cost of £31.942m

Line reference 3a.84 – Water & Wastewater shared assets subtotal

4 Block C: Asset Inventory

The MEAV and asset stock data is generated from the Annual Return H table (AR24) dataset. Costs and volumes in the G Table (AR24) are based on the number of unit level records that are operational and where a MEAV valuation is calculated – i.e., a cost model can be allocated. The costs and volumes are aligned to the sites that are reported in Table H.

The cost base for Table G is adjusted to the CPI index for 2017/2018, whereas the valuation in Table H is reported in the CPI index for the Annual Return period (AR24).

The Asset stock and MEAV is not currently disaggregated out into all the Business Plan Table 3a asset sub categories hence some lines have a blank field (as per table G).

- Line 3a.5 dam ancillaries is included within Line 3a,4 Dams and impounding reservoirs
- Line 3a.6 is In line 3a.16 Service reservoir
- Line 3a.23 – supply pipes are not included in MEAV
- Line 3a.24 communication pipes Lead are included in Line 3a.25
- Line 3a.26 water ancillaries is not called out and is considered part of Line 3a.17 – 3a.22 water mains
- Line 3a.27 domestic meters is not included in MEAV due to the low volume
- Line 3a.28 non domestic meters s not currently called out in the MEAV
- Line 3a.30 water meters ancillaries is included in Line 3a.29 network water meters
- Line 3a.34 sewer laterals are included in Line 3a.33 sewers
- Line 3a.35 & 3a,36 CSo screens / unscreened are not split out in table G and are included in Line 3a.33 sewers
- Line 3a.39 other sewer structures
- Line 3a.40 VC sewers included in line 3a.33
- Line 3a.41 infinite life (other) included in Line 3a.33 where applicable
- Line 3a.51 Emergency outfalls not currently identified separately in MEAV so included in Line 3a.33
- Line 3a.54 – 3a.61 foul only assets, these are not identified separately and are included in the foul sewage and surface water asset lines (lines 3a,32 – 3a.48).
- Line 3a.64 Emergency outfalls not currently identified separately in MEAV so included in Line 3a.33
- Line 3a.67 – 3a.76 surface water only assets, these are not identified separately and are included in the foul sewage and surface water asset (lines 3a,32 – 3a.48)

4.1 Column 15 – Number of Assets

The number of assets is calculated at unit level (not equipment level as in Business Plan Table 3b or at site level in the Annual Return Table G) and the total number of units is based on how the MEAV is calculated. This is currently based on AR24 asset register.

- MEICA Assets: Volumes – this is calculated as the total number of units where the gross MEICA valuation is greater than zero – i.e., the cost model for that unit includes a split of costs associated with MEICA assets

- CIVIL Assets: Volumes – this is calculated as the total number of units where the gross CIVIL valuation is greater than zero – i.e., the cost model for that unit includes a split of costs associated with CIVIL assets
- Where an Asset Category contains Civil and MEICA sub assets the summed total for asset stock has not been included as this could cause confusion when comparing with other tables such as where the asset stock total is for the site and not the sub assets within a site. Whereas the value is consistent given the value is calculated as sub asset level and summed to calculate the site valuation.
- The annual return G table separates out sewers under three different categories: Surface water, Foul only and Foul sewage & surface water shared (Combined). Surface water and foul were entered in their categories. The same methodology has been used to complete Business plan Table 3a (Column 15). Combined, laterals and remaining minor types e.g., Trade effluent and Treated effluent were entered into Foul sewage & surface water shared as this was the closest category. This enabled complete inclusion of sewers so totals to the same length as H4.1 and E7.8.

4.2 Column 16 – Units

The units associated with each Asset stock is used to differentiate how the stock has been measured (Number of units or KM of water / wastewater infrastructure pipe).

4.3 Column 17 – Unit cost of replacement (£m; 2024-25 price base)

This is a calculation field looking at the total MEAV (Column 20 divided by the number of units in Column 15). It is a very crude assessment of the average unit rate for each unit. The asset replacement model projections and the bottom-up project costs use specific unit rates for the asset being repaired or replaced.

4.4 Column 18 – Asset Capacity

“NA” has been entered in agreement with WICS. This has not been provided as it is not held adequality at unit level in corporate systems and the unit capacities in the asset categories are in different units of measure (kW, L/s, area, volume, etc) and so cannot be summed or amalgamated.

Overall, our existing 226 Water treatment works supply 1,816ML per day (on average) for 5.52m customers. Our 1841 Wastewater Treatments works currently treat 1.7ML of wastewater for 5.03m customers, and deal with 209ttds of bioresource by product (including PFI sites).

We have 2.829m properties connected for water and 2.692m properties connected for foul sewage and 2.698m properties connected for surface water drainage. All numbers include domestic and no domestic (Ref Table A1 (AR24) submission)

4.5 Column 19 – Units (Ml/d or m^3 for water assets and population equivalent or m^3 for wastewater assets)

“NA” has been entered in agreed with WICS. Comment as per Column 18 and not provided.

4.6 Column 20 – Asset value MEAV (£m) (2024-25 price base)

The costing methodology is as per the Annual Return Table H. Recent improvements to the costing methodology (improved unit costs and us of surface type) that was included in last year (AR24) have been included. MEAV Value held at 23/24 price base for Draft. This is calculated as the total gross valuation, excluding land value, for the assets for a particular category (Civil, MEICA, Water infra etc) based on AR24. Due to a conversion factor discrepancy, the total MEAV in Business Plan Table 3a is different from AR24 table G. This will be addressed for the final submission.

- MEICA Costs – this is calculated as the total gross MEICA valuation for the assets for a particular category. Note, the gross MEICA valuation excluded the estimate of land value (3.5%) that is included in the Table H MEAV as it was deemed to not be applicable for the valuation of interventions.
- . CIVIL Costs – this is calculated as the total gross CIVIL valuation for the assets for a particular category. Note, the gross CIVIL valuation excluded the estimate of land value (3.5%) that is included in the Table H MEAV as it was deemed to not be applicable for the valuation of interventions.

The MEAV in Table 3a totals £108.7bn. work is ongoing to align the table H remaining MEAV with Business Plan Table 3a and update for Annual Return 2025. This will be completed for the final submission.

4.7 Column 21 – Confidence grade

A confidence grade is assigned to each MEAV value as per the annual return (AR24). The field is left blank where there is no MEAV value

4.8 Column 22 – Assumed asset life (years)

The asset live values provided in Business Plan Table 3a are based on rolled up average asset based on the average life in asset type that was used to calculate the economic long term average asset replacement rate in 2019 (refreshed 2023). It is a crude assessment of summarising the life of each asset category. Table 3 below shows the range that are used in the asset replacement models or elicited from expert judgement depending on the asset type for the SR27 investment.

Asset category	**Average life Business Plan Table 3a (column 22)**	**Range See Table 3b appendix on asset lives**
MEICA	20	10 – 80yrs
CIVIL	80	50 - 150
Water meters	10	10 – 15yrs

Asset category	Average life Business Plan Table 3a (column 22)	Range See Table 3b appendix on asset lives
Water Infra	105 - 115	105 – 115yrs Primarily distribution mains. Trunk mains need to be separated out.
Water mains (AC)	90	60 – 90yrs
Raw water mains	115	See example on raw water mains pre 1940 we expect 200yrs but post 1940 less
Sewer rising mains	38	30 – 40yrs Experience is showing due to the harsh working environment the material is not lasting as long as expected.
Gravity sewer (vitrified clay)		*100- 300yrs*

Table 3: Summary of the asset lives provided in Business Plan Table 3a based on the economic long-term analysis

Asset lives used in the modelling for asset replacement that have generated the SR27 and long-term investment demand are determined primarily through analytical deterioration models. Where models are unavailable, expert judgement has been used instead. These models have been calibrated to the current performance of the asset base to allow forecasting of asset repair, refurbish, replacement demand. As there are multiple types of assets under a CIVIL, or MEICA line we have applied an average the asset lives across the asset categories. For asset categories that do not have a deterioration model developed, the lives have been based on subject matter expert elicitation.

If the MEICA asset base is broken down as in Table 4 below you can see the spread of asset lives that are used in Long Term asset replacement (Level 1) model projections.

MEICA category	Number of assets	Mean life	Annual Return 24 MEAV (23/24)
long	20358	35	1.4bn
medium	42562	25	2.5bn
short	52215	15	£2.2bn
Weighted mean life	115135	22	

Table 4: Summary of asset lives used in the long-term asset replacement model (level 1)

In the 2019 assessment MEIC lives were used as a range 15 -25 years.

More granular average expected lives and unit costs are used to calculate the asset replacement frequency and EHI with in each Management approach. (Business Plan Table 3b commentary Appendix A provides the more detailed lives used.)

4.9 Column 23 – Confidence Grade

Confidence grades for Assumed Asset lives (Column 22) are provided and match the Annual Return 24 information. The field is left blank where there is no asset life value.

4.10 Column 24 - Annual run-rate (£m) for replacement

This is the MEAV valuation divided by the expected lifetime for the asset category. No commentary has been provided for this data.

4.11 Accuracy & reliability

Confidence grades for MEAV (Colum 20) are provided and match the Annual Return 24 information. The Assumed Asset lives (Column 22) were the lives used in the original 2019 economic analysis of the sustainable replacement rate. This is a crude assessment given the variety of ages assets can extend to and does not account the age profile of the asset base. The field is left blank where there is no asset stock as per Annual Return Table G methodology.

5 Block D: Asset Replacement Surplus/Deficit in SRC27 (£m) (2023-24 Price Base)

For draft Business Plan the figures are presented in 2023-24 prices.

5.1 Column 25 - Cumulative surplus/deficit (£m) in SRC27

This assesses the Investment proposed in SR27 for asset replacement against the 6-year annual average unit asset replacement run rate. It does not take account of asset condition, variance in asset life between different assets, the asset age profile or material or differences in any improvement in asset remaining life as a result of repairs or condition at this stage.

This calculation utilises a fixed assumed life and does not take into account the age profile of the assets or their condition.

The specific Asset Management approaches lay out the interventions and economic benefits of each asset group.

Appendix A of Business Plan Table 3b commentary provides a more detailed view of asset lives.

For the final submission an analysis of 25 years could be provided if requested as this provides a more holistic view of whether there is sufficient investment in each category.

Note that “position 2” of the Long Term Investment Strategy (LTIS) is explained in Business Plan Table 3b commentary (section 1). It relates to the assumptions of extending asset lives made in the long-term asset replacement of CIVIL, MEICA and Water Infra assets.

5.1.1 Example analysis undertaken under the Asset Management process

Line 3a.8 MA116 Strategic Water Infrastructure - Raw water mains

Extract of analysis of replacement for Raw Water Mains from the Strategic Water Infrastructure Management Approach MA116. The purpose of this extract is to show that a straight replacement based on age or total length / expected average age is not a correct assessment of replacement rates. Work has been done in each Asset Management approach document to assess the life and repair / replacement requirements. Future work to integrate this into our analytical models will be a key focus over the next 2 years to build a more integrated picture across the asset base.

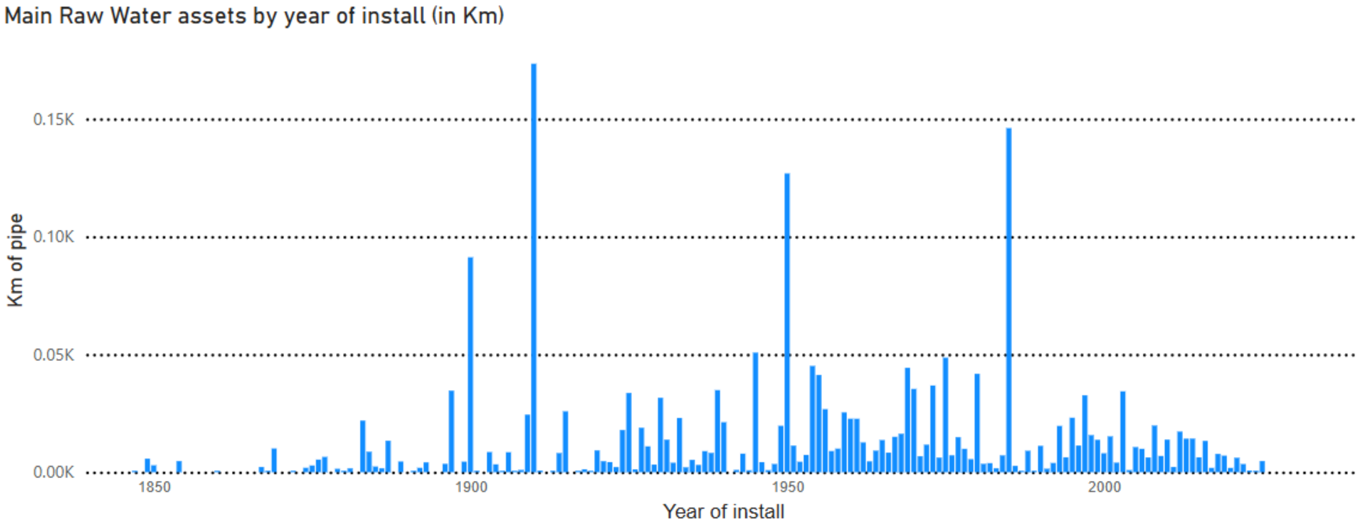


Figure 1: Raw water mains age profile

Pipe Material	Length (km)
Alkathene	0
Asbestos Cement	79
Cast Iron	368
Concrete	10
Ductile Iron	253
Ductile Iron Lined	11
Fire Clay	72
HEP30	13
High Density Polyethylene	18
High Performance Polyethylene	152
Lead	1
Medium Density Polyethylene	28
Other	4
Polyethylene	1
Polyvinyl Chloride	94
Pre-Stressed Concrete	50
Reinforced Concrete	8
Spun Iron	62

Table 5: Length of raw water pipe by material

Table 5 shows nearly half of our asset base of raw water mains is made of iron/ductile iron with a smaller proportion of PVC, asbestos cement (AC) and polyethylene (PE) pipes that are mostly used for small diameter pipes. A third of our asset base is classed as other material which includes fire clay, brick pipes. 42km (3%) of raw water mains remains of unknown material. The majority of our raw water mains first were laid post-1940 (65%) and 25% were first laid before 1940.

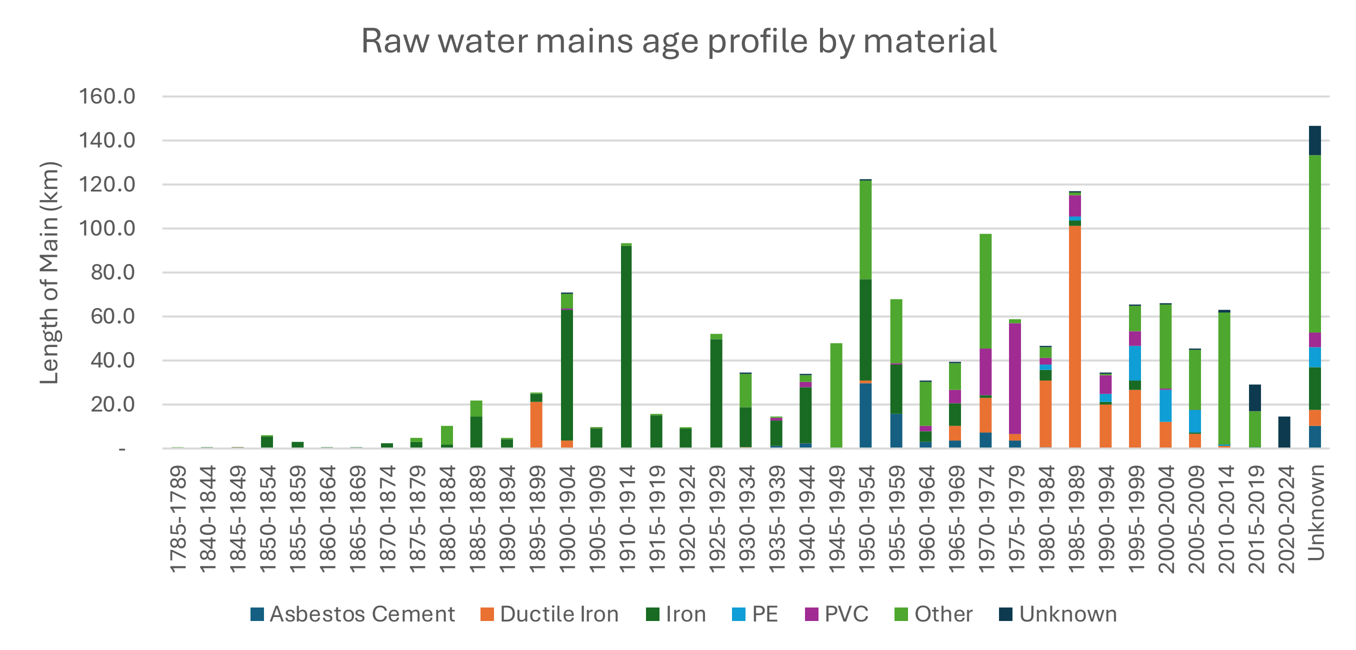


Figure 2: Spread of different material types that would impact the overall asset replacement requirement.

The life expectancy of raw water mains varies depending on operating conditions (temperature), pipe material, external pipe loading (traffic loading, high water table, etc.), the surrounding environment (e.g. soil moisture, corrosivity, chemical loading and soil contamination), and whether the pipes are protected (e.g. coating, lining, cathodic protection for steel pipes).

We have good records of age for our raw water mains assets that we use to estimate remaining service life based on standard values of expected service life for different pipe materials. We use this as a standard approach in our current asset degradation model used for developing the Management approach V2 demand. However, we know that some of our very old assets (100+ years old) are still in good condition and show limited signs of deterioration. For the development of this MA, we assume that most of our raw water mains assets have a 100-years asset life, with the exception of:

- Mains constructed pre-1940 have a longer asset life of 200-years. This was added to represent more accurately the condition of our older assets (acknowledging that many have lasted longer than the 100 year default asset life) and in order to provide better estimate of the spend profile when appraising different policy options. This assumption will be revisited through increased asset inspections to evaluate the remaining service life of those older assets and refine investment requirements.
- Ductile iron mains built between 1940 and 1990 have a shorter asset life assumed to be 50-years.

Information presented in Table 6 suggests that around 96% of our raw water mains assets is in good condition (grade 1 and grade 2) while less than 2% is currently experiencing some level of failure (grade 5). Out of 404km of raw water mains laid out before 1940, it is estimated that most (>98%) is still in good condition (7).

Likelihood of failure score	Description	Km of raw water mains, 2024	Percentage of total raw water mains, 2024	Km of raw water mains pre 1940
1	Remaining service life > 30 years	1,097	73%	398
2	Remaining service life between 10 and 30 years	342	23%	7
3	Remaining service life between 5 and 10 years.	32	2%	
4	Remaining service life < 5years	3	-	
5	Failed (assumes that remaining service life is equal or below)	25	2%	
Total		**1,498***		**404**

Table 6: Condition grades applied to raw water mains assets – current position

*validation of the total length to align with Business Plan Table 3b line 3a.3 will be included in the final submission.

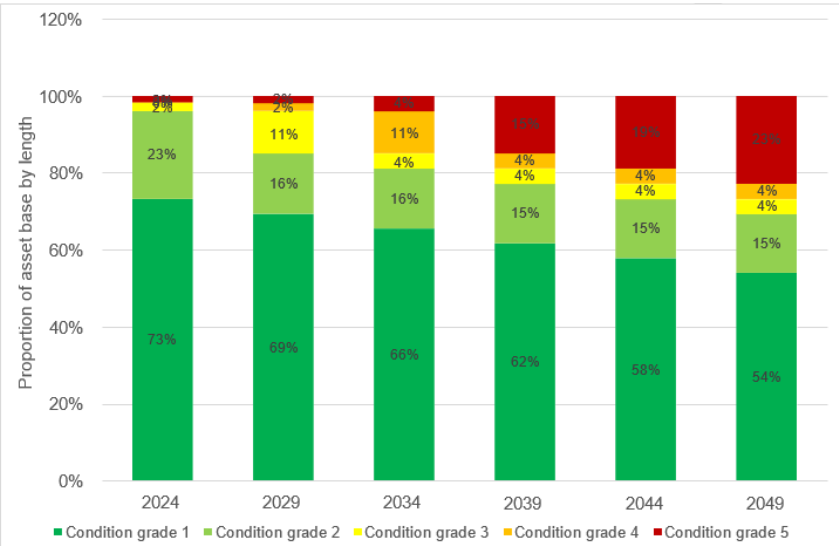


Figure 3: Percentage of raw water mains assets in each condition grade over time

Based on these forecasts Figure 3 shows 27% of our raw water mains assets (post 1940) are expected to have failed by 2049. Assuming that raw water mains built before 1940 have a 200-year asset life, 73% of our raw water mains assets that were built in that period are expected to remain in good condition by mid-century.

We are working towards refining our approach to assessing asset condition and degradation over time by enhancing our asset inspection programmes. The intention is to proactively survey one-eighth of the asset base on a 10-yearly frequency once the asset has reached the mid-point of its estimated service life (assumed to be 50 years for post-1990 assets). This frequency increases to 5-yearly when assets reach condition grade 4 to inform the timing of planned intervention

As we build up more condition survey data on our raw water mains, including re-surveying of assets and deploying new inspection methods over the coming years, we will be able to better understand the relationship between age and deterioration of the raw water mains and improve our asset degradation models. The Investment Planning Technical Appendix Annex A outlines the improvements proposed.

The preferred policy option for raw water mains involves a proactive approach to ensure continuous supply and minimize risks. The policy includes:

1. **Planned Refurbishment and Replacement**: One cycle of planned refurbishment followed by one cycle of planned replacement at condition grade 4, before assets deteriorate to condition grade 5. (refurbishment may include relining, cathodic protection, cleaning etc)

The policy aims to maintain service levels, avoid breaches of corporate risk appetite, and deliver optimum benefits at the least possible cost.

Further analysis on this asset category and information is available in the MA116 Strategic Water Infrastructure - Raw water mains

5.2 Commentary on Block D Asset replacement Surplus / Deficit

Column 25 Cumulative surplus/deficit (£m) in SRC27 is assessing the SR27 asset replacement investment against the whole asset stock in that asset category. **It does not take account of the asset age profile, the asset condition or the impact of repairs on the expected life that may be achieved.** The calculation uses an average assumed life that covers all assets in that asset category and the MEAV value for that asset category.

The data in each section show that if the analysis is looked at over a 6-year period whether there is sufficient asset replacement being undertaken. From the Long-term Investment strategic work we have shown that it will take several periods to ensure the short and medium life (MEICA) assets are being replaced at the right time and we are making progress to replacing long life assets. Further work is required to get a better understanding of this analysis in SR27 to take account of condition, different asset lives and where there is an expectation repairs could impact the expected life. We welcome the opportunity to discuss this further.

The summary tables have been generated by collating all the lines into either civils, MEICA, water or wastewater infra to help summarise the surplus of deficit.

5.2.1 Lines 3a.1-3a.31 Water

Over the 6yr period of SR27 the asset replacement Surplus / Deficit is c.£880m in deficit. This is a factor of the generic asset lives and average unit rates being used at this high level.

Category	Asset replacement Surplus / Deficit over the 6 year period of SR27	Total MEAV
Civils	-£117m	
MEICA	-£229m	

Service reservoirs	-£138m	
Water Mains (trunk, distribution and raw water mains)	-£489m	
Water meters	-£ 79m	
Other (Surplus)	£169m	
Total	**-£883m**	**£31,217m**

Table 7: Water assets - Asset replacement Surplus / Deficit over SR27

Table 7 shows a 3% deficit in water assets replacement investment over the 6yrs. Over the 24 year period 2027 to 2051 we anticipate that after taking into account asset condition, the effective age of assets and operability measures the asset replacement surplus / deficit will be addressed for MEICA and CIVIL assets based on the funding profile used to develop the LTIS position 2 (assumed asset replacement life extension).

5.2.1.1 Lines 3a.1-3a.31 Foul Sewage & Surface Water Shared Assets

Over the 6 year period of SR27 the asset replacement Surplus / Deficit is c.£380m in deficit. This is a factor of the generic asset lives and average unit rates being used at this high level.

Category	Asset replacement Surplus / Deficit over the 6 year period of SR27	Total MEAV (excluding sewers)
Civils	-£83m	
MEICA	-£364m	
Rising mains	-£12m	
Sewers*		
Other (Surplus)	£78m	
Total	**-£381m**	**£9,056m**

Table 8: Foul Sewage & Surface water shared assets - Asset replacement Surplus / Deficit over SR27

*sewers are not replaced they are repaired or the condition improved through refurbishment so are excluded from this table and analysis.

Table 8 shows a 4% deficit in Wastewater foul sewage and surface water shared assets replacement investment (excluding sewers) over the 6yrs. Over the 24 year period 2027 to 2051 we anticipate that after taking into account asset condition, the effective age of assets and operability measures the asset replacement surplus / deficit will be addressed for MEICA and CIVIL assets based on the funding profile used to develop the LTIS position 2 (assumed asset replacement life extension).

As an example, work is ongoing over SR21 and into SR27 to assess the emerging demand within the wastewater pumping (rising mains) asset category.

- Data Improvement Actions:

    - Improve the recording of pumping main bursts against specific asset records, including root cause and impact.
    - Develop a more granular section-based definition of criticality to avoid over-estimating the length of critical mains.
    - Ensure consistent recording of pumping main bursts and improve burst data to enhance deterioration assumptions.
- Climate Change Considerations:
    - Monitor failure rates during extreme weather events and assess the impact of climate change on asset deterioration.
    - Consider erosion risks along watercourses and coastal areas when planning replacements

5.2.1.2 Lines 31.50-3a.62 – Foul Sewerage Only

Over the 6 year period of SR27 the asset replacement Surplus / Deficit is c.£85m in deficit. This is a factor of the generic asset lives and average unit rates being used at this high level.

Category	**Asset replacement Surplus / Deficit over the 6 year period of SR27**	**Total MEAV (excluding sewers)**
Civils*	-£13m	
MEICA*	-£56m	
Sewage / sludge rising main*	-£16m	
Other (Surplus)	£0m	
Total	**-£85m**	**£467m**

Table 9: Foul Sewerage Only - Asset replacement Surplus / Deficit over SR27

*the LTIS does not currently break these assets out from foul and surface water shared assets

Table 9 shows a 18% deficit in Wastewater foul sewage assets replacement investment (excluding sewers) over the 6yrs. Over the 24 year period 2027 to 2051 we anticipate that after taking into account asset condition, the effective age of assets and operability measures the deficit will be reduced.

5.2.1.3 Line 3a.63 to 3a.77 - Surface Water Only

Over the 6-year period of SR27 the asset replacement Surplus / Deficit is c£7m in deficit. This is an emerging area and more work is required to ensure the correct assets are assigned to this function. This will be part of the further capability work outlined in Annex A of the Investment Planning Technical Appendix. This deficit is a factor of the generic asset lives and average unit rates being used at this high level.

Category	Asset replacement Surplus / Deficit over the 6 year period of SR27	Total MEAV (excluding sewers)
Civils	-£2m	
MEICA	-£4m	
Other (Surplus)	-£1m	
Total	**-£7m**	**£46m**

Table 10: Surface Water Only - Asset replacement Surplus / Deficit over SR27

This is part of an emerging asset area that will need additional focus to SR27 to ensure the correct assets are captured in this section and the asset replacement lives and MEAV are understood.

5.2.1.4 Lines 3a.78 to 3a.84 -Shared Services

Over the 6-year period of SR27 the asset replacement Surplus / Deficit is c£122.8m in surplus primarily driven by Digital

- Line 3a.79 the cumulative surplus on Digital assets is due to the lives being shorter than normal MEICA and Civil assets and potentially replaced several times in a period which the formula does not allow for. It is proposed to assess between DBPP and FBP if this analysis is suitable or required for these types of assets.
- Line 3a.81 renewable energy currently does not have an associated MEAV so we will provide that for the Final Business Plan (FBP) submission
- Line 3a.80 The Facilities and Estates investment tends to be required to ensure compliance with legislation and refurbishment of existing builds so does not tend to replace assets. This will be reassessed for the (FBP) submission to assess what is true replacement.

Category	Asset replacement Surplus / Deficit over the 6 year period of SR27
Vehicles	+£3m
Digital	+£75m
Facilities & Estates	+£12m
Renewable Energy	+£23m
Scientific services	+£8m
Other	+£1m
Total	**£122m**

Table 11: Support Services - Asset replacement Surplus / Deficit over SR27

Further work on this asset group is required to undertake a review of MEAV, asset lives and the allocation of investment to “replacement” in SR27 for each of these areas before any conclusion can be drawn on whether the right economic level of investment is proposed.

6 Block E: Average Annual Capital Expenditure by Scenario (£m) (2024-25 Price Base)

6.1 Column 26 & 27 - Average annual capital expenditure over SRC27 period under (Reference) Scenario A

This is an auto calculated field to show the average annual investment value for each asset category. No commentary has been provided for this data.

6.2 Column 28 & 29 - Average annual capital expenditure over SRC27 period under Scenario B

This field to show the average annual investment value has increased for the following asset category under Scenario B (high).

- Line 3a.12 WTW MEICA – Investment to allow increased water quality improvements in assurance, manage operational problems, Chemical Storage and Dosing, High Voltage (HV) Water treatment, SCADA, HMI, and PLC.
- Line 3a 22 Water mains Investment to allow further improvements in water discolouration (flushing and mains replacement).

6.3 Column 30 & 31 - Average annual capital expenditure over SRC27 period under Scenario C

This field to show the average annual investment value reduction for each asset category under Scenario B (low).

- Line 3a 22 Water mains AC A reduction in the mains replacement (20% reduction on current scenario A investment) which is equivalent to 270km of mains replacement out of a total 1350km.
- Various lines – There would be a reduction of 50% in non-regulatory inspection which will reduce expenditure by £80m in total. This can be seen across multiple rows within Business Plan table 3a

7 Block E: Average Annual Capital Expenditure by Scenario (£m) (2023-24 Price Base)

For draft Business Plan the figures are presented in 2023-24 prices.

Scenario B & C have been populated based on the same methodology as Scenario A with only the summarised annual rate shown in the table.

7.1 Scenario Overview - Scenario B

CPI + 5 % - Delivering more for customers into the future. Circa £29m per annum increase in maintenance expenditure. £172m total increase in investment to secure water quality. Split £145m in replacements and £27m for repair and refurbishments.

7.1.1 Key differences from Scenario A – Scenario B

Increased investment of £147m (circa. £25m per annum). Allowing increased water quality improvements in assurance, manage operational problems, Chemical Storage and Dosing, High Voltage (HV) Water treatment, SCADA, HMI, and PLC. Reference row 3.a12.

Increased investment of £25m (circa. £4m per annum). Allowing further improvements in water discolouration. Reference row 3a.20.

The impact of Scenario B on AR3 is predominantly in additional investment in WTW MEICA (15% increase on current scenario A investment) and mains flushing / iron pipe replacement. Where flushing will not impact the EHI score.

7.2 Scenario Overview - Scenario C

CPI + 3% - Address the problems we can today.

This scenario removes c£420m of proposed investment in water and waste-water services compared to the Reference Scenario. Within the AR3 investment we anticipate £175m of potential reductions (40%). It is our judgement that following the work to produce the Reference Scenario, no further reductions could be made regarding the delivery of our regulatory duties, including the level of maintenance expenditure require to maintain essential services.

Reduce investment by £175m, reducing by 50% our planned investment in asset inspections (£80m), limiting our capacity to deliver proactive maintenance strategies in the SR27 period, pausing some work until the mid-point of the period to support planning for SR33. Additionally reducing distribution mains renewal to 250km/yr. Holding recurring customer interruptions stable, not reducing. ITS & burst rates volatile and continuing to trend upward. Split £132m in replacements and £43m for repair and refurbishments.

The impact of Scenario C on AR3 is in the reduction in:

- AC mains replacement (20% reduction on current scenario A investment) which is equivalent to 270km of mains replacement out of a total 1350km.

8 Improvement Plans

8.1 Draft to Final

- Update Asset register to reflect AR25 asset register.
- MEAV to be updated to reflect and align with the SR25 asset register
- Update investment figures to show 24/25 price base
- No expected change to the methodology for calculating the MEAV. Due to a conversion factor discrepancy, the total MEAV in Business Plan table 3a is different from AR24 table G. This will be addressed for the final submission.
- No expected change to the unit cost assumptions to calculate the MEAV for AR25
- For the final submission an analysis of 25yrs cumulative surplus (Column 25) could be provided if requested as this provided a more holistic view of whether there is sufficient investment in each category

8.2 Future

- Improve alignment of Annual return table G and the Business plan Table 3a asset categories to disaggregate the MEAV and asset stock.
- Improve the asset degradation model coverage

Table 3b: Asset Health Commentary

Contents

1 Background

1.1 Purpose

Table 3b captures the health of the asset base in the base year (as at 31 March 2025) with projections (currently using March 2024 data), to the end of the SR27 period as impacted by the Asset Repair, Refurbish, Replacement (AR3) investment proposed in the Draft Business Plan (DBP), and at the end of Scottish Water's Long-Term Investment Strategy (LTIS) period in 2050-51 as impacted by the long-term planned AR3 investment in SR33, SR39 and SR45 periods.

Asset health is reported for those assets which Scottish Water has model information on (referred to as 'modelled assets'). This assessment of health is being undertaken to understand the potential requirements for asset replacement over SR27 and the longer term, where the data is used to indicate whether replacement interventions are keeping pace with deterioration and to determine whether it can provide further insight into emerging asset risks.

Scottish Waters "Equipment Health" refers to the capability of an asset to perform its intended function effectively. It is a conceptualised measure that indicates an asset's overall condition and performance and will help to understand if there is a risk of failure impacting service. Equipment Health will be assessed by considering the modes of failure that would affect the value provided by the asset.

It is recognised by Scottish Water and WICS that this is a new business requirement and that the **Equipment Health Index (EHI) and calculations are at an early stage of development.** As a result of our planned improvement programme (further detail in Section 4), the data completeness, methodology and confidence grade within these tables will be improved over the next 6 years. Therefore, it should be noted that examples of analysis provided within this submission may change as improvement activities are undertaken. Examples of analysis are provided with the caveat of the potential changes over the next 2 years as we focus on improving 10 asset areas to SR27 and the remaining areas in SR27.

We will be continuing to refine our methodology between the DBP and Final Business Plan (FBP) submissions and undertake further validation checks as we do so.

All investment is currently shown in 23/24 price base and it will be updated to 24/25 for the Final Business Plan Submission.

1.2 Commentary Content

This Commentary sets out an overview for each of the Blocks of information required in Table 3b – Asset Health. There is an overview table followed by sections that explain the approach taken to calculating the information for each of the lines. This document is set out as follows:

- Overview of Table
- Overview of Equipment Health
- Block A: Assets
- Block B: Asset Health Under (Reference) Scenario A
- Block C: Asset Health Under Alternative Scenarios

The tables have been prepared in line with the requirements set by WICS Business Plan Guidance and Definitions.

This report is complemented by the Investment Planning Technical Appendix.

EHI commentary has been provided as examples of what could be provided in the FBP submission. We would invite a conversation with WICS to discuss what would be most helpful to support a FBP submission.

1.3 WICS Requirements

The following requirements have been taken from the WICS Business Plan Guidance and Definitions[1]

- This table captures the health of the asset base in the base year (as at 31 March 2025) of the SR21 period, at end of the SR27 period as impacted by the asset replacement investment projections proposed in the business plan, and at the end of Scottish Water's Long-Term Investment Strategy (LTIS) period in 2050-51 as impacted by the long-term planned asset replacement expenditure in SR33, SR39 and SR45 periods.
- This assessment is being undertaken to understand the potential requirements for asset replacement over SR27. The data can be used to check whether replacement interventions are keeping pace with deterioration and to determine whether it can provide further insight into emerging asset risks.

The current asset health is reported for those assets which Scottish Water has relevant information on. Projections for the end of SR27 and 2050-51 are provided where we have an asset replacement model (referred to as 'modelled assets').

As recognised in the WICS methodology the EHI measure is at an early stage of maturity and will require further development during the SR27 period. As such, the DPB includes a capability improvement plan (See Investment Plan Annex A) to address the data and knowledge gaps in its asset condition reporting and forecasting.

1.4 Equipment Health index band definitions

Asset lifetime is defined as the amount of time (measured in years) that elapses from installation to the end of the asset's useful life (the point at which the asset is decommissioned and replaced with an alternative means of providing the service). The SR27 Final Methodology (section 3.2.3) includes a definition for network assets. Scottish Water has also included a definition for non-network assets, included in the Table 1 below.

[1] https://wics.scot/system/files/2024-12/SR27-Business-Plan-Guidance-and-Definitions.docx

Table 1 Equipment Health Index band definitions

Band	Description from Final Methodology	Scottish Waters additional description to cover other assets
1	Length of network with actual asset age less than 65% of expected asset life	% of assets with actual asset age less than 65% of expected asset life
2	Length of network with actual asset age between 65% and 85% of expected asset life	% of assets with actual asset age between 65% and 85% of expected asset life
3	Length of network with actual asset age between 85% and 100% of expected asset life	% of assets with actual asset age between 85% and 100% of expected asset life
4	Length of network with actual asset age more than 100% of expected asset life	% of assets with actual asset age more than 100% of expected asset life
X	Unable to quantify	Unable to quantify

Each of the EHI sections forecasts the percentage of the total number (or length) of assets for each asset line which falls under each EHI band. The sum across EHI1 - 4 and EHI X totals 100%.

1.5 Development of the Equipment Health Index (EHI)

Scottish Water is currently developing and utilising the Basic EHI model, which is based on asset age and the average expected life of assets in the same class. A composite of corporate data and reference tables are used to provide the range of past, current, and forecast information in EHI:

- Current asset data is used from Ellipse and GIS, which is updated monthly,
- Data held as annual 'snapshots' from Annual Returns to assess historical trends,
- To view the 25-year forecast, EHI uses the asset replacement output from the Long-Term (Level 1) model (May 2024) which is based on the full asset register, MEAV (with updated R2309 cost curves) to assess the future impact on proposed asset replacement, and constrained by the SR27 investment and funding profile.
- To calculate EHI scores, a reference table of expected lives per asset category is used, to assess which EHI category each asset sits within.

Scottish Water will continue to mature this calculation to incorporate additional asset parameters over SR27.

1.6 EHI calculations

EHI used in the Draft Business Plan submission is "Basic" which is based on the date of install and the current expected average age each asset category is expected to last. Some infill of missing data has been completed but this has been limited to avoid misrepresenting the EHI bands at this early stage of the use of the index. Further detail is provided on a data improvement plan in Section 4.

1.7 LTIS Position testing

A fundamental component of the EHI forecasting methodology is its ability to apply different LTIS positions to offer alternative average life spans for assets. Due to the asset age profile, the rate at which assets are reaching the end of their calendar life is increasing so assets need to be assessed to see whether they need to be replaced. An assumption made in the Long Term Investment Strategy (LTIS) projections is that the assets may not be reaching the end of their actual life, just their theoretical calendar (average expected) life. In part this could be attributed to operational maintenance or repair/refurbishment interventions or the network configuration. To assess the impact of these, two LTIS positions have been defined.

LTIS Position 1 assumes that assets will be replaced once they have reached their average expected life.

LTIS Position 2 assumes that the life of the asset can be extended somewhere between 5% and 20% depending on the type of asset. For example, a 20% increase on a 150-year asset life expectancy adds 30 years which will change the 25-year forecasting significantly.

The physical nature of the asset influences many deterioration factors and thus life extending options. The benefits of extending civils assets are greater in the broader sense over MEICA assets as they rely on less or have no moving parts and materials such as concrete are less susceptible to quicker deterioration. It is anticipated (but still to be proven and validated) that through the current inspection and repair programmes we can expect these assets to last longer. Currently we have assumed a 20% life extension for Civil assets. The table shows that the best forecast for a MEICA asset is 1 to 3 year life extension, so would still predominantly fall into the 25yr period for replacement. Table 2 shows a summary of life extensions expressed as a percentage of the theoretical age baseline (highlighted blue below) used in LTIS position 2 analysis. The other bands are options that can be chosen in the model to provide a sensitivity analysis. There was no extension to AC mains as our analysis shows that this does need to be replaced within the next 25yrs.

Table 2 Extending the average asset life with two possible LTIS positions

Asset Category	Asset Age Baseline (yrs)	5%	10%	15%	20%
		(Position 1)		(Position 2)	
MEICA – Short	**15**	15.8	16.5	17.3	18
MEICA – Medium	**25**	26.3	27.5	28.7	30
MEICA – Long	**35**	36.8	38.5	40.3	42
Civils	**84**	88.2	92.4	96.6	100.8
Distribution – non-AC / UPVC	**111**	116.6	122.1	127.7	133.2
Trunk – non-AC	**123**	129.2	135.3	141.5	147.6

Asset Category	Asset Age Baseline (yrs)	5%	10%	15%	20%
Distribution – UPVC			*Not currently broken out*		
Distribution – AC	**88**	92.4	96.8	101.2	105.6
Trunk - AC	**88**	92.4	96.8	101.2	105.6

Each year the model runs, a given asset is either earmarked for replacement based on its age, or the asset is within an acceptable range.

1.8 Key assumptions

Over all the methods there have been some key assumptions made:

- Operational maintenance is carried out on assets to ensure the assets can achieve their average expected life
- The demand projections are based on March 2024 asset register
- The Investment projections are using RO2309 unit costs that are used to produce the MEAV. The cost of temporary works to manage a live site is not currently included.
- The assets are grouped and so the expected asset lives are not as granular and so can only provide a generic rather than specific site view.
- The models are run 5,000 times to create a view so is generically correct (across Scotland) but will be specifically wrong for an individual asset on a specific site.
- Asset replacement is based on age only. For near term planning and tactical implementation of what gets replaced this will be based on inspection and assessment of the economic repair / refurbishment or replacement of that asset.

2 Overview of Table 3b: Asset Health

Table 3 Overview of Table 3B: Asset Health

Column Reference	Column Title	Description	Units	SW comments
N/A	Block A: Assets	Assets are split into three categories: Modelled Assets, Infinite-Life Assets and Unmodelled Assets. The Modelled Assets are classified as per Scottish Water's Level 1 asset models. The Infinite-Life Assets and Unmodelled Assets follow the classification in DBP table 3a.	N/A	Table 3b is split into three asset sections modelled, infinite life and non-modelled assets groupings: The **modelled assets** are predominantly Civil, MEICA or water mains and are covered by the Level 1 asset replacement model and the repair projections. **Infinite** life assets are very long-life assets (sewers, dams, aqueducts), it is assumed these are repaired rather than replaced. The **Unmodelled assets** are those not covered by the Level 1 asset replacement model and are not covered by the current long life asset model (Meters, rising mains, raw water mains, Combined Sewer Overflows (CSOs), outfalls, support services (vehicles, digital services, offices estates, buildings, renewable assets, nature based assets). **The asset count used in this table are different from DBP Table 3a column 15 (number of assets). DBP Table 3a counts the assets at unit level whereas in DBP Table 3b the assets are counted at equipment level where available and at unit level where they are not. This allows more granular detail of EHI**
1 to 6	Asset ealth as at 31 March 2025 (% total assets) Confidence grade	The percentage of the total number of assets for each asset line which falls under each EHI band as at 31 March 2025. The sum across columns 1 to 5 should total 100%.	%	The DBP submission uses the March 25 asset register and will be updated to reflect the Annual Return 25 register for the Final Business Plan Submission. **The Equipment Health Index methodology is based on "basic" – age only and a limited infill methodology. This will evolve over 2025-2027 and focus will be on 10 asset categories to move to EHI "intermediate" for the start of SR27.** Values provided to the nearest 1% Confidence grades are all C5 as the EHI is currently only using date of install and the average expected life for each equipment category. This will improve over SR27 as EHI matures to include asset condition and an improved weighting calculation.
7 and 8	Total SR27 maintenance expenditure (£m) (2024-25 price base)	These columns are calculated fields which bring forward the expenditure from DBP table 3a.	£m in 2024-25 price base	These fields are automatically populated from DBP Table 3a
9 to 14	Asset health as at 31 March 2033 (% total assets) Confidence grade	The forecast percentage of the total number of assets for each asset line which falls under each EHI band as at 31 March 2033. The sum across columns 9 to 13 should total 100%.	%	The EHI to March 2033 is based on a projection of asset replacement using Annual Return 24 data and SR27 (IPS) investment for Asset Replacement only and does not include the impact of repairs or current condition. The replacement model (level 1) has been financially constrained to reflect the IPS asset replacement projection. The model used to support EHI projections is not sufficiently detailed to identify the asset replacement investment by each management approach so is not a true reflection of each Management approach allocation or Table 3a investment at a line by line level. It is based on the average

Column Reference	Column Title	Description	Units	SW comments
				lives (see appendix A), the 2024 annual return asset register which uses March 24 asset register and the MEAV calculated for the annual return at that point. This will be updated for the AR25 asset register for the FBP submission. Values provided to the nearest 1% The number of assets included in each asset category is different from DBP Table 3a as EHI uses a more granular equipment level category where it is available. DBP Table 3a is more reflective of the unit level category (one level up from equipment). Overall the confidence grade is C5 across all EHI due to the maturity of the methodology and on-going data improvement work.
15 to 17	Long-term planned maintenance expenditure (£m) (2024-25 price base)	The long-term planned maintenance expenditure as per Scottish Water's Long-Term Investment Strategy for each of the subsequent regulatory period: SR 2033-39, SR 2039-45 and SR 2045-51.	£m in 2024-25 price base	Cost base is currently 23/24 it will be updated to 24/25 for the Final Business Plan Submission. The LTIS projection (2027 – 2051) is based on an unconstrained funding for repair and replacement with the assumption that asset lives can be extended, see Note 1 (below). The investment profile assumes that all forecast investment need will be met by 2051 i.e., the AR3 Long Term investment projection has remained at £26bn over the 4 periods. This has meant that as SR27 has a constrained investment then the residual investment has been profiled into future periods up to 2051. In the calculation of need, the asset replacement projection assumes repairs and operational technology will extend the life of the majority of assets. This assumption will be tested throughout SR27 to validate the assumptions Note 1 The assumption on the average expected life of each asset group is Civil assets +20%, Water mains (distribution and trunk mains) +15% (excluding asbestos cement material). MEICA +5 (very short life asset) to 10% (medium life assets).
18 to 23	Asset health as at 31 March 2051 (% total assets) Confidence grade	The forecast percentage of the total number of assets for each asset line which falls under each EHI band as at 31 March 2051. The sum across columns 18 to 22 should total 100%.	%	The asset replacement projection is based on Values provided to the nearest 1% SR27 proposed investment is delivered and unconstrained funding for remaining periods. All asset replacement 2027 – 2051 is completed in the timeframe, i.e., slippage in SR27 will be caught up in future periods to 2051. The asset replacement projection assumes repairs and operational technology will extend the life of the majority of assets. The assumption on the average expected life of each asset group is Civil assets +20%, Water mains (distribution and trunk mains) +15% (excluding asbestos cement material). MEICA +5 (very short life asset) to 10% (medium life assets). Overall the confidence grade is C5 across all EHI due to the maturity of the methodology and on going data improvement work.

Column Reference	Column Title	Description	Units	SW comments
24 to 35	Block C: Asset Health Under Alternative Scenarios Confidence grade	The Scenario B and Scenario C forecast percentage of the total number of assets for each asset line which falls under each EHI band as at 31 March 2033. The sums across columns 24 to 28 and across columns 30 to 34 should each total 100%.	%	Scenario B includes an increase in investment to address discoloration (through mains flushing and targeted expenditure on critical chemical dosing & control equipment) Scenario C incudes a reduction in mains investment (reduction from 300km/yr to 250km/yr) and reduction in inspections. While reduced inspections (~60%) will not change the asset condition it will reduce our ability to improve the reporting of the EHI measure. Overall the confidence grade is C5 across all EHI due to the maturity of the methodology and on going data improvement work.

3 Block A – List of Assets in each Asset Category

3.1 Overview

The table is split into three asset sections: modelled; infinite life; and non-modelled assets groupings.

1. The **modelled assets** are predominantly Civil, MEICA or water mains and are covered by the Level 1 asset replacement model and repair projections.
2. **Infinite** life assets are very long-life assets (sewers, dams, aqueducts), It is assumed these are repaired rather than replaced.
3. The **non modelled assets** not covered by the current long life asset replacement model (Meters, rising mains, raw water mains, CSOs, outfalls, support services – vehicles, digital services, offices estates, buildings, renewable assets, nature-based assets). This will be a mixture of Asset replacement and repair and the projections have been assessed with the relevant Asset management owner.

3.1.1 Data Capture

Scottish water has 2 corporate systems that hold asset information.

1. Ellipse – holds predominantly the above ground assets (e.g. water treatment works, pumping stations)
2. GIS – holds the water and wastewater below ground (e.g. pipes)

Ellipse has an asset hierarchy set out in Table 4. EHI uses level 5 (equipment level) and where an asset is not held there it will use level 3.

Table 4 Ellipse Hierarchy

Asset categories	Description	Examples
Level 1	Geographical area - Location	A discrete and defined geographical area under the responsibility of Scottish Water. A location may hold one or more sites.
Level 2: Site (function)	A site that performs a specific function	Combined Sewer Overflows; Dams and Impounding Reservoirs; Ground Water Sources; Non-Operational Buildings; Raw Water Intakes; Raw Water Pumping; Secondary Disinfection; Sewage Pumping Station; Sewer Structures; Sludge Treatment Centres; Sewage Treatment Works; Treated Water Pumping; Treated Water Storage and Water Treatment Works.
Level 3: Stage (process)	A collection of Units, which contribute to a specific stage within a site	Chemical Treatment, Filtration, Disinfection, Screening, Primary Treatment, Sludge Handling, etc.
Level 4: Unit	A logical grouping of equipment level assets that perform a given task.	A sludge Processing Unit is not a physical off-the-shelf item, but several pieces of equipment put together. Other examples include Screening

Asset categories	**Description**	**Examples**
		Unit, Sedimentation Tank, Oxidation Ditch, Contact Tank, Chlorination Unit, Rapid Gravity Filter, etc
Level 5: Equipment	An individual item forming part of a Unit	Pump, Scraper Bridge, Chlorinator, Detritor, Valve, blower, compressor, membrane filter etc
Level 6: Component [2]	Elements that make up the equipment	pump motor, propeller, starter, cable, guide rail, lifting chain.

Table 5 describes the asset structure in GIS.

Table 5 GIS asset structure

Water	**Zone or area which the assets sit within**	**Example of assets held**
	Water Resource Zone (WRS)	All assets from abstraction, treatment, storage and distribution.
Catchment		Raw water mains
Region	Water Operational Area (WOA)	Treatment, treated water storage and distribution
Zone	Water supply zone (WSZ)	Trunk mains
Network	District Metering Area (DMA)	Distribution mains (all material types)
Waste water	**Zone or area which the assets sit within**	
Region	Drainage Operational Area (DOA)	Sewers (combined, foul only and surface water)
Sub-Catchment	Topographical area for hydrological processes	Ridges and valleys

[2] level 6 is not currently used across all equipment assets.

Table 6 gives an indication of the typical assets found in each asset category line.

Table 6 Typical assets in each DBP Table 3a & 3b asset category

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Main assets included
3b.1	3a.9	Water	Source	Ground Water Sources	Civil	Above and below ground structures to house equipment
3b.2	3a.10	Water	Source	Ground Water Sources	MEICA	Pumps, MCCs, controls, telemetry
3b.3	3a.1	Water	Source	Raw Water Pumping	Civil	Above and below ground structures to house equipment
3b.4	3a.2	Water	Source	Raw Water Pumping	MEICA	Pumps, MCCs, controls, telemetry
3b.5	3a.11	Water	Water Treatment	Water Treatment Works	Civil	Above and below ground structures to house equipment, storage tanks for chemicals, contain water, contact tanks, filters, filter media etc
3b.6	3a.12	Water	Water Treatment	Water Treatment Works	MEICA	Pumps, chemical dosing systems, instrumentation, controls, telemetry, SCADA, wiring, low / high voltage electrical systems, sludge treatment and backwash systems, blowers, valves, cranes
3b.7	3a.13	Water	Water Network	Treated Water Pumping	Civil	Above and below ground structures to house equipment
3b.8	3a.14	Water	Water Network	Treated Water Pumping	MEICA	Pumps, MCCs, controls, telemetry
3b.9	3a.15	Water	Water Network	Treated Water Storage	Civil	Storage tanks, concrete, pre-stressed concrete, steel, above and below ground.
	3a.16	Water	Water Network	Treated Water Storage		
3b.10	3a.15	Water	Water Network	Treated Water Storage	MEICA	MCCs, telemetry comms link, level indicators
	3a.16	Water	Water Network	Treated Water Storage		
3b.11	3a.17	Water	Water Network	Water Trunk Mains (excl. Asbestos Cement)	Infra	Potable water mains of a notional diameter equal or greater to 300mm. All materials excluding asbestos cement. (UPVE, MDPE, HPPE, ductile iron, spun iron)
	3a.18	Water	Water Network	Water Trunk Mains (excl. Asbestos Cement)		
3b.12	3a.19	Water	Water Network	Water Trunk Mains (Asbestos Cement)	Infra	Potable water mains of a notional diameter equal or greater to 300mm. Only Asbestos cement pipe material
3b.13	3a.20	Water	Water Network	Water Distribution Mains (excl. Asbestos Cement)	Infra	Water distribution mains with a diameter <300mm at any depth. Includes pressure regulated pipes. All materials excluding asbestos cement. (UPVE, MDPE, HPPE, ductile iron, spun iron)
	3a.21	Water	Water Network	Water Distribution Mains (excl. Asbestos Cement)		
3b.14	3a.22	Water	Water Network	Water Distribution Mains (Asbestos Cement)	Infra	Water distribution mains with a diameter <300mm at any depth. Includes pressure regulated pipes. Only Asbestos cement pipe material
3b.15	3a.37	Wastewater	Wastewater Network	Sewage Pumping Stations	Civil	Above and below ground structures to house equipment (kiosks, brick, concrete structures), access roads, fences, paths,
	3a.52	Wastewater	Wastewater Network	Sewage Pumping Stations		
	3a.65	Wastewater	Wastewater Network	Sewage Pumping Stations		
3b.16	3a.38	Wastewater	Wastewater Network	Sewage Pumping Stations	MEICA	Pumps, MCCs, controls, telemetry, cranes, lifting chains, manholes, instrumentation.
	3a.53	Wastewater	Wastewater Network	Sewage Pumping Stations		
	3a.66	Wastewater	Wastewater Network	Sewage Pumping Stations		
3b.17	3a.42	Wastewater	Wastewater Treatment	Sewage Treatment Works	Civil	Above and below ground structures to house equipment, storage tanks for chemicals, contain wastewater tanks, filters, filter media etc
	3a.44	Wastewater	Wastewater Treatment	Sewage Treatment Works		

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Main assets included
	3a.57	Wastewater	Wastewater Treatment	Sewage Treatment Works		
	3a.59	Wastewater	Wastewater Treatment	Sewage Treatment Works		
3b.18	3a.43	Wastewater	Wastewater Treatment	Sewage Treatment Works	MEICA	Pumps, chemical dosing systems, instrumentation, controls, telemetry, SCADA, wiring, low / high voltage electrical systems, sludge treatment systems, blowers, valves, cranes, odour control
	3a.45	Wastewater	Wastewater Treatment	Sewage Treatment Works		
	3a.58	Wastewater	Wastewater Treatment	Sewage Treatment Works		
	3a.60	Wastewater	Wastewater Treatment	Sewage Treatment Works		
3b.19	3a.46	Wastewater	Wastewater Treatment	Sludge Treatment Centres	Civil	Above and below ground structures to house equipment, storage tanks for chemicals,
3b.20	3a.47	Wastewater	Wastewater Treatment	Sludge Treatment Centres	MEICA	Digesters, holding tanks, centrifuges, screens, drum thickener, poly-dosing systems, instrumentation, pumps and pipework / valves.
3b.21		**Total Modelled Assets**				
EHI is not provided for the group of assets below.						
3b.22	3a.4	Water	Source	Infinite-Life Assets	Dams and impounding reservoirs	Dams and impounding reservoirs (concrete buttress, earth filled embankments, masonry, concrete tanks over 25ML)
3b.23	3a.5	Water	Source	Infinite-Life Assets	Dam ancillaries	Valve tower bridge, valve towers, valves, access roads, road bridges, security fencing
3b.24	3a.6	Water	Source	Infinite-Life Assets	Raw water storage (civils)	Storage tanks, concrete, pre-stressed concrete, steel, above and below ground.
3b.25	3a.7	Water	Source	Infinite-Life Assets	Aqueducts	Aqueducts - Underground assets that typically convey raw water by gravity from raw water sources (Dams Impounding Reservoir (DIR), Raw Water Intake (RWI), Groundwater Source (GWS)) to water treatment works (WTW). Some of our asset base also convey water between WTWs. As opposed to tunnels, water is conveyed within the aqueduct structure itself and not within a separate pipeline. Aqueducts are complex assets that that can be formed of multiple sub-parts including siphons, bridges and tunnels (different to tunnel assets discussed below).Other components that can be found on aqueduct assets include outlet basins, air shafts, flumes, markers, gates, stiles, culverts, cundies, drains, junction chambers, overflows, air valves, access chambers, scour chambers, valve houses, reflux chambers, by-wash, non-SW owned roads & verges maintenance and land. Tunnels - Underground passages built to convey water under hillsides, water courses, roads, railway lines. Tunnels contain water mains, typically of a diameter greater than 300mm, that convey potable or non-potable water within the network. Tunnels allow for easier access to the pipeline when there is a need for repair. Ducts are other underground passages, only marginally wider than the pipe it contains and often filled with grout to seal the area between the pipe and the walls.
3b.26	3a.8	Water	Source	Infinite-Life Assets	Raw water intakes (gravity)	Structures, screens, instrumentation
3b.27	3a.40	Wastewater	Wastewater Network	Infinite-Life Assets (Combined)	Vitrified clay	Clay gravity pipes at all depths – exclude laterals (main collection sewer to individual properties)
3b.28	3a.41	Wastewater	Wastewater Network	Infinite-Life Assets (Combined)	Other	Other pipe materials at all depths. Concrete, brick plastic
3b.29	3a.55	Wastewater	Wastewater Network	Infinite-Life Assets (Foul Only)	Vitrified clay	Sewer pipes with a material type of vitrified clay (No assets included in this line at present)
3b.30	3a.56	Wastewater	Wastewater Network	Infinite-Life Assets (Foul Only)	Other	No assets included in this line at present
3b.31	3a.68	Wastewater	Wastewater Network	Infinite-Life Assets (Surface Water Only)	Total	No assets included in this line at present
3b.32		**Total Infinite-Life Assets**				
3b.33	3a.3	Water	Source	Raw Water Mains	Total	Raw water mains - Non-potable water mains assets typically conveying raw water from water sources (DIR, RWI, GWS) to raw water storage and then to WTWs (or directly to WTWs).

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Main assets included
						Sub sea Pipes running under the sea and conveying water either from the mainland to an island or between islands. Sub-sea mains can carry potable or non-potable water. (currently not included in EHI)
3b.34	3a.23	Water	Water Network	Water Mains	Supply pipes	No assets included in this line at present
3b.35	3a.24	Water	Water Network	Water Mains	Communication pipes - lead	No assets included in this line at present – not investment of lead replacement is excluded from AR3 and included in Table 2.
3b.36	3a.25	Water	Water Network	Water Mains	Communication pipes - non-lead	No assets included in this line at present
3b.37	3a.26	Water	Water Network	Water Mains	Ancillaries	Pipe bridges are typically short in length, sufficient to span the specified obstacle (currently not included in EHI) Valves, meters, pressure relief valves (PRV), (currently not included in EHI)
3b.38	3a.27	Water	Water Network	Water Meters	Non-industrial customer water meters	Domestic meters 15mm – 33mm diameter
3b.39	3a.28	Water	Water Network	Water Meters	Industrial customer water meters	Non-domestic Meters 15mm to 600mm dia
3b.40	3a.29	Water	Water Network	Water Meters	Network water meters	District meters on trunk and distribution mains on the public network.
3b.41	3a.30	Water	Water Network	Water Meters	Ancillaries	No assets included in this line at present
3b.42	3a.32	Wastewater	Wastewater Network	Pumped Combined Rising Mains	Total	Wastewater rising mains (note not currently included in Level1 model asset replacement projections)
3b.43	3a.33	Wastewater	Wastewater Network	Gravity Sewers (Excluding Laterals and Private Sewers)	Total	Included in line 27/28
3b.44	3a.34	Wastewater	Wastewater Network	Laterals and Private Sewers	Total	No assets included in this line at present
3b.45	3a.35	Wastewater	Wastewater Network	Combined Sewer Overflow	Screened	CSO has a MEICA element e.g. powered screen
3b.46	3a.36	Wastewater	Wastewater Network	Combined Sewer Overflow	Unscreened	CSO has no MEICA element
3b.47	3a.39	Wastewater	Wastewater Network	Other Sewage Structures (Combined)	Total	For pipe bridge and overland sewer assets, the most used materials are steel and iron (ductile, cast, and spun)
3b.48	3a.48	Wastewater	Wastewater Network	Outfalls From Treatment (Combined)	Total	No assets included in this line at present
3b.49	3a.50	Wastewater	Wastewater Network	Sewage and Sludge Pumping Mains (Foul Only)	Total	Sludge mains only. All other WW pumped rising mains are contained in line 3b.42
3b.50	3a.51	Wastewater	Wastewater Network	Emergency Outfalls (Foul Only)	Total	No assets included in this line at present
3b.51	3a.54	Wastewater	Wastewater Network	Other Sewage Structures (Foul Only)	Total	No assets included in this line at present
3b.52	3a.61	Wastewater	Discharge	Outfalls From Treatment (Foul Only)	Total	No assets included in this line at present
3b.53	3a.63	Wastewater	Wastewater Network	Sewage and Sludge Pumping Mains (Surface Water Only)	Total	No assets included in this line at present
3b.54	3a.64	Wastewater	Wastewater Network	Emergency Outfalls (Surface Water Only)	Total	No assets included in this line at present
3b.55	3a.67	Wastewater	Wastewater Network	Other Surface Water Structures	Total	No assets included in this line at present

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Main assets included
3b.56	3a.69	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	SUDS	No assets included in this line at present
3b.57	3a.70	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Wetlands	No assets included in this line at present
3b.58	3a.71	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Reed beds	No assets included in this line at present
3b.59	3a.72	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Swales	No assets included in this line at present
3b.60	3a.73	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Rain gardens	No assets included in this line at present
3b.61	3a.74	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Total	No assets included in this line at present
3b.62	3a.75	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Surface Water Only)	MEICA	No assets included in this line at present
3b.63	3a.76	Wastewater	Discharge	Outfalls From Treatment (Surface Water Only)	Total	No assets included in this line at present
3b.64	3a.78	Water & Wastewater Shared Assets	Business Services	Support Services	Vehicles	Light vans, medium and large vans, trailers, excavators, tankers (various sizes), trailers.
3b.65	3a.79	Water & Wastewater Shared Assets	Business Services	Support Services	Digital	Data centre, Laptops, networks and communications, cyber security, applications / software, on premise infrastructure
3b.66	3a.80	Water & Wastewater Shared Assets	Business Services	Support Services	Facilities and estates	Offices, depots, estate / farm land and buildings, access roads / forestry track, redundant assets (reservoirs, treated water pumping sites, water treatment works, sewage treatment works) , fishing estates and structures, non catchment land holdings and structures,
3b.67	3a.81	Water & Wastewater Shared Assets	Business Services	Support Services	Renewable energy	Hydro turbines, Solar PV, Wind turbines, Combined heat and power systems (CHP) (buildings and structures covered under property and estates)
3b.68	3a.82	Water & Wastewater Shared Assets	Business Services	Support Services	Scientific services	Scientific laboratory equipment (ie centrifuges, chromatographs, desiccators and cabinets, fridges and freezers, hotplates and stirrers, miscellaneous equipment, nitrogen, generators, noise boxes, ovens, furnaces and incubators, radioactivity counters, shakers, solvent/acid cabinets, solid phase extraction (SPE) blocks)
3b.69	3a.83	Water & Wastewater Shared Assets	Business Services	Support Services	Other	None
3b.70		**Total Unmodelled Assets**				

4 Overall approach to Equipment Health Index (EHI)

4.1 EHI overview

Equipment Health refers to the capability of an asset to perform its intended function effectively. It is a conceptualised measure that indicates an asset's overall condition and performance and will help to understand if there is a risk of failure impacting service. Equipment Health will be assessed by considering the modes of failure that would affect the value provided by the asset.

The EHI assists Scottish Water in effectively managing its assets by understanding the implications of different investment LTIS positions on the asset base of the long term. Ultimately it will support showing how the change in asset risk will impact on the services provided to customers and the environment. By testing different LTIS positions, we can visualise whether long-term strategic objectives (Figure 1) for managing the asset base will be achieved.

Figure 1 AR3 Long Term Strategic Objectives

It can also help with tactical decisions on asset inspection, monitoring, and scheduling for replacement or repair.

4.2 Equipment Health Methodology

The methodology currently employed is based on a United Utilities framework, with Scottish Water developing it through three maturity levels: Basic, Intermediate, and Advanced. Further details on the maturity levels can be found below. This aligns to the work outlined in the capability improvement plan to support the maturity of our corporate and EHI metric.

4.3 ‘Basic’ EHI calculation

Scottish Water is currently developing the ‘Basic’ EHI model, which is based on asset age and the average expected life of assets in the same class. A composite of corporate data and reference tables is used to provide the range of past, current, and forecast information in EHI:

- Current asset data from Ellipse and GIS, updated in EHI monthly. Where an install date cannot be calculated, it is mapped to EHI X (Unable to quantify).
- Data held as annual ‘snapshots’ from Annual Returns to assess historical trends,
- For the 25-year forecast, EHI uses the asset replacement output from the Long-Term (Level 1) model (May 2024) which is based on the full asset register, and MEAV (with updated R2309 cost curves) to assess the future impact on proposed asset replacement,

- Expected lives are taken from a reference table of expected lives per asset category (which is also used in the analytical models). Expected asset life figures are calculated differently depending on whether it is an Infra or Non-Infra asset:
    - Infra-assets, the material of the pipe is associated with an expected life.
    - Non-infra assets within the corporate asset data repositories are associated with asset classes, which in turn are each associated with an expected life for the class.

The expected life reference tables used are shown in Appendix A – Expected Life Tables used for DBP Table 3b EHI and DBP Table 3a.

Figure 2 describes the 'Basic' EHI high-level process for utilising the above data sources and completing the EHI forecast figures in DBP Table 3b.

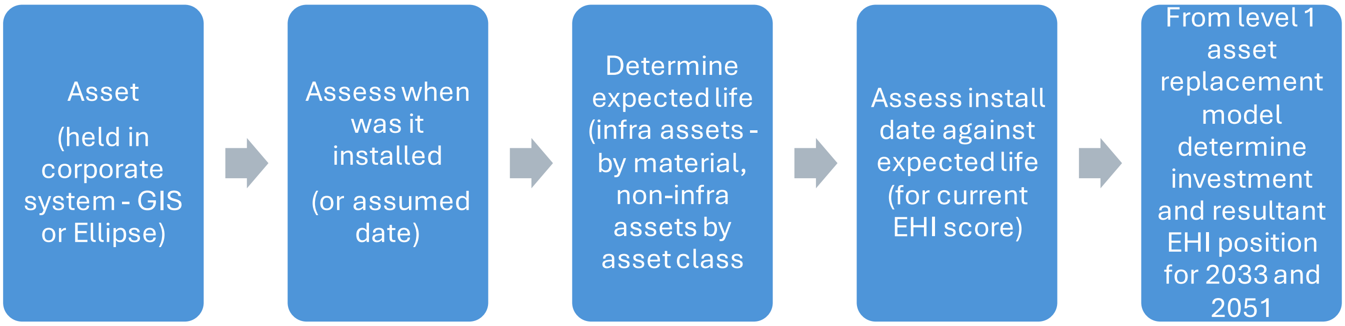


Figure 2 Process to forecast the 'Basic' EHI score

4.4 Overcoming data gaps in the 'Basic' EHI calculation

As part of our EHI maturity programme we will continue to evolve the quality and completeness of data that is used to calculate EHI. However, in the meantime to reduce the impact of missing dates of installation in EHI, several methodologies have been employed to "infill" data. These are set out in Table 7 and will be matured to the start of SR27.

Table 7 Data gap completion approach

Methodology	Description
Infill	Use the install date of the next level of the hierarchy. Where an asset is held at equipment level use the date of installation for the unit that the equipment is associated with. This is predominantly used with MEICA equipment. Where an asset is held at unit level use the date of installation for the function / site that the equipment is associated with. This is predominantly used with civil assets.
Cut-off	We calculate EHI using the "expected life" of the asset. Where no install date is available at Equipment or Unit, or the installation date is unlikely eg a 100-year-old tank, then assume the install date to be 105% (or variable) of the expected life.
Match	Where a pipe installation date is unlikely e.g. many years outside a window of likeliness, compare with other pipes in the same system (WSZ) matching on

Methodology	Description
	year, month, and material, to assume an install date for the pipe that's missing.
Expand Enquiry	We have three distinct "spikes" where a lot of pipes are assumed to have been installed. These may be first installation dates and a bulk upload from non-digitised data, so look at any dates of refurbishment if available, and possibly the method (e.g. slip lining) and use the refurb date in EHI. Where a pipe is connected to a postcode, use the earliest age of the properties that may have been connected to that pipe (data from a national post-code register). This is predominantly used with wastewater infrastructure pipes.
Resolve	For pipes of a material that did not exist, or the material was not "in production" at the date of installation, compare with other pipes in the same system and use their date of installation. At the very least, use the start date of production of the material as the installation date.

4.5 Current Exclusions from EHI

Assets not currently identifiable, not modelled or where there is insufficient information in the corporate systems, but proposed to be included in future are summarised below.

Water

- Reservoirs, aqueducts, dams, tunnels
- pipe bridges,
- dam ancillaries,
- water communication pipes / supply pipes
- Non-industrial, industrial and Network water meters

Waste water

- Sewers
- Outfalls From Treatment (Combined)
- Surface water emergency discharges and other structures
- Surface water storage / treatment (SUDS, wetlands, swales, reed beds, rain gardens)

Other areas

Support services

- Vehicles, digital services, offices estates, buildings, renewable assets

The LTIS also captures investment of future assets that will be installed as a result of forecast enhancement investment over the next 25 years that will need repair or replacement. The actual investment forecast is shown in line 3b.6 (WTW MEICA) and Line 3b18 WWTW MEICA). No EHI scores have been associated with this investment as they are future assets.

The mapping of assets into each asset category will be refined from DBP to FBP submission as we seek to ensure the relevant asset categories that require attention are visible within DBP Table 3b.

4.5.1 EHI Basic (current)

The 'Basic' EHI level assesses asset age and expected lifespan to provide an indicative measure, with scores primarily based on installation date and age, leading to lower confidence. This measure will serve as an interim baseline for asset health, showing historical trends and projections for replacements, and will be refined over time.

4.5.2 EHI Intermediate (2025 – 2028)

The Intermediate level of EHI refines the methodology by reducing reliance on installation dates and including weighted factors like condition and repair impact. Work order data can serve as a pseudo asset age for MEICA performance and inspection data for CIVIL assets. It provides more certainty through physical condition assessments and derived performance history from systems or telemetry.

4.5.3 EHI Advanced / hybrid (2028 – 2033)

The Advanced level of EHI offers a comprehensive assessment and improved confidence grade in the scores by including:

Environmental conditions in which the asset operates, asset criticality, and improved condition information.
Bringing in real-time telemetry/sensor data and AI modelling.
Enabling the possibility of proactive responses to asset conditions.

4.5.4 Data requirements evolution

As the EHI matures it will utilise a greater number of data points and types of data to provide greater confidence in the outputs. Table 8 below shows a sample of data points that would be needed to support the next levels of maturity (intermediate to advanced).

Table 8 Example Data Requirements for Maturity Levels

	Static	**Dynamic**
Condition Indicators	• What an asset is called • The purpose it serves • Where it is located • The asset's design life • The asset's size and the environment in which it operates.	• Age (installation / removal date) • Physical state of the asset, (condition grade, observed wear and tear) • Signs of, or projection of deterioration
Performance Indicators	• Capacity against original design • Reason for asset replacement---	• How well an asset is functioning (down time, run time etc) • Maintenance activities • The asset's productivity / capability (monitoring information)

	Static	Dynamic
Risk Indicators to evaluate the potential service risks associated with the asset	• Interdependency between assets • Impact of failures on the environment or service	• Changes in operational use • Likelihood of failure

4.5.5 Maturity development activities

4.5.5.1 Further work between Draft and Final Business Plan Submission that will improve EHI

Between DBP and FBP submissions we will:

- Refresh the asset inventory to reflect AR25.
- Revise the EHI assessment at April 2025 such that the score reflects this point in time.
- Continue to apply the infill methodology to include missing install dates.
- Reassess the estimate of asset repair and replacement for new assets installed during the 2027-51 period not currently in the asset register.

4.5.5.2 Further work prior to April 2027 will improve the EHI.

Beyond the FBP submission and prior to the commencement of SR27 we will:

- As appropriate, apply revised average expected lives following on from work ongoing to benchmark against other companies.
- Focus on the top 10 management approaches listed below Table 9 to include the asset data, i.e. known asset condition and apply an improved EHI methodology) to the scoring.

Table 9 Proposed Improvement Areas by MA for April 2027 & onwards

MA ref	MA Descriptor	SR27 draft allocation (23/24) £m
MA012	Wastewater Pumping Mains	140
MA057	Wastewater Treatment Works - Ancillaries	97
MA043	Wastewater Treatment Works - Secondary & Tertiary Treatment	159
MA017	Wastewater Treatment Works - Inlet Works	109
MA023	Wastewater Pumping Stations	140
MA111	Water Distribution Mains (including recuring ITS)	780
MA037	Treated Water Storage	390
MA114	Water Chemical Storage and Dosing	175
MA116	Water Strategic Infrastructure (Raw Water Mains, Sub Seas, & Trunk Mains)	194
MA094	Water Treatment Works - Process Stages Mechanical and Electrical	97

MA ref	MA Descriptor	SR27 draft allocation (23/24) £m
	Sub total	2,281

4.6 Other factors that may impact (cause revisions to) EHI projections

Models and modelling are constantly evolving. We will work to refine models to include asset condition assessment outputs, performance data, degradation trends and other measures that qualify an assets current and potential performance. Collecting this data and evolving our models is a continuous improvement activity and in line with our improvement approach Section 4.5.4.

Beyond the continual improvement of our base data described above and progress through EHI Intermediate to EHI Advanced, to ensure our models are representative and accurate we will also:

Consider revision of EHI projections should inspection reports or other observed condition data suggest the projection should be refined i.e. the observed condition is not in line with the projection assumptions.

Understand the impact of climate change on the asset base – i.e. how climatic changes affect asset condition and performance and therefore interventions required.

Through the asset management approach development work, ensure our understanding that the interventions proposed for particular circumstances/asset classes remain most economic. For instance, the impact of repairs on specifically civil structures and the resulting remaining life will be an important area to explore to assess the impact on replacement rates especially given the assumption made in LTIS position 2 around extending life expectancy in the Long-Term Investment Strategy.

Understand the potential for asset obsolescence.

Undertake ongoing analysis and validation of the EHI information used.

To ensure the overall effectiveness of our models, our forecasting methodology and the improvements we are applying to it we will develop a series of 'effectiveness measures'. These measures will cover two elements, how effective is the methodology at projecting ahead and how effective are our actions in getting the most value out of the assets.

4.7 Accuracy & reliability

The EHI scores have been graded as C5 (extrapolation from limited data with an accuracy range of 25-50%). This assessment is based current data availability and the methodology used (Basic). As we continue to validate data points such as date of install and condition, the confidence scores will be revised. There is a lack of date of installation for sludge treatment held in the corporate system and so a confidence grade of M has been assigned. This will be a focus of the data improvement to SR27.

5 Block B - Current asset health - 'Asset health as at 31 March 2025'

For the modelled asset assessment of EHI we grouped the asset categories by sub asset category with the relevant line numbers being grouped into either Civil, MEICA or Water infra. The reason for this is the groupings have similar lives and replacement rates once we move from asset age to condition deterioration rates. Table 10 showed the line number by grouping.

Table 10 Line numbers grouped by sub-asset category grouping

Civil		MEICA		Water Infra	
3b.1	Ground Water Sources	**3b.2**	Ground Water Sources	**3b.11**	Water Trunk Mains (excl. Asbestos Cement)
3b.3	Raw Water Pumping	**3b.4**	Raw Water Pumping	**3b.12**	Water Trunk Mains (Asbestos Cement)
3b.5	Water Treatment Works	**3b.6**	Water Treatment Works	**3b.13**	Water Distribution Mains (excl. Asbestos Cement)
3b.7	Treated Water Pumping	**3b.8**	Treated Water Pumping	**3b.14**	Water Distribution Mains (Asbestos Cement)
3b.9	Treated Water Storage	**3b.10**	Treated Water Storage		
3b.15	Sewage Pumping Stations	**3b.16**	Sewage Pumping Stations		
3b.17	Sewage Treatment Works	**3b.18**	Sewage Treatment Works		
3b.19	Sludge Treatment Centres	**3b.20**	Sludge Treatment Centres		

EHI scores have been calculated using the methodology described in Section 4.

5.1 Example commentary for discussion

Some examples are provided of general observations of EHI (based on asset age and an infill methodology) and we would welcome a conversation on what would be most relevant or helpful in this section for the FBP.

Two example graphs have been provided per function area to help with the assessment of the DBP Table 3b EHI information. In this section looks at the Spread of EHI bands (% number of assets in that function) across each function and then the second graph shows the EHI band spread of assets (as a %) within each function. This section focuses on the current asset stock EHI and Section 7 looks at the EHI band out to 2051.

Table 11 Block A: Asset Health at 31st March 2025 columns 1-5 sample commentary

<table>
<tr><th colspan="3">Block A Asset Health at 31st March 2025 Columns 1-5 Sample commentary</th></tr>
<tr>
<td>Water Civil assets
By asset band
Line ref

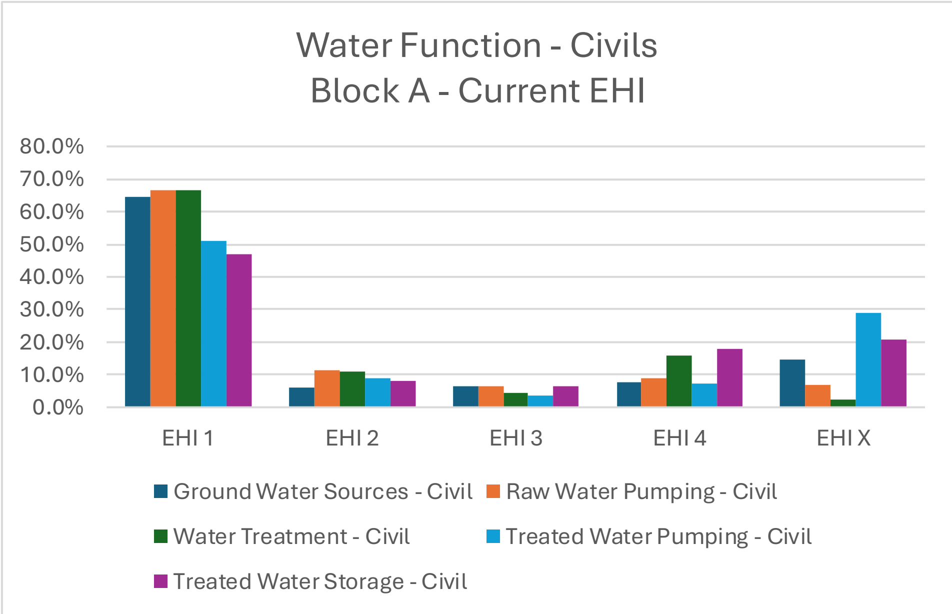
3b.1,
3b.3,
3b.5.
3b.7,
3b.9</td>
<td>

Figure 3 Water assets – Civils – Current EHI profile</td>
<td>Summary by EHI band
Based on age or an infill age where it was not available, the majority of assets (72%) are within EHI Band EHI1-3. This however does not take account of the physical condition of the asset.

15% of assets sit in EHI4 and a further 13% in EHIX

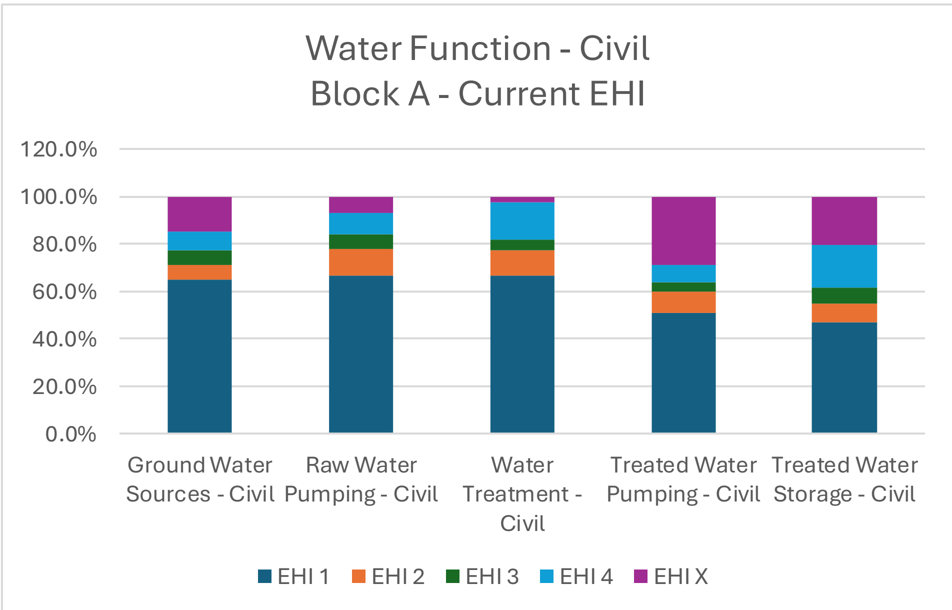
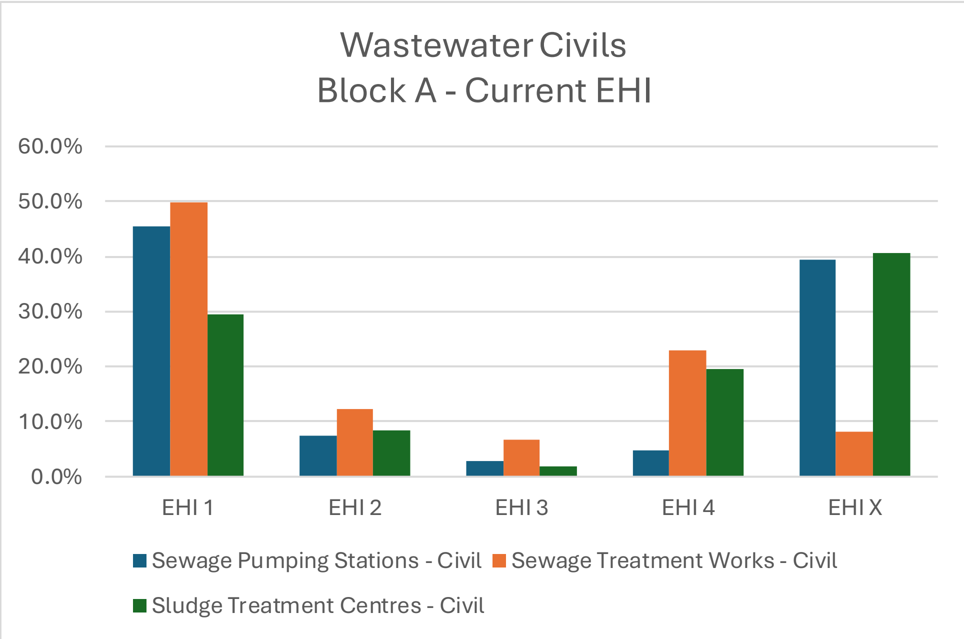
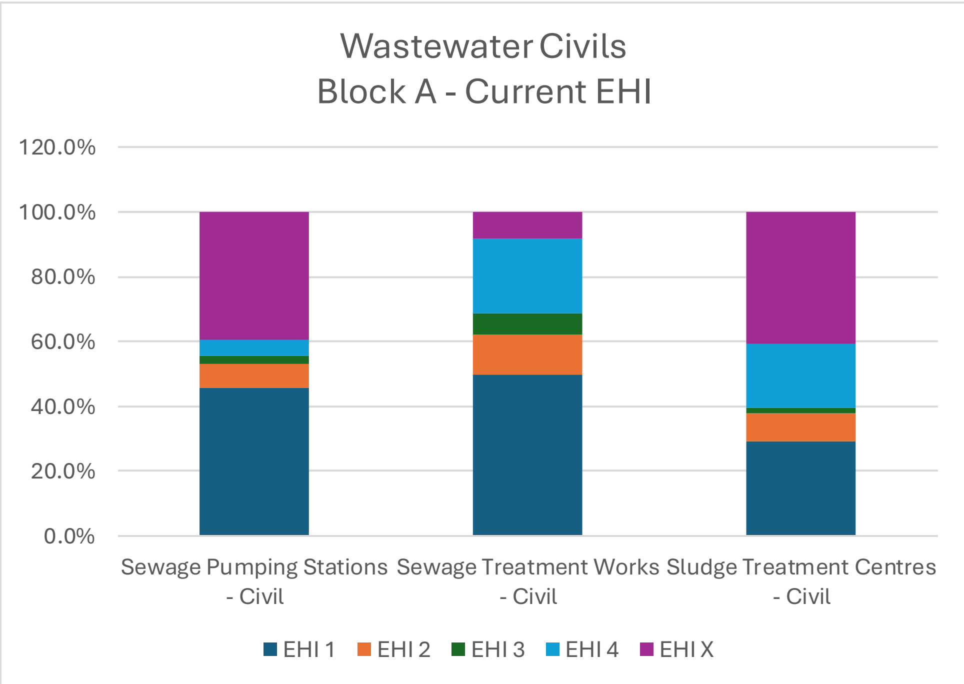
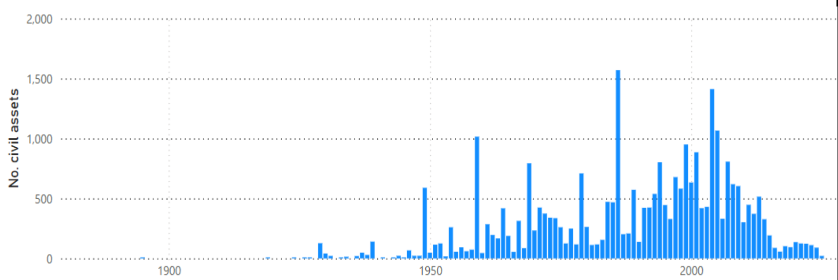
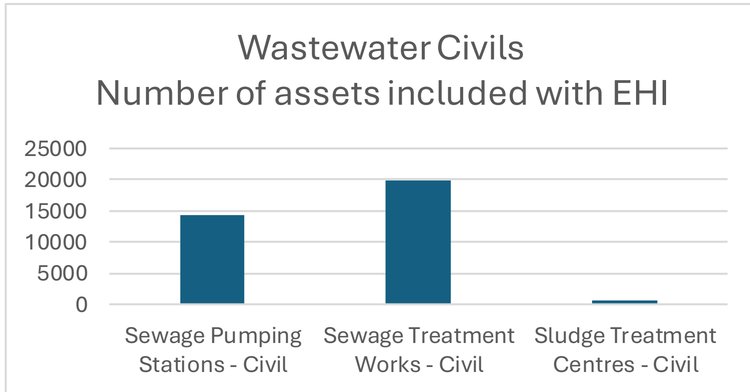
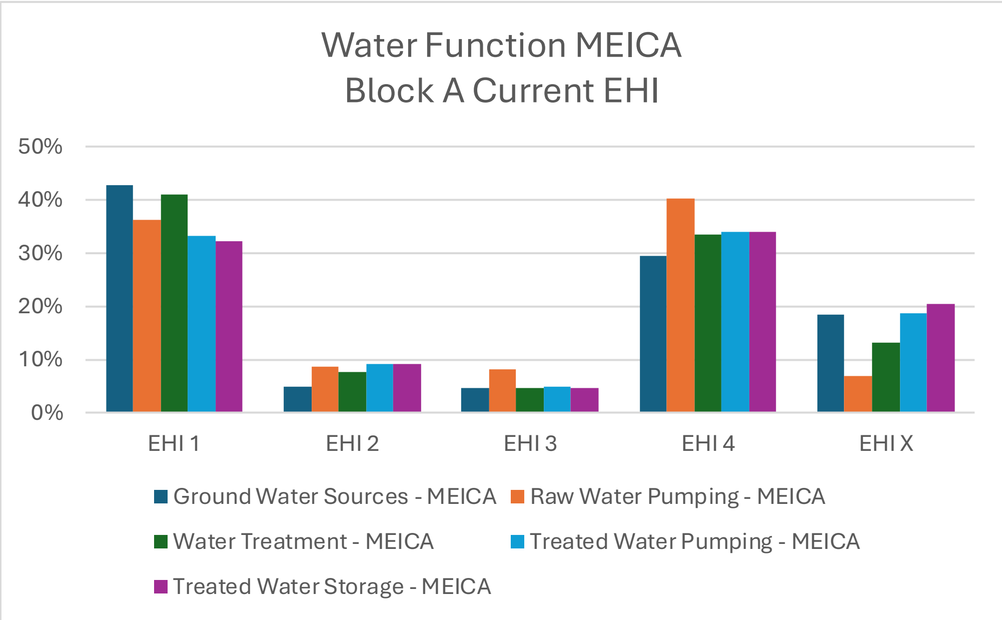
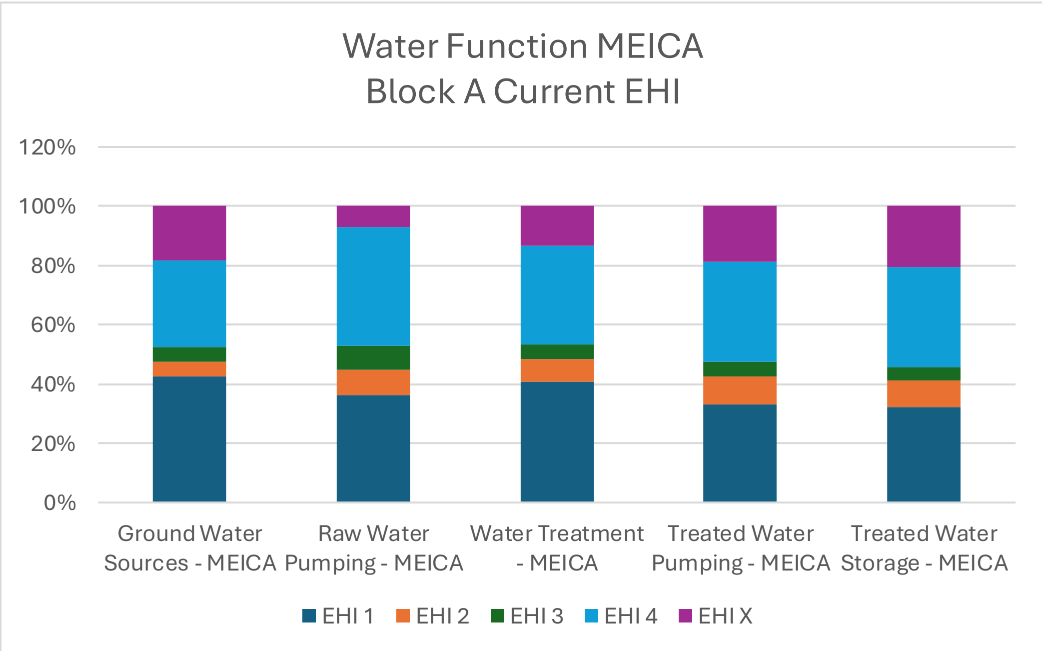
It is noted that all civil assets are currently included irrespective of if they impact the service to customers (ie includes roads, fences, as well as personal structures that house process and control equipment). A review of primary and secondary assets will be included in the proposed improvements to 2027.</td>
</tr>
<tr>
<td>Water Civil assets
By function</td>
<td>

Figure 4 Water assets – Civils – Current Function profile</td>
<td>Summary by Function
As an example of commentary

Line 3b.1
The Ground Water Source (GWS) function type is primarily made up of pumps (27%) MEICA , buildings (23%) CIVILS, wells (17%) CIVILS, and power supply assets (15%) MEICA, (12% other civils). Current – 77% of the assets in this function are currently EHI1-3 based on age and installation date only. As an example, all buildings are in EHI 1 given the long expected life and the current age of the buildings.

Line 3b.9
Treated water storage (average expected age 69yrs) shows the least % number of assets in EHI1-3. It is anticipated that post repair condition inspections will improve this as there is investment underway and planned in SR27 This will then be included in the EHI assessment to update the bands.</td>
</tr>
</table>

Block A Asset Health at 31st March 2025 Columns 1-5 Sample commentary		
Wastewater Civils Line ref 3b.15 3b.17 3b.19	 *Figure 5 Wastewater assets – Civils – Current EHI profile*	**Summary by EHI band** Based on age or an infill age where it was not available, most of the wastewater civil assets 63% are within EHI1-3. There are 22% of total assets in EHIX. This is being assessed as to how to improve the information. (Primarily pumping stations and sludge treatment centres as a proportion of the assets in that category.)
	 *Figure 6 Wastewater assets – Civils – Current Function profile*	**Summary by Function** Example of the data that is used that supports EHI **Age profile of Wastewater Civil assets**  *Figure 7 Age profile of asset based used in EHI calculation* **Number of Assets in each category**  *Figure 8 Number (units) of assets based used in EHI calculation*

Block A Asset Health at 31st March 2025 Columns 1-5 Sample commentary		
Line ref 3b.2 3b.4 3b.6 3b.8 3b.10	 *Figure 9 Water assets – MEICA – Current EHI profile*	**Summary by EHI Band** 51% of assets using the EHI basic methodology (average age and date of install) are in the EHI1-3 band. The SR27 capability improvement plan seeks to improve the data quality to get a more representative assessment. Introducing a requirement to hold the material type the civil structure is made of will help improve the expected age (i.e. Steel tanks will last less time that concrete). Including the condition of the structure will help to assess and reset the remaining life. This will then help our understanding of how repairs to civil structures could benefit the asset remining life.
	 *Figure 10 Water assets – MEICA – Current Function profile*	**Summary by Function** The split of EHI 4 (34% of assets) is equivalent across all the assets. We are assessing what data and process improvements can be made to provide an improved band profile. The asset data for MEICA will require more work to assess the impact of missing dates and infill methodologies on EHI4 and EHIX.

Block A Asset Health at 31st March 2025 Columns 1-5 Sample commentary

Line Ref
3b.16
3b.18
3b.20

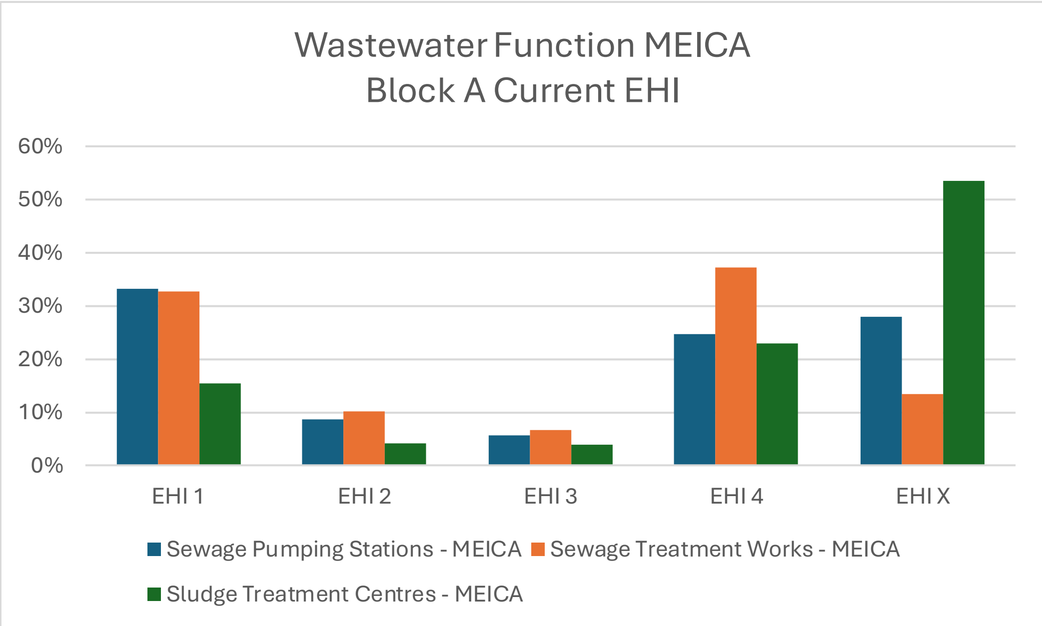


Figure 11 Wastewater assets – MEICA – Current EHI profile

Summary by EHI Band

In the Wastewater function 47% of assets fall into the EHI1 – 3 band based on average asset of that asset and its date of install only.

As with the Water MEICA the SR27 capability improvement plan seeks to improve the data quality including from the introduction of Maximo and GIS will improve the data of install. Overlaying work orders to give an indication of condition (more repairs would indicate poorer condition) will also help provide a more representative profile.

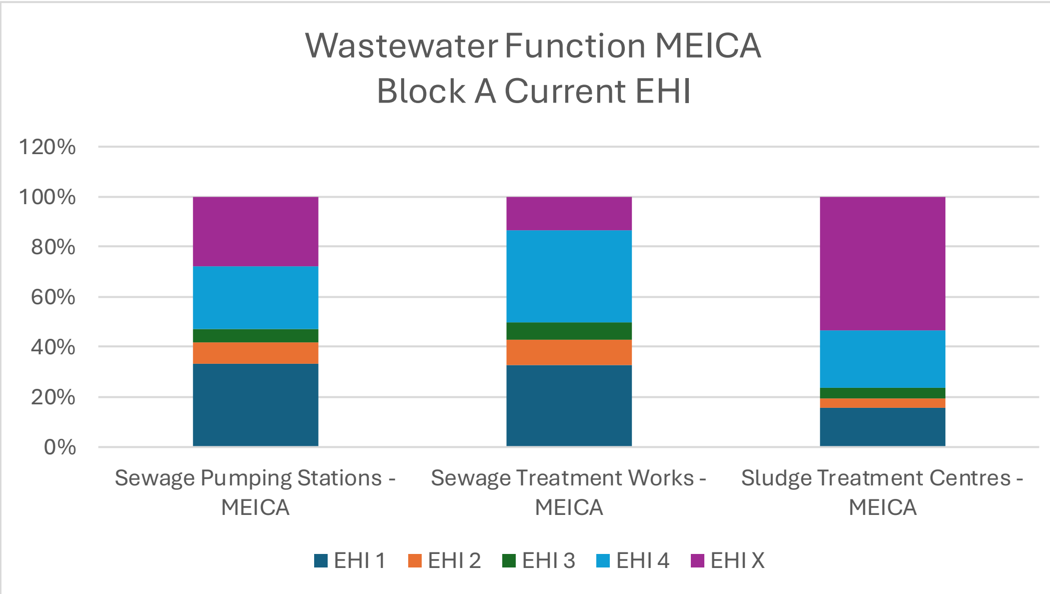


Figure 12 Wastewater assets – MEICA – Current Function profile

Summary by Function

Wastewater Asset (MEICA) Age profile)

Age profile

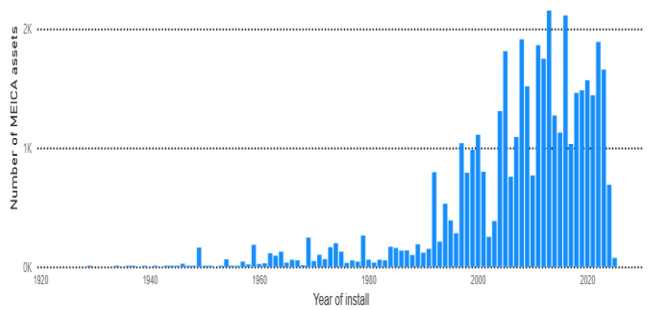


Figure 13 Age profile of asset based used in EHI calculation

Number of Assets in each category

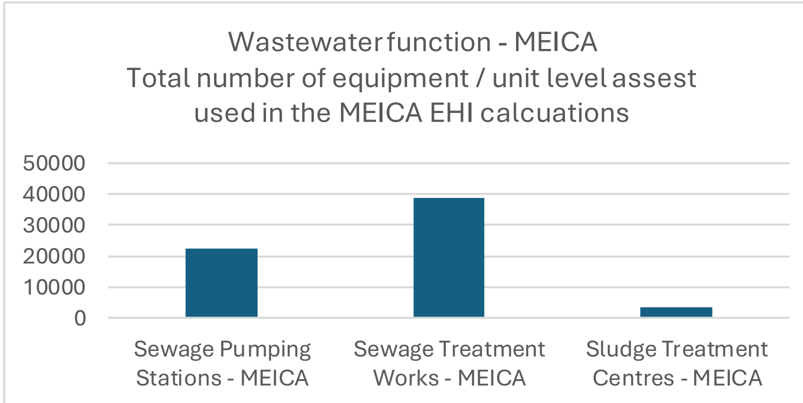


Figure 14 There are significantly more assets in MECIA that Civil used in the EHI calculations.

Note:

The EHI % scores presented in the above tables and in DBP Table 3b are based only on the date of when that asset was installed and an expected age for that asset category. Discrete expected lives have not been applied (as in the raw water example) and the condition of the asset that may adject the remaining life is not included in the EHI calculation. The work to progress this EHI scope methodology will progress in SR21 and focus on 10 Management approach areas. The remaining asset categories will be addressed in SR27.

6 Block B – SR27 and long-term maintenance expenditure

6.1 Long Term Investment Profiling Summary

The following section describes the investment forecasting methodology for asset repair / refurbish and replacement. The long-term projections (LTIS) run from 2027/28 to 2050/51 covering 4 investment periods of 6 years. These investments are the expenditure required to deliver the interventions that result in the EHI % forecast.

The below Table 12 summarises the long-term investment projection breakdown of £26bn presented in DPB Table 3b.

Table 12 Long Term Investment Profiling over 4 periods (columns 15,16,17)

Sub-outcome	Category 1 (very long life)	Category 2 (CIVIL, MEICA, Water infra)	Category 3 (Support services)
Asset repair and refurbish	£2.4 bn	£9.2 bn	£0 bn
Asset replacement	£0 bn	£10.7 bn	£0 bn
Returned assets from PFI contracts	£0 bn	£1.6 bn	£0 bn
Support services	£0 bn	£0 bn	£2.1 bn
Sub Total:.	£2.4bn	£21.5bn	£2.1bn
Total	**£26bn**		

The June 2024 long-term investment profile initially used an unconstrained Level 1 asset replacement model. The revised profile in DBP Table 3b is now based on the SR27 AR3 maintenance investment from DPB Table 3a. Using the SR27 value, the remaining LTIS investment is distributed over three periods (SR33, SR39, SR45) using a constrained asset replacement model. The total £26bn AR3 investment is scheduled for delivery between 2027 and 2051.

Several methods have been used to re-profile SR33,39,45 based on what has been included within SR27 draft plan.

- Method 1: where the SR27 investment is higher than the original LTIS profile the LTIS value has been aligned with the SR27 number, and the residual investment has been profiled reducing down from SR33 to SR45
- Method 2 where the SR27 investment is lower than the original LTIS profile the LTIS value has been aligned with the SR27 number, and the residual investment has been profiled increasing from SR33 to SR45
- Method 3 where the SR27 investment is approximately the same as the original LTIS profile the LTIS value has been aligned with the SR27 number and the original LTIS investment has been used for SR33 to SR45

6.2 Definitions

To support long-term asset planning and investment forecasting the Scottish Water asset base is considered in three categories and several subcategories, which are based on life expectancy and asset age (shown in Figure 15).

Category 1	Category 2	Category 3
• Very long-Life assets (150+ year expected life). • These are assets with particularly long lifetimes (significantly more than 100 years) for which we assume that they will be repaired and refurbished in perpetuity. • As a result, assets in this category require no asset replacement. (Sewers, Dams, Aqueducts & tunnels).	• Short to Long life assets (50 to 120 years expected life). • These are assets such as treatment works process, structures, and water networks. • These have finite expected life and, therefore, once the economic level of repaired and refurbished is reached they are replaced	• Support Services, this includes business services (i.e., non-water or wastewater) assets such as offices, digital and logistics. • These assets have different finite lives and replacement cycles.

Figure 15 Lifespan Categories

Category 1 – Very long-Life assets (150+ year expected life). These are assets with particularly long lifetimes (significantly more than 100 years) for which we assume that they will be repaired and refurbished in perpetuity. As a result, assets in this category require no asset replacement. (Sewers, Dams, Aqueducts & tunnels).

Category 2 – Short to Long life assets (5 to 120 years expected life). These are assets such as treatment works process, structures, and water networks. These have finite expected life and, therefore, once the economic level of repaired and refurbished is reached they are replaced.

Category 3 – Support Services, this includes business services (i.e., non-water or wastewater) assets such as offices, digital and logistics. These assets have different finite lives and replacement cycles.

The Table 13 below describes the intervention options considered across our asset portfolio

Table 13 Definitions used for asset repair, refurbish replacement.

Intervention Type	Definition
Tier 1 Operational costs	
Maintain[3]	The purpose is to ensure the asset can perform. This includes operation, calibration, competing task schedules (greasing, changing fan belts, electrical and physical safety checks), cleaning etc. All maintenance activities are conducted to minimise disruptions and maintain the reliability of their services
Tier 2 Capital costs	
Repair	Fixing an asset to ensure it can continue to operate and achieve its expected operational asset life. (this includes replacement of component parts) to achieve its original life.
Refurbish	Renovation/overhaul of older or damaged equipment or replacement of parts within a piece of equipment to bring the asset back to a workable condition to extend the expected life of the asset. (this includes replacement of component parts)
Replace	Replacement of an asset whether that be equipment, or whole process/site or section of infrastructure (note replacement of parts within an equipment level asset will be classified as refurbishment or repair). Replacement occurs when an asset is at the end of serviceable life, or the asset has failed and can't be repaired/refurbished (or is not economic to do so) or when a change in performance or capacity is required. Replacement of significant lengths of network pipes, >9 meters, should be considered as a replacement.
Enhance	Replacement of or addition to an existing asset which provides increased capacity, capability, or functionality.
Investigations	Activities focused on gathering asset information which is required in the decision-making process prior to an asset intervention.

6.3 Forecasting asset replacement – Category 2

Replacement forecasting methodology covers the Category 2 assets. This methodology predominantly assesses the asset type and categories to quantify how many operational assets there are, their installation / go live date, current age and future replacement rates based on an average expected life. The average asset life is calculated for the given type based on modelled data or other inputs such as external benchmarking. The assessment accounts for variables such as unknown installation date and outliers in life expectancy to allow for flexibility where needed. These numbers, asset quantity and average asset life form the foundation for the forecasting model input.

Assets are grouped into Civil (long life), Mechanical, electrical and instrumentation / control (MEICA) (very short, short and medium life) and water infrastructure (Asbestos cement and non-

[3] The investment in "maintain" is held in Tier 1 and is excluded from DBP table 3b

asbestos cement pipes). The analysis uses a Dynamic Model (Level 1) methodology: forecast of asset replacement demand.

The replacement costs for these Category 2 assets are derived from the Modern Equivalent Asset Value (MEAV). MEAV is a valuation method used to estimate the cost of replacing an existing asset with a modern equivalent, considering current technology and standards. The MEAV is calculated by assessing the current replacement cost of an asset, adjusted for depreciation and obsolescence. This involves evaluating the cost of constructing a new asset with the same functionality as the existing one, using modern materials and methods.

The Asset Replacement Demand Model takes these numbers and provides a view on replacement rates. The model shows which assets should be replaced based on an average age threshold, this is then translated into a replacement rate, per year over the next 25 years. As identified previously this rate is anticipated to be higher than usual for some asset types as more assets are reaching the end of their life at the same time.

A dynamic (annual) view of asset replacement was derived to cover the majority of our above and below ground assets. Figure 16 provides a high-level view of the process followed.

To ensure the method is robust and data is representative, review is undertaken to validate the output. As the assets, or asset systems are generally common and comparable across the industry, benchmarking is an acceptable measure. It is assumed that compatible assets have similar performance metrics and design parameters so to be assessed alongside one another is acceptable.

This validation informs whether the average age is comparable, longer or shorter than others. The risk of an inaccurate forecast can be factored in influenced by unfounded optimism or pessimism is an inherent risk. For example, if an assets age is shorter on average than others then there may be an opportunity to reassess the theoretical life.

Upon satisfying all questions regarding which assets should be replaced as a matter of fact then a long-term distribution can be plotted in the form of *replacements per year*. This rate offsets the asset that will expiry and assume a replacement will perform the same function and deliver the same service as the previous asset provided. Asset costing and the replacement rate combine to give a long-term asset replacement investment forecast.

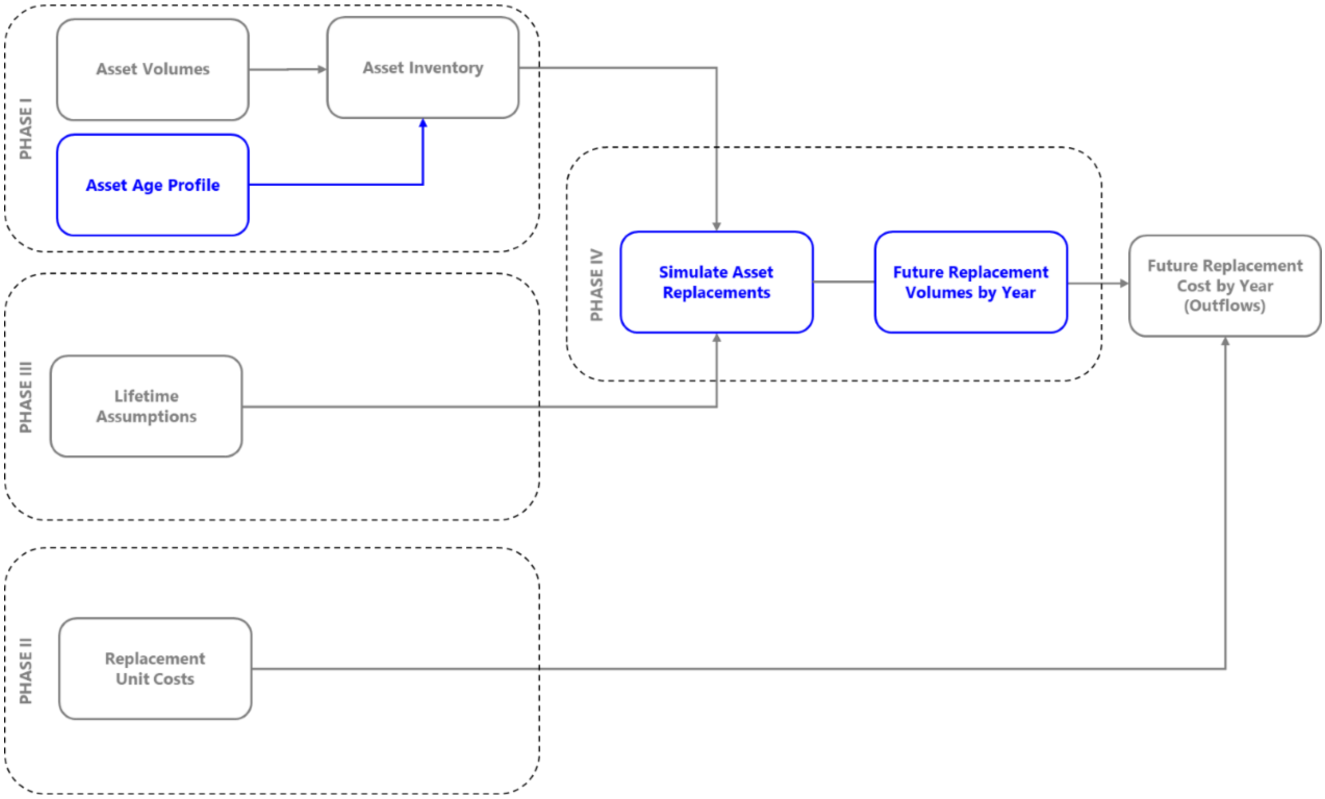


Figure 16 A dynamic (annual) View of Asset Replacement Process

The Modelled asset replacement projections are mapped directly to the Asset categories in DBP Table 3b. All asset categories 3b.1 to 3b.20 are covered. The asset replacement investment is based on LTIS position 2 described in Section 4.3.

In addition, to the asset replacement model some additional adjustments were made to the Longterm projections and included in the respective line reference. These are referenced in Table 14.

Table 14 Asset Replacement Adjustments Made

Line reference	service	Functional activity	Asset category	Sub asset category
3b.13	Water	03 Water Network	Water Distribution Main Asbestos Cement (AC Maintenance)	INFRA
3b.42	Wastewater	06 Wastewater network	Wastewater Rising Mains	INFRA

3b.13 Water mains asbestos cement. Currently the Level 1 model only projected half of the 5,500km of asbestos cement mains to be replaced in the 25-year period. It is our expectation it will all need to be replaced due to the increasing failure rates and link to repeat customer interruptions.

3b.42 Wastewater rising mains –Level 1 model does not currently pick up a forecast rising mains replacement as the asset class has not specifically assigned an expected age of replacement. A manual adjustment was made, and we will include the replacement of this asset category in a future iteration of the model.

Note We expect within the 25-year period to have to repair and replace assets that are installed to support an enhancement or growth need between 2027 and 2051. A provisional sum has been included, and further work is underway to refine this assessment. The long-term investment has been included in Lines 3b.5 (water treatment works MEICA) and Line 3b.17 (wastewater treatment works MEICA)

6.4 Forecasting asset repair and refurbishment and non-modelled asset replacement – Categories 1 and 2

This methodology covers all water and wastewater assets in Categories 1 and 2. It is collated into 17 categories to provide granularity and allow different changes to be profiled.

Repair and refurbishment forecasting utilises previous investment data for a given asset type or classification. Typically, investment is attributed to a single or group of asset management approaches. This methodology uses the historic reference points from 2021 onwards and what future trends out to 2051 are expected.

The next step analysed replacements, repairs, refurbishment, inspections investment trends. Methodical evaluation of the data looked for trends in how, why and where money was spent. The purpose of this is to build a forward view of investment needs based on previous success. For example, a trend that shows assets are increasingly being replaced due to new legislation may not persist beyond the short term so forecasting needs to account for this. Equally, rising repair trends may mean that technology has developed to such a point that what would previously mandate replacement is now repairable. Also, methods of pre-failure detection are advancing so to reduce failures means increasing repairs. The methodology accounts for previous spending trends to inform rationale for future projections.

Step 3 was to collect an informed view from assets managers, operators and asset management owners to understand what decisions, targets and influencing factors were present in previous planning periods and what was expected in future periods. By adding this layer of information, the investment profiles were sense checked against the rationale at that point in time. This is hugely valuable as a validation as it sets the future challenges in context. It does this by capturing “real world” demands and issues that do not always translate in to current demand. Understanding what is required of an asset type over 25 years is paramount for well-founded projections from which to base investment cost. More work is identified in this area to improve our confidence in the projections.

Asset repair and refurbishment activities may be driven by more than internal asset health related parameters. External factors such as legislation changes may influence asset standards directly or indirectly. As well, there are other factors such as obsolescence, skills and material availability. There is also a significant consideration as to the effects of climate change and what that could do to assets. As these issues are considered as part of a future methodology, the resulting actions are likely to increase costs and the risks they present. Horizon scanning for major shifts or competing needs is a fundamental check for valid projections. These are then documented and reflected in the forecasting costs and investment projections. In doing so, the approach captures as much of the future variability to present a realistic projection.

The methodology for collating the asset repair / refurbishment information was developed before the business plan categories were agreed. This has meant the Asset repair/refurbish investment across the asset categories for modelled, non-modelled and infinite life has had to be assessed manually where there was not a 100% match. A method was developed to allow investment to be disaggregated across the asset categories and the % distribution across each asset category are shown in the table below.

Table 15 shows how the long-term asset repair/refurbishment investment has been apportioned to the DPB Table 3b asset categories.

Table 15 Long-term asset repair/refurbishment investment assigned to the DBP Table 3b asset categories

Asset repair / refurbish category	Primary functional activity	Primary asset category	%	Line	Secondary asset category	%	Line	Third Asset category	%	Line	Forth Asset category	%	Line
RR03 Reservoir Maintenance	01 Source	Infinite-Life Assets Dams and impounding reservoirs	100	3b.22									
RR04 Water Main Bursts	01 Source	Infinite-Life Assets Raw water intakes (gravity)	100	3b.26									
RR06 Service Reservoir (Raw Water Storage)	01 Source	Infinite-Life Assets Raw water storage (civils)	100	3b.24									
RR15 Aqueducts	01 Source	Infinite-Life Assets Aqueducts	100	3b.25									
RR15 Tunnels	01 Source	Infinite-Life Assets Aqueducts	100	3b.25									
RR02 Civil Repairs - Water	02 Water Treatment	Water Treatment Works Civil	85	3b.5	Treated Water Storage_Civil	10	3b.9	Ground Water Sources_Civil	4	3b.1	Raw Water Pumping_Civil	1	3b.3
RR01 MEICA - Water (Quality)	02 Water Treatment	Water Treatment Works MEICA	100	3b.6									
RR01 MEICA - Water (Continuity)	02 Water Treatment	Water Treatment Works MEICA	75	3b.6	Treated Water Pumping MEICA	20	3b.8	Ground Water Sources_MEICA	4	3b.2	Raw Water Pumping_MEICA	1	3b.4
RR09 Filter Media Replacement	02 Water Treatment	Water Treatment Works MEICA	100	3b.6									
RR12 Statutory Maintenance - Water	02 Water Treatment	Water Treatment Works MEICA	50	3b.6	Treated Water Pumping MEICA	50	3b.8						
RR06 Service Reservoir (Treated Water Storage)	03 Water Network	Treated Water Storage_Civil	100	3b.9									
RR11 Trunk / Distribution Cleaning	03 Water Network	Water Distribution Mains (exc. Asbestos Cement)	80	3b.13	Water Trunk Mains (exc. Asbestos Cement)	20	3b.11						
RR04 Water Main Bursts	03 Water Network	Water Trunk Mains (exc. Asbestos Cement)	67	3b.11	Raw Water Mains Total	33	3b.33						
RR04 Water Main Bursts	03 Water Network	Water Distribution Mains (exc. Asbestos Cement)	90	3b.13	Water Distribution Mains (Asbestos Cement)	10	3b.14						
RR07 Ironworks & Manholes (Water)	03 Water Network	Water Mains Ancillaries	100	3b.37									
RR08 Leakage	03 Water Network	Water Mains Ancillaries	100	3b.37									
RR13 Water Pipe Bridges	03 Water Network	Water Mains Ancillaries	100	3b.37									
RR05 Sewer Collapse	06 Wastewater network	Infinite-Life Assets (Combined)_Other	100	3b.28									
RR07 Ironworks & Manholes (Wastewater)	06 Wastewater network	Other Sewage Structures (Combined)_Total	100	3b.47									
RR10 Sewer Cleaning (Storm Storage Cleaning)	06 Wastewater network	Infinite-Life Assets (Combined)_Other	50	3b.28	Surface Water Storage and Treatment (Nature-based)_SUDS	25	3b.56	Other Sewage Structures (Combined)_Total	25	3b.55			
RR13 Wastewater Pipe Bridges	06 Wastewater network	Other Sewage Structures (Combined)_Total	100	3b.47									
RR14 Sewer Structure Cleaning and Maintenance	06 Wastewater network	Other Sewage Structures (Combined)_Total	100	3b.47									
RR16 PFI (Infra)	06 Wastewater network	Infinite-Life Assets (Combined)_Other	100	3b.41									
Wastewater Rising Mains	06 Wastewater network	Pumped Combined Rising Mains Total	100	3b.42									
RR02 Civil Repairs - Wastewater	07 Wastewater treatment	Sewage Treatment Works Civil	60	3b.17	Sewage Pumping Stations Civil	20	3b.15	Outfalls From Treatment (Combined)_Total	12	3b.48	Combined Sewer Overflow_Screened	8	3b.45
RR16 PFI (CIVILS)	07 Wastewater treatment	Sewage Treatment Works Civil	50	3b.17	Sludge Treatment Centres Civil	50	3b.19						

Asset repair / refurbish category	Primary functional activity	Primary asset category	%	Line	Secondary asset category	%	Line	Third Asset category	%	Line	Forth Asset category	%	Line
RR01 MEICA - Wastewater	07 Wastewater treatment	Sewage Treatment Works MEICA	70	3b.18	Sewage Pumping Stations MEICA	30	3b.16						
RR12 Statutory Maintenance - Wastewater	07 Wastewater treatment	Sewage Treatment Works MEICA	50	3b.18	Sewage Pumping Stations MEICA	50	3b.16						
RR16 PFI (MEICA)[4]	07 Wastewater treatment	Sewage Treatment Works MEICA	50	3b.18	Sludge Treatment Centres MEICA	50	3b20						
RR17 property and access Water	support services	Water Treatment Works_Civil	100	3b.5									
RR17 property and access Wastewater	support services	Sewage Treatment Works_Civil	100	3b.17									

[4] RR016 makes a provision for Assets inherited from completion of PFI contracts

6.5 Assets inherited from PFI contracts methodology

In addition to the projected investment requirements on the existing asset base further investment is required to support the asset base that Scottish Water will inherit as PFI contracts end. By 2027 Scottish Water will have 7 remaining contracts, that include 14 Wastewater Treatment works, 6 sludge treatment centres, 168km of network and 51 pumping stations. These contracts will predominantly expire by 2040 and the assets are assumed to be transferred to Scottish Water to maintain and operate. Much of the MEICA equipment on these sites is expected to be life expired and will require investment in order to maintain current service levels, except civils which may have many more years of life left remaining.

The current LTIS projection of AR3 investment is based on the historic experience at the transfer of previous PFI schemes and an initial assessment of asset condition. Note the replacement of Daldowie Sludge treatment centre is included within the Bio Recourse sub outcome (table 2).

6.6 Impact of new assets to address improvements or reducing risk to service (enhancement)

An allowance has been made to allow for the repair / replacement of new assets that are installed from SR27 that address enhancement or growth needs that are currently not in the asset register. Over the 25yrs it is only expected to cover the short life assets.

6.7 Support Services methodology

The Support Services allocation (Approximately 7% of the overall LTIS AR3 projections) is based on the current investment run rates with an assessment of how the impact of moving to a more digital monitoring service and importance of cyber security may impact requirements over the next 25yrs. The category covers:

- 3b.64 Vehicles - Replacement of vehicle fleet
- 3b.65 Digital - (laptops, servers, new / refresh IT systems),
- 3b.66 Facilities and estates - Management of offices, depots and estates (including legal and H&S compliance)
- 3b.67 Renewable energy assets (Wind turbines, solar panels, hydro turbines)
- 3b.68 Scientific equipment
- 3b.69 Other (Future Studies / Asset Data Improvements / AR3 Emergency Response / AR3 Inspections / Maintenance of Monitors)

6.8 Assignment of LTSI Asset Repair, Refurbish, Replacement (AR3) investment to the DBP Table 3b asset categories

Table 16: Commentary on how the Long-Term Investment Columns 15,16,17 have been completed.

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Long-term planned maintenance expenditure (£m) Repair / Refurbish	Long-term planned maintenance expenditure (£m) Replacement
3b.1	3a.9	Water	Source	Ground Water Sources	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
3b.2	3a.10	Water	Source	Ground Water Sources	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
3b.3	3a.1	Water	Source	Raw Water Pumping	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
3b.4	3a.2	Water	Source	Raw Water Pumping	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
3b.5	3a.11	Water	Water Treatment	Water Treatment Works	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
3b.6	3a.12	Water	Water Treatment	Water Treatment Works	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
3b.7	3a.13	Water	Water Network	Treated Water Pumping	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
3b.8	3a.14	Water	Water Network	Treated Water Pumping	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
3b.9	3a.15	Water	Water Network	Treated Water Storage	Civil	Projection extrapolated from long term TWS repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
	3a.16	Water	Water Network	Treated Water Storage			
3b.10	3a.15	Water	Water Network	Treated Water Storage	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
	3a.16	Water	Water Network	Treated Water Storage			
3b.11	3a.17	Water	Water Network	Water Trunk Mains (excl. Asbestos Cement)	Infra	Projection extrapolated from long term water distribution mains repair	Asset Replacement projection based on Level 1 model with- 15% increase in average expected life included.
	3a.18	Water	Water Network	Water Trunk Mains (excl. Asbestos Cement)			
3b.12	3a.19	Water	Water Network	Water Trunk Mains (Asbestos Cement)	Infra	Projection extrapolated from long term water distribution mains repair	Asset Replacement projection based on Level 1 model with 0% increase in average expected life included.
3b.13	3a.20	Water	Water Network	Water Distribution Mains (excl. Asbestos Cement)	Infra	Projection extrapolated from long term water distribution mains repair	Asset Replacement projection based on Level 1 model with 15% increase in average expected life included.
	3a.21	Water	Water Network	Water Distribution Mains (excl. Asbestos Cement)			
3b.14	3a.22	Water	Water Network	Water Distribution Mains (Asbestos Cement)	Infra	Projection extrapolated from long term water distribution mains repair	Asset Replacement projection based on Level 1 model with 0% increase in average expected life included.
3b.15	3a.37	Wastewater	Wastewater Network	Sewage Pumping Stations	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
	3a.52	Wastewater	Wastewater Network	Sewage Pumping Stations			
	3a.65	Wastewater	Wastewater Network	Sewage Pumping Stations			
3b.16	3a.38	Wastewater	Wastewater Network	Sewage Pumping Stations	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
	3a.53	Wastewater	Wastewater Network	Sewage Pumping Stations			
	3a.66	Wastewater	Wastewater Network	Sewage Pumping Stations			
3b.17	3a.42	Wastewater	Wastewater Treatment	Sewage Treatment Works	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
	3a.44	Wastewater	Wastewater Treatment	Sewage Treatment Works			
	3a.57	Wastewater	Wastewater Treatment	Sewage Treatment Works			
	3a.59	Wastewater	Wastewater Treatment	Sewage Treatment Works			
3b.18	3a.43	Wastewater	Wastewater Treatment	Sewage Treatment Works	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
	3a.45	Wastewater	Wastewater Treatment	Sewage Treatment Works			
	3a.58	Wastewater	Wastewater Treatment	Sewage Treatment Works			

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Long-term planned maintenance expenditure (£m) Repair / Refurbish	Long-term planned maintenance expenditure (£m) Replacement
	3a.60	Wastewater	Wastewater Treatment	Sewage Treatment Works			
3b.19	3a.46	Wastewater	Wastewater Treatment	Sludge Treatment Centres	Civil	Projection extrapolated from long term Civil repair	Asset Replacement projection based on Level 1 model with 20% increase in average expected life included.
3b.20	3a.47	Wastewater	Wastewater Treatment	Sludge Treatment Centres	MEICA	Projection extrapolated from long term MEICA repair	Asset Replacement projection based on Level 1 model with 5% - 15% increase in average expected life included.
3b.21		**Total Modelled Assets**					
3b.22	3a.4	Water	Source	Infinite-Life Assets	Dams and impounding reservoirs	Projection has bene updated to reflect the increase flagged in SR27. The SR33,39,45 investment has bene adjusted to reflect the LTIS total value. This will be reassessed in Sept as part of the annual LTIS refresh.	No asset replacement included
3b.23	3a.5	Water	Source	Infinite-Life Assets	Dam ancillaries	The investment has not been broken out from Line 3B.22	No asset replacement currently included
3b.24	3a.6	Water	Source	Infinite-Life Assets	Raw water storage (civils)	Projection extrapolated from long term treated water storage repair	No asset replacement currently included
3b.25	3a.7	Water	Source	Infinite-Life Assets	Aqueducts	Projection includes increase in investment for maintaining tunnels	No asset replacement included
3b.26	3a.8	Water	Source	Infinite-Life Assets	Raw water intakes (gravity)	Projection extrapolated from long term Civil repair	No asset replacement currently included
3b.27	3a.40	Wastewater	Wastewater Network	Infinite-Life Assets (Combined)	Vitrified clay	All work on sewers assumed to be repairs (even manhole to manhole length).	No asset replacement included all work assumed as repair
3b.28	3a.41	Wastewater	Wastewater Network	Infinite-Life Assets (Combined)	Other	All work on sewers assumed to be repairs (even manhole to manhole length).	No asset replacement included all work assumed as repair
3b.29	3a.55	Wastewater	Wastewater Network	Infinite-Life Assets (Foul Only)	Vitrified clay	No investment called out in this category. All investment under 3b.27	No asset replacement included all work assumed as repair
3b.30	3a.56	Wastewater	Wastewater Network	Infinite-Life Assets (Foul Only)	Other	No investment called out in this category. All investment under 3b.27	No asset replacement included all work assumed as repair
3b.31	3a.68	Wastewater	Wastewater Network	Infinite-Life Assets (Surface Water Only)	*Total*	No investment called out in this category. All investment under 3b.27	No asset replacement included all work assumed as repair
3b.32		**Total Infinite-Life Assets**					
3b.33	3a.3	Water	Source	Raw Water Mains	*Total*	*Repairs currently covered under 3b.13 water mains*	No asset replacement currently included
3b.34	3a.23	Water	Water Network	Water Mains	Supply pipes	No investment called out in this category.	No asset replacement included
3b.35	3a.24	Water	Water Network	Water Mains	Communication pipes - lead	No investment called out in this category. Any lead replacement is captured in enhancement demand	No asset replacement included
3b.36	3a.25	Water	Water Network	Water Mains	Communication pipes - non-lead	No investment called out in this category.	No asset replacement included
3b.37	3a.26	Water	Water Network	Water Mains	Ancillaries	The breakdown of investment between repair and replacement needs to be reviewed as all has been allocated to repair as the replacement models do not distinguish these assets.	The breakdown of investment between repair and replacement needs to be reviewed as all has been allocated to repair as the replacement models do not distinguish these assets.
3b.38	3a.27	Water	Water Network	Water Meters	Non-industrial customer water meters	Investment not captured separately so will need to see how that can be captured and reported. Very small asset base just now.	Investment not captured separately so will need to see how that can be captured and reported. Very small asset base just now.
3b.39	3a.28	Water	Water Network	Water Meters	Industrial customer water meters	Investment captured under replacement	A manual assessment has been undertaken however with the introduction of smart meters we will need to reassess the replacement rates and unit costs.
3b.40	3a.29	Water	Water Network	Water Meters	Network water meters	Investment currently captured under Line 3b.37 water ancillaries. We will need to see how this can be separated out.	Investment currently captured under Line 3b.37 water ancillaries. We will need to see how this can be separated out.
3b.41	3a.30	Water	Water Network	Water Meters	Ancillaries	Investment currently captured under Line 3b.37 water ancillaries. We will need to see how this can be separated out.	Investment currently captured under Line 3b.37 water ancillaries. We will need to see how this can be separated out.
3b.42	3a.32	Wastewater	Wastewater Network	Pumped Combined Rising Mains	*Total*		*Projection of replacement is not currently included in Level 1 model. A manual addition has been made and will be reviewed in September post the revision of the management approach MA012. Currently based on SR27 investment replacement will be front end loaded (replacement required in early part of the 27-51 timeframe.)*
3b.43	3a.33	Wastewater	Wastewater Network	Gravity Sewers (Excluding Laterals and Private Sewers)	*Total*	*No assets in this category covered under 3b27 and 3b28*	*No assets in this category covered under 3b27 and 3b28*
3b.44	3a.34	Wastewater	Wastewater Network	Laterals and Private Sewers	*Total*	*Any investment associated with this category covered under 3b27 and 3b28*	*No assets in this category*

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Long-term planned maintenance expenditure (£m) Repair / Refurbish	Long-term planned maintenance expenditure (£m) Replacement
3b.45	3a.35	Wastewater	Wastewater Network	Combined Sewer Overflow	Screened	Repairs are currently covered under line 3b.27. Work is underway to separate these out	Investment to be assessed in next iteration of the Long Term projections
3b.46	3a.36	Wastewater	Wastewater Network	Combined Sewer Overflow	Unscreened	Repairs are currently covered under line 3b.27. Work is underway to separate these out	Investment to be assessed in next iteration of the Long Term projections
3b.47	3a.39	Wastewater	Wastewater Network	Other Sewage Structures (Combined)	*Total*		Investment to be assessed in next iteration of the Long Term projections
3b.48	3a.48	Wastewater	Wastewater Network	Outfalls From Treatment (Combined)	*Total*		Investment to be assessed in next iteration of the Long Term projections
3b.49	3a.50	Wastewater	Wastewater Network	Sewage and Sludge Pumping Mains (Foul Only)	*Total*	*No assets in this category*	*No assets in this category*
3b.50	3a.51	Wastewater	Wastewater Network	Emergency Outfalls (Foul Only)	*Total*	*No assets in this category*	*No assets in this category*
3b.51	3a.54	Wastewater	Wastewater Network	Other Sewage Structures (Foul Only)	*Total*	*No assets in this category*	*No assets in this category*
3b.52	3a.61	Wastewater	Discharge	Outfalls From Treatment (Foul Only)	*Total*	*No assets in this category*	*No assets in this category*
3b.53	3a.63	Wastewater	Wastewater Network	Sewage and Sludge Pumping Mains (Surface Water Only)	*Total*	*No assets in this category*	*No assets in this category*
3b.54	3a.64	Wastewater	Wastewater Network	Emergency Outfalls (Surface Water Only)	*Total*	No investment called out in this category. Work underway to identify in Asset register and models.	No investment called out in this category.
3b.55	3a.67	Wastewater	Wastewater Network	Other Surface Water Structures	*Total*	No investment called out in this category.	No investment called out in this category.
3b.56	3a.69	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	SUDS	Demand just emerging so will be reassessed in September 25 refresh. Currently Tier 1 operating cost (for maintaining sites – grass cutting, material removal, fencing)	No investment called out in this category.
3b.57	3a.70	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Wetlands	No investment called out in this category.	No investment called out in this category.
3b.58	3a.71	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Reed beds	No investment called out in this category.	No investment called out in this category.
3b.59	3a.72	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Swales	No investment called out in this category.	*No assets in this category*
3b.60	3a.73	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	Rain gardens	No investment called out in this category.	No asset replacement included
3b.61	3a.74	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Nature-based)	*Total*	No investment called out in this category.	No investment called out in this category.
3b.62	3a.75	Wastewater	Wastewater Treatment	Surface Water Storage and Treatment (Surface Water Only)	MEICA	No investment called out in this category.	No asset replacement included
3b.63	3a.76	Wastewater	Discharge	Outfalls From Treatment (Surface Water Only)	*Total*	No investment called out in this category. Work underway to identify in Asset register and models.	No investment called out in this category.
3b.64	3a.78	Water & Wastewater Shared Assets	Business Services	Support Services	Vehicles	Based on historic run rate of EV. No allowance for conversion of diesel to EV / alternative for sludge tankers	
3b.65	3a.79	Water & Wastewater Shared Assets	Business Services	Support Services	Digital	Based on historic run rate and inclusion for the increase in monitors, signal management, AI demand. (will exclude cloud based services as now Tier 1)	
3b.66	3a.80	Water & Wastewater Shared Assets	Business Services	Support Services	Facilities and estates	Based on history run rate. Allowance for 1 office replacement rest repairs	
3b.67	3a.81	Water & Wastewater Shared Assets	Business Services	Support Services	Renewable energy	Projections based on repair / replacement to maintain current generation.	

Table 3b Line reference	Mapping to DBP table 3a	Service	Functional activity	Asset category	Sub-asset category	Long-term planned maintenance expenditure (£m) Repair / Refurbish	Long-term planned maintenance expenditure (£m) Replacement
3b.68	3a.82	Water & Wastewater Shared Assets	Business Services	Support Services	Scientific services	Based on historic run rate. No allowance for additional sampling requirements / equipment.	
3b.69	3a.83	Water & Wastewater Shared Assets	Business Services	Support Services	Other	Includes, asset inspection, data improvements, emergency response equipment and maintenance of monitors not currently in asset inventory.	
3b.70		**Total Unmodelled Assets**					
x							
NEW	NEW	Water	Source	Infinite-Life Assets	Catchments	No investment currently called out but will be updated for Sept 25. Current peatland management is funded from carbon capture.	
NEW	NEW	Water	Water Treatment	Water Treatment Works	New Enhancement MEICA Replacement (Water)	Estimate of asset repair and replacement for new assets installed during the 2027-51 period not currently in the asset register. – Formular under review for final submission. Additional line for visibility.	
NEW	NEW	Wastewater	Wastewater Treatment	Sewage Treatment Works	New Enhancement MEICA Replacement (Wastewater)	Estimate of asset repair and replacement for new assets installed during the 2027-51 period not currently in the asset register. – Formular under review for final submission Additional line for visibility	

7 Block B - 'Asset health as at 31 March 2033 and 2051

EHI scores have been calculated using the methodology described in Section 4, and are the result of the investments profiled in columns 7-8 and 15-17 of DBP Table 3b.

The percentages demonstrate the March 2033 / 2051 EHI projection because of the proposed investment from Scenario A of the IPS for SR27 and the LTIS position 2 described in Section 1.

For the Final Business Plan submission these columns (9 to 13 and 18 to 22) will be updated with data from the April 25 asset base as reported in the AR25 Annual Return. The improvement plan described in the methodology is being reviewed internally and will be developed through to the start SR27 for 10 specific asset categories.

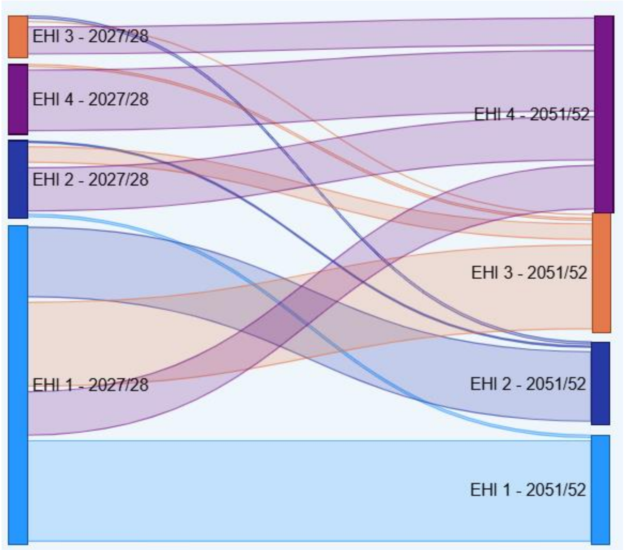
"Asset health" is reported via the Equipment health index for those assets which Scottish Water has model information on (referred to as 'modelled assets')

There are no EHI projections for the infinite life and non-modelled assets. 3b.21 to 3b.70 are not currently covered by the EHI projections.

7.1 General overview by asset category

Some examples are provided of general observations of EHI (based on asset age and an infill methodology) and we would welcome a conversation on what would be most relevant or helpful in this section for the FBP

Table 17 Example EHI observations

DBP Table 3b Line reference	Sample commentary
	The EHI (Basic) for Civil assets is projected to decline over 25 years as we focus on inspection and repair over replacement. Once condition is added to the EHI methodology it is anticipated the revised EHI will show the impact of the repairs on the remaining life of the asset. As part of the LTIS projections we are anticipating an additional 20% additional life through improved inspection and repair activities. This assumption has still to be demonstrated and built into the EHI methodology. Examples of the EHI deterioration shown in Block B are shown below. The EHI figure below shows the "shift" in EHI from Current to 2051 based on the long-term asset replacement projections (based on asset life only). While we anticipate the assets getting older our inspection and repair/ refurbish programmes should mitigate the need for full replacement of all of these assets. With the inclusion of this condition information in EHI in a future release, the impact on EHI4 should be reduced. The total number of Civil assets used in the EHI calculation is circa 50,700 split by function as shown in the figure below.  *Figure 17 change in all Civils EHI over 24yrs*

DBP Table 3b Line reference	Sample commentary

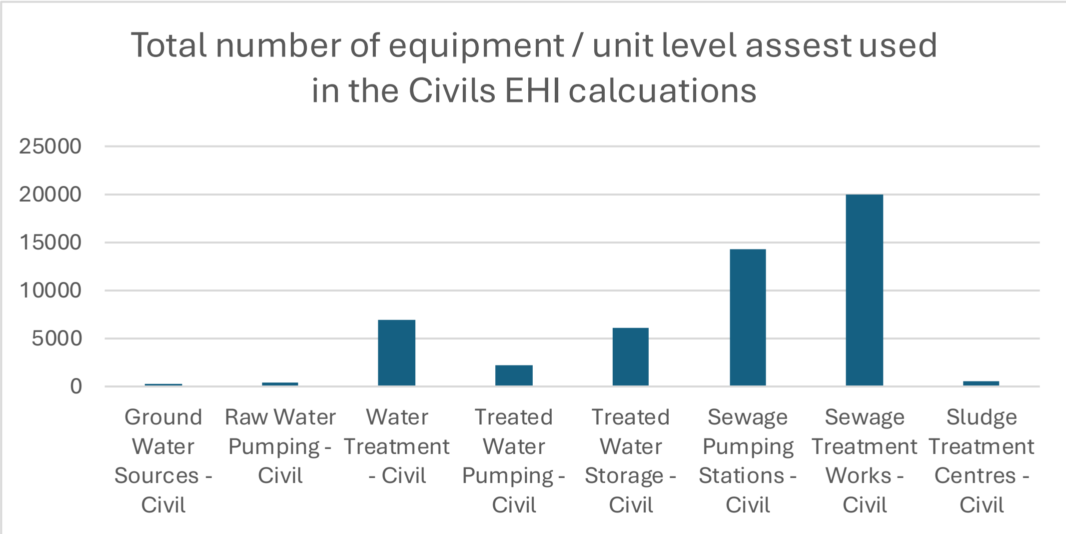


Figure 18 Current number of assets by function

Civils
3b.1
3b.5

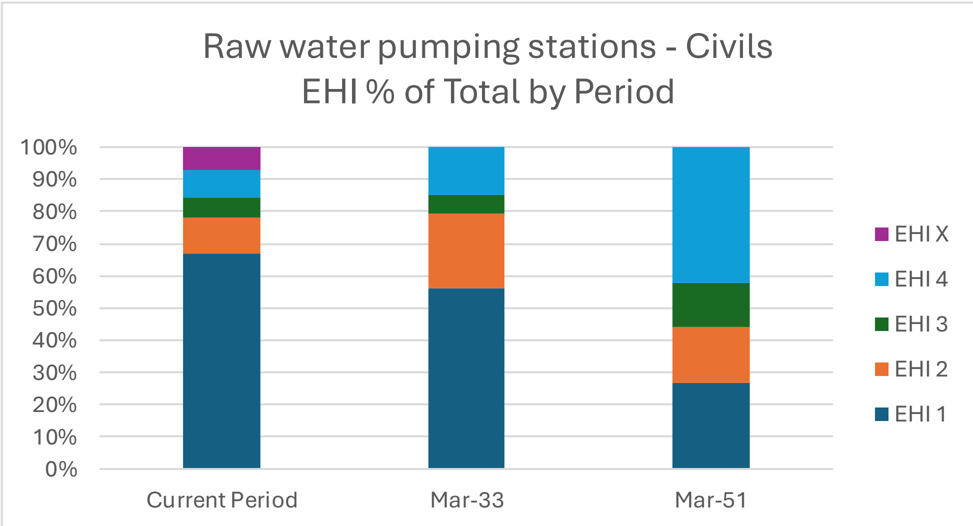


Figure 19 Raw water pumping EHI Changes 2024 - 2051

Raw water pumping 2033 - 2051 EHI Changes

Of the RWP assets that were modelled, there are 92 pumping assets (22%), 81 wells (19%), 71 buildings (17%), 59 power supply assets (14%), 39 screening assets (9%), and the remaining assets are made up of-site access roads, balancing tanks, sampling, emergency generators, wash-water systems, and road bridges.

From the chart we see a small increase in EHI 1-3 and a fairly large increase in EHI 4 from 2033 to 2051.

Increase in EHI3: The increase in EHI 3 is coming from pumping wells which moved from EHI1 or EHI2, pumping asset structures which moved from EHI 1, and sampling assets which moved from EHI 1 or EHI2.

Increase in EHI4: The larger increase in EHI4 is coming from pumping assets which moved from EHI1/EH2/EH3, screening assets previously in EHI 2/EHI3, and wells previously in EHI 2/3.

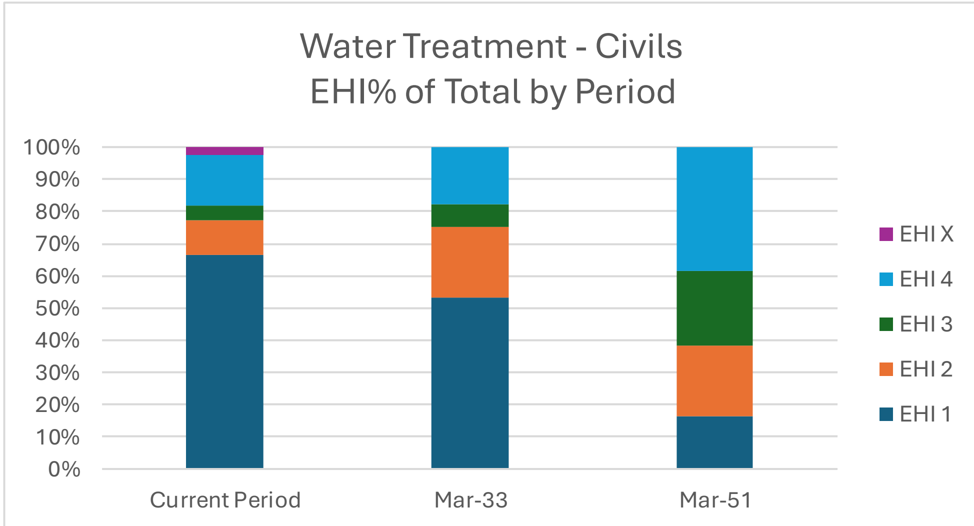


Figure 20 Water Treatment EHI Changes 2024 - 2051

Water Treatment 2033 - 2051 EHI Changes

From 2033 to 2051, we see a large decrease in EHI 1, a small decrease in EHI2 and increase across EHI 3 and EHI 4.

Increase in EHI 3: The increase in EHI 3 is mostly coming from dirty wash-water tanks which degraded from EHI 1 and EHI 2, 178 WTW inlet works (most of which were previously in EHI 2), and sampling assets previously in EHI 1/EH2. Other notable mentions are the wash-water systems, 125 contact treatment assets, and granulated media filtration assets.

Increase in EHI 4: The main 5 units that make up the EHI 4 increase we're seeing is: granulated media filtration, sludge holding tanks, 159 pumping assets, 122 polymer dosing assets, and 101 power supply assets.

Water Treatment 2051 EHI Summary

EHI1: Buildings make up just over 65% of EHI 1 in 2051 and sampling assets make up a further 15%. The remaining EHI 1 assets are made up of small amounts across multiple unit codes.

DBP Table 3b Line reference	Sample commentary	
		EHI2: The 3 unit codes that make up more than 50% of EHI 2 are sampling (SAMP) assets, WW dirty wash-water tanks (WWTX), and membrane filtration tanks, making up 25%, 15% and 14% respectively. EHI3: EHI 3 in 2051 is made up of 20% dirty wash-water tanks (WWTX), just over 10% of both WTW inlet works (INLX) and sampling (SAMP) assets. These are followed by wash-water systems (WASH), contact treatment (CNTX), and granulated media filtration (GMTX), which each make up 8% of assets. EHI4: EHI 4 doesn't have a standout unit code that makes up a large portion but, to name a few, granulated media filtration makes up just over 15%, both sludge storage tanks (SHTX) and sodium hypochlorite dosing (CWSH) make up around 10% each, and pumping assets and dirty wash-water tanks make up just over 5% each.

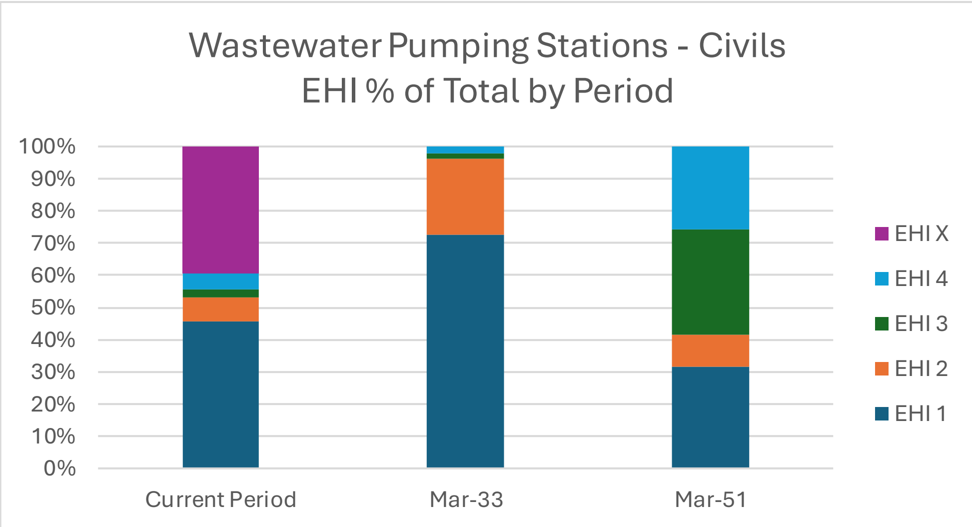


Figure 21 Wastewater pumping stations– Civils EHI Changes 2024 - 2051

2033 - 2051 EHI Changes

From 2033 to 2051, we see a large decrease in EHI, a decrease in EHI2, and a large increase in EHI 3 and EHI 4. SPS is fairly unique compared to the other function types here as the main units that make it up aren't too far through their expected life.

Increase in EHI3: The increase in EHI 3 is largely coming from WWPS wells - most of which (98%) were previously in EHI 1 in 2033). There were also 589 screening assets which moved into EHI 3 and, again, almost all of them came from EHI 1 in 2033. Other notable mentions are storm water tanks which degraded into EHI3 from 2033 to 2051.

Increase in EHI4: The increase in EHI 4 is mostly coming from power supply assets which moved into EHI 4 - most of which moved from EHI 2 in 2033. Outfalls and wells also played as part as there were outfalls and wells which moved into EHI 4.

2051 EHI Summary

EHI1: EHI1 in 2051 is made up of 68% pumps. All buildings remain within EHI 1 and they make up just under 30% of the EHI 1 assets in 2051. The remaining assets are from a mix of assets from 9 other unit codes.

EHI2: Wells make up just under 40% of EHI 2 assets in 2051, pumps make up just under 20%, and screens and washwater systems make up around 10% each.

EHI3: Wells make up just over 60% of the assets within EHI 3 in 2051. Screening assets make up a further 17% followed by power supply assets (6%), off-site access roads (6%), and storm water tanks (4%).

EHI4: Power supply assets make up just over 65% of EHI4 in 205. Outfalls and wells combined make up a further 25% of the assets in EHI 4; with outfalls (13%) (to be split out and wells (11.%).

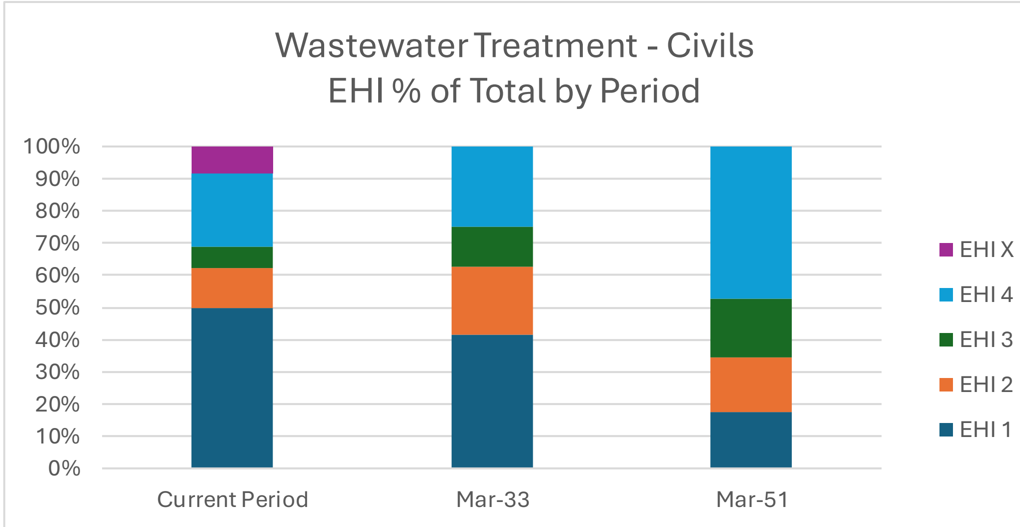


Figure 22 Wastewater treatment – Civils EHI Changes 2024 - 2051

2033 -2051 Changes

From 2033 we see a small increase in EHI 1-3 and a large increase in EHI4.

- Movements into EHI 3: From 2033 to 2051, the most notable movements into EHI 3 were the septic tanks and sedimentation tanks that were previously from EHI 2, followed by the screen structures and 218 wells that were previously EHI1 1.

- Movements into EHI 4: The most notable movements into EHI 4 from 2033 to 2051 are the structures that moved from EHI3, the screens structures that moved from EHI 2, and the site access assets that moved from EHI 3.

2051 EHI Summary

- EHI1: Building make up just over 45% of the EHI 1 assets we expect to see in 2051. We also expect pumps and balancing tanks each to make up just over 10% - with 11.1% and 10% respectively. The 2 other notable units within EHI 1 in 2051 will be sedimentation tanks (8.7%) and septic tanks (7%).

- EHI2: EHI2 in 2051 is fairly even split between many types of units. The top assets are sedimentation tanks (14.%), pump wells (9%).

- EHI3: Sedimentation tanks make up just over 20% of EHI 3 in 2051, septic tanks make up a further 18%, then screens, wells, and activated sludge make up between 5 - 10% each with 9%, 7%, and 6% respectively.

- EHI4: The top 4 unit codes that make up just over 50% of EHI4 in 2051 are outfalls (18%), wells (/ 15%), screens (10.1%), and sludge holding tanks (8.%).

DBP Table 3b Line reference	**Sample commentary**
MEICA	**Summary** The EHI (Basic) for MEICA assets is projected to improve over 25 years as most assets have an age ranging from 15 to 30 years. Once condition and performance are incorporated into the EHI methodology, it is expected that the revised EHI will reflect the impact of repairs on the remaining life of the asset. As part of the LTIS projections, we anticipate an additional 5 to 10% increase in asset life due to improved maintenance, monitoring, inspection, and repair activities. This assumption remains to be demonstrated and integrated into the EHI methodology. Given the asset replacement models for short and medium life assets are unconstrained from SR33 to SR45, it is anticipated that the EHI4 will be reduced. MEICA assets are forecasted to become significantly younger over the period. They often have relatively short, expected lives, so more assets will need to be replaced during this time compared to civil or infrastructure assets. The median expected life of assets within the MEICA dataset is 20 years (with an average of 27 years), which is shorter than the forecast period. **Notes** The level 1 asset replacement projection model excludes EHIX, contributing to differences in asset count. Additionally, the current period EHI 1-4 distribution may change if EHIX assets are included. Infill methodology appears to be a factor in the current period EHI4 peak, where unit level installation dates are used to fill missing Equipment level dates. The expected life of the Unit level asset may not accurately reflect the shorter lives of individual MEICA components. It is likely that some of these assets have been replaced within the lifespan of the Unit level asset and are therefore younger than indicated.

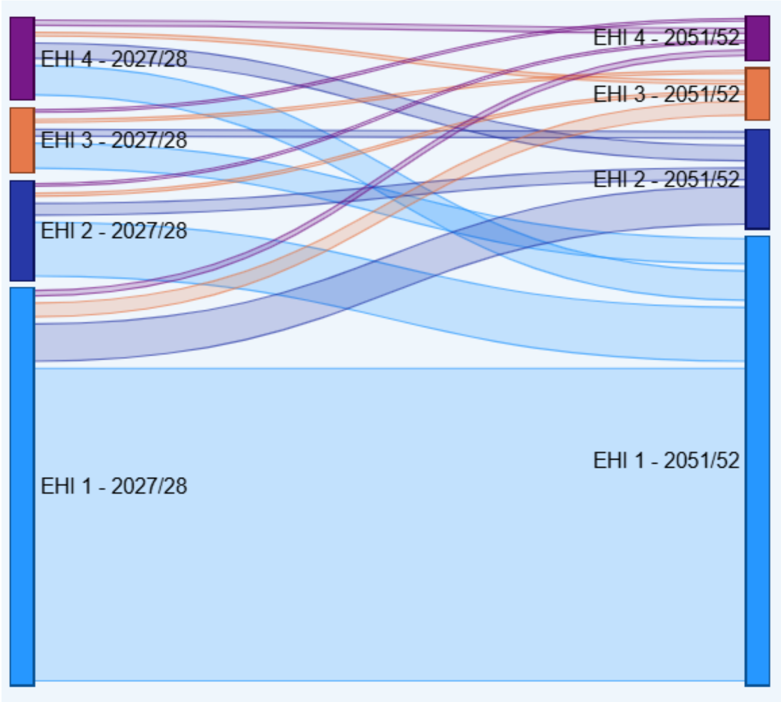


Figure 23 Change in all MEICA EHI over 24yrs

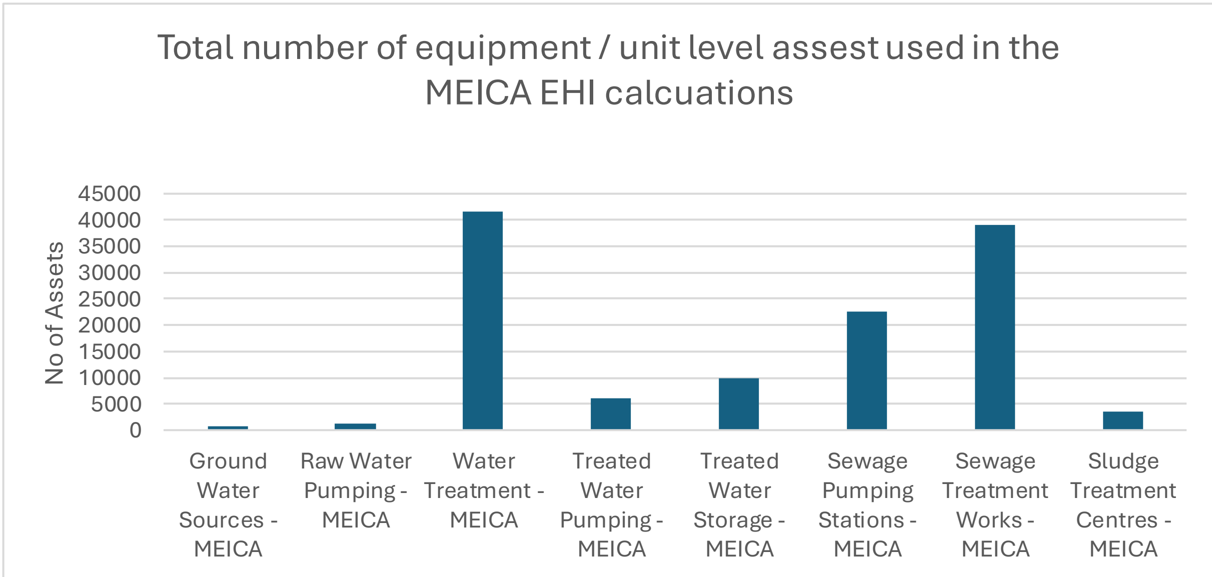


Figure 24 Current number of assets by function

<table>
<tr><th>DBP Table 3b Line reference</th><th colspan="2">Sample commentary</th></tr>
<tr><td>MEICA
3b.2 and 3b.6</td><td>

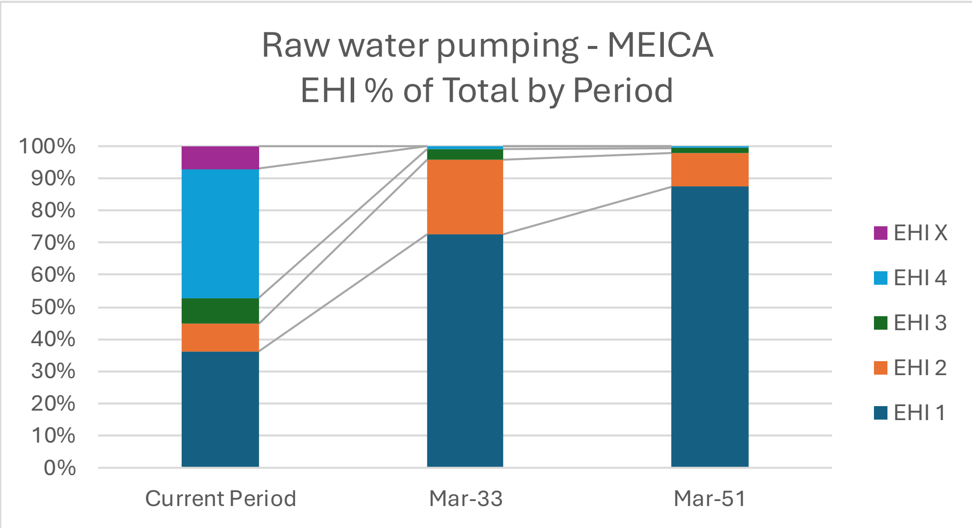


Figure 25 Raw water pumping MEICA EHI Changes 2024 - 2051

The RWS asset count is relatively small compared to some of the other MEICA categories, at 1.3k.

• Trends and EHIX/EHI4 align with other MEICA categories..

• 161 of 250 RWP assets infilled have been allocated to EHI 4, equivalent to 12% of the dataset. This will be due to the infill methodology currently looking at the higher level “unit” to provide a date of install. Adjustments to the infill approach would likely reduce this allocation.

</td><td>

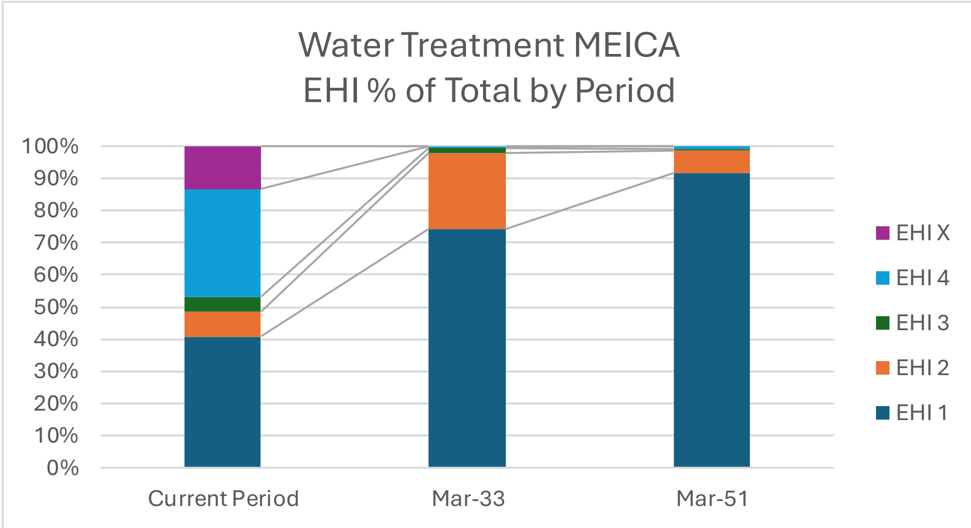


Figure 26 Water Treatment -Civils EHI Changes 2024 - 2051

• The WTW asset count is the largest across all MEICA categories, at 41k.

• Trends and EHIX/EHI4 caveats align with other MEICA categories.

• 4,190 of 6,539 WTW assets infilled have been allocated to EHI 4, equivalent to 10% of the dataset. This will be due to the infill methodology currently looking at the higher level “unit” to provide a date of install.

• We would expect to replace these assets over the 4 periods based on the LTIS replacement profiles.

</td></tr>
<tr><td>3b.16 & 3b.18</td><td>

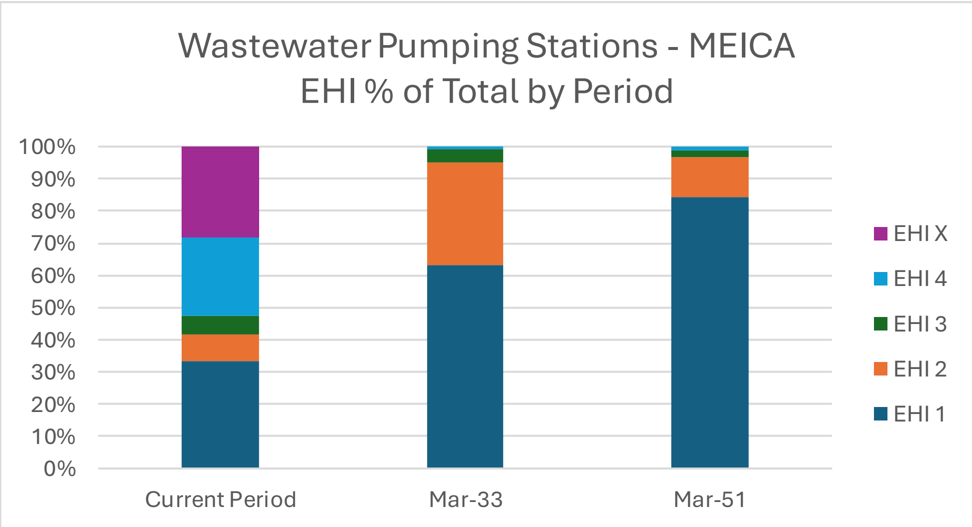


Figure 27 Wastewater Pumping Stations - MEICA EHI Changes 2024 - 2051

• Trends and EHIX/EHI4 caveats align with other MEICA categories.

• 508 of 864 SPS assets infilled have been allocated to EHI 4, equivalent to 2% of the dataset.

• Most of the change between Mar-33 and Mar-51 is between EHI1 & 2. There is limited proportional change in EHI3 & 4.

• The SPS EHIX proportional allocation is quite high compared to other MEICA categories at 28% of all assets in the Current Period dataset. Work is ongoing to improve this data set.

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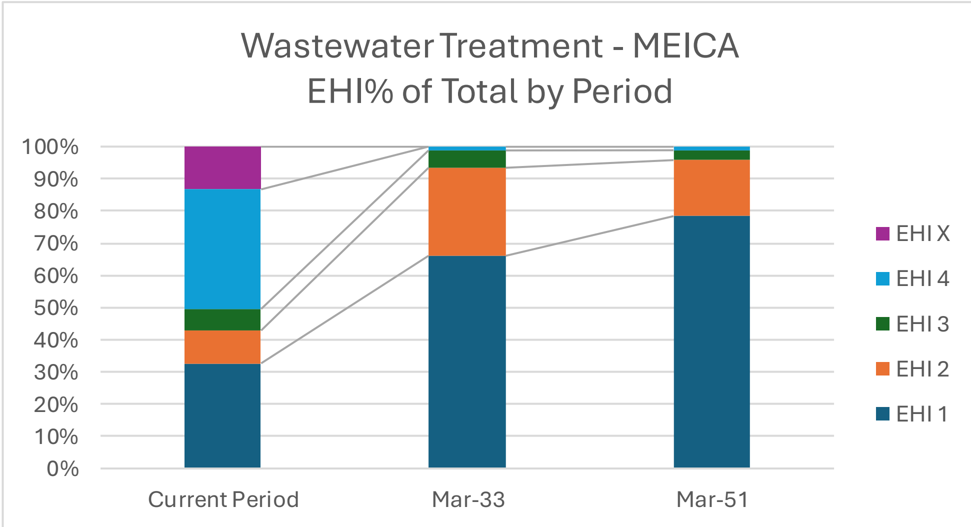


Figure 28 Wastewater Treatment – MEICA EHI Changes 2024 - 2051

The STW asset count is the 2nd largest across all MEICA categories, at 38k. • Trends and EHIX/EHI4 caveats align with other MEICA categories.

9,115 of 12,613 STW assets infilled have been allocated to EHI 4, equivalent to 2% of the dataset.

We would expect to replace these assets over the 4 periods based on the LTIS replacement profiles

</td></tr>
</table>

DBP Table 3b Line reference	Sample commentary
Water Infra 3b.13 & 3b.14	It is forecast that the EHI for water infra assets is going to deteriorate over time. It is planned that in SR27 Circ 300km/yr (1,800km) will be replaced. This represents c.4% of the total asset stock for distribution mains. Targeting the right materials and locations will be key to ensuring a continuity of supply to customers.

Note:

The EHI % scores presented in the above tables and in DBP Table 3b are based only on the date of when that asset was installed and an expected age for that asset category. Discrete expected lives have not been applied (as in the raw water example) and the condition of the asset that may adject the remaining life is not included in the EHI calculation. The work to progress this EHI scope methodology will progress in SR21 and focus on 10 Management approach areas. The remaining asset categories will be addressed in SR27.

8 Block C – Asset health under alternative scenarios

8.1 Overview

Scenarios A and B have been provided but there is no measurable impact on EHI given the minimum change in the AR3 IPS does not change between the proposed scenarios.

The impact of Scenario B on AR3 and hence EHI is predominantly in additional investment in

- WTW MEICA (15% increase on Scenario A investment) and
- mains flushing / iron pipe replacement. Where flushing will not impact the EHI score.

The impact of Scenario C on AR3 and EHI is in the reduction in

- AC mains replacement (20% reduction on Scenario A investment) which is equivalent to 270km of mains replacement out of a total 1350km.

At this point EHI is not accurate enough to show any specific changes as a result of these small investment changes in a 6yr period.

Appendix A – Expected Life Tables used for DBP Table 3b EHI and DBP Table 3a

Water Infrastructure asset lives used for EHI calculation (Basic)

Table 18 Water Infrastructure asset lives used for EHI calculation (Basic)

Mains Category	Material Code	Material Description	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live	SR27 assumption
Trunk Mains	AC	Asbestos Cement	90*	90	< 90
	Other	Other	120	105 - 115	
Distribution Mains	AC	Asbestos Cement	90*	90	< 90
	CI	Cast Iron***	121	105 - 115	
	CIL	Cast Iron Lined	121		
	GI	Grey Iron	121		
	DI	Ductile Iron	97		
	DIL	Ductile Iron Lined	97		
	PVC	Polyvinyl Chloride	107		
	uPVC	Unplasticised Poly Vinyl Chloride**	107		
	MOPVC	Molecular Oriented PVC	107		
	HEP20	HEP20	107		
	SI	Spun Iron	108		
	ST	Steel	105		
	Other		113		

*The remaining life of Asbestos cement pipes is deemed to be 20yrs (through the studies that have been undertaken – see Water Continuity Technical Appendix)and so a plan is underway to have this all replaced. With this in mind EHI will reflect this in the final submission. The LTIS investment already assumes full replacement.
** it is anticipated that UPVC pre 1974 will start to exhibit failures so the asset life is under review
*** it is anticipated that Cast / spun Iron will start to exhibit failures so the asset life is under review.

Other Water Network asset lives used for EHI calculation (Basic)

Table 19 Other Water Network asset lives used for EHI calculation (Basic)

Asset Category	DBP Table 3b Expected Life (yrs)	DBP Table 3a Expected Life (yrs)
Water Meters	15	

Wastewater Infrastructure asset lives used for EHI calculation (Basic)

Table 20 Wastewater Infrastructure asset lives used for EHI calculation (Basic)

Mains Category	DBP Table 3b Expected Life (yrs)	DBP Table 3a Expected Life (yrs)
Gravity Mains	300	
Rising Mains	30	

The expected life is set at the level of the mains category (gravity or rising mains) rather than split by material.

Civils asset lives used for EHI calculation (Basic)

Table 21 Civils asset lives used for EHI calculation (Basic)

Civils Category by function	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live	Civils Category by function	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live
Access Roads	51	80	Sedimentation Tank	64	80
Activated Sludge Equipment	70		Septic Tank	63	
Balancing Tank	100		Sewage Pumping Wet Well	48	
Bio-filter	58		Sewage Pumping	77	
Buildings	156		Sludge Blanket Clarifier	45	
Chemical Dosing pH Adjustment	36		Sludge Pressing	45	
Chemical Dosing	51		Sludge Pumping	45	
Chlorine Dosing	32		Sludge Thickening Tank	39	
Coarse Screening	45		Storm Water Screens	45	
Dissolved Air Flotation	64		Treated Water Storage Tanks	69	
Effluent Discharge	36		Ultra-violet Disinfection	54	
Emergency Generator	57		Washwater Tank	52	
GAC	45		Water Dry Well	55	
Grit Removal	52		Water Pumping	43	
Membrane Plant	45		Water Sampling	59	
Odour	62				
Ozone Dosing Plant	54				
Power Supply	45				
RGF	45				

MEICA used for EHI calculation (Basic)

Table 22 MEICA used for EHI calculation (Basic)

Equipment Class Code	Equipment Class	Service Type	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live	Equipment Class Code	Equipment Class	Service Type	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live
JJ	CLASSIFIER	Waste	25	20	LG	AIR DRYER	Waste	20	20
		Water	25				Water	20	
JK	THICKENER	Waste	80		LI	COMPACTOR	Waste	15.5	
		Water	80				Water	16	
JL	AERATOR	Waste	20.5		LN	MACERATOR	Waste	21.5	
		Water	20		LR	DISTRIBUTOR	Waste	57.5	
JM	DRAW OFF EQUIPMENT	Waste	80				Water	50	
		Water	80		LU	PUMP	Waste	14.5	
JN	DRIVE SYSTEM	Waste	20				Water	14.5	
		Water	15		LX	PRESS	Waste	20	
JO	GENERATOR	Waste	27.5				Water	20	
		Water	27.5		MC	PRESSURE VESSEL	Waste	20	
JP	OPERATION TECHNOLOGY	Waste	20				Water	20	
		Water	14.5		MI	FAN	Waste	28.5	
JQ	THERMAL DRYER	Waste	20				Water	28.5	
		Water	20		MJ	FILTER	Waste	25	
JS	HEAT EXCHANGER	Waste	30				Water	25	
		Water	30		MO	SCREEN	Waste	23.5	
JU	BLOWER	Waste	10.5				Water	25	
		Water	14.5		MP	BATTERY BACKUP	Waste	15	
JX	BOILER	Waste	22.5				Water	15	
		Water	22.5		MQ	EMERGENCY EQUIPMENT	Waste	20	
KD	DETECTION EQUIPMENT	Waste	10				Water	20	
		Water	15		MR	HV SWITCHGEAR	Waste	30	
KI	CRANES/HOISTS	Waste	40				Water	30	
		Water	40		MS	LV SWITCHGEAR	Waste	27.5	
KO	MIXER	Waste	20.5				Water	21.5	

Equipment Class Code	Equipment Class	Service Type	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live	Equipment Class Code	Equipment Class	Service Type	DBP Table 3b Expected Life (yrs)	DBP Table 3a expected live
		Water	35.5		MW	SCREENINGS LAUNDER	Waste	25	
KU	DOSING SYSTEM	Waste	25		NC	SCRAPER	Waste	28.5	
		Water	31.5				Water	20.5	
KX	MONITORING EQUIPMENT	Waste	17.5		NL	VALVE	Waste	21.5	
		Water	15.5				Water	45.5	
LC	CONVEYOR	Waste	20.5		NR	TANK OR SILO	Waste	80	
		Water	36.5				Water	80	
LF	COMPRESSOR	Waste	11.5		NW	WEIR	Waste	80	
		Water	11.5				Water	80	
					SR	REGULATORY SAMP TAP	Waste	20	
							Water	20	
					TL	TELEMETRY	Waste	28.5	
							Water	11.5	
					VS	VARIABLE SPEED DRIVE	Waste	15	
							Water	15	

Table 4: Mains and Sewers Condition

Commentary

Contents

1 Overview

1.1 Purpose

Table 4 will contribute towards meeting the *SRC27 Business Plan Guidance and Definitions* requirement for Scottish Water to "provide a measure (or measures) of asset condition across its asset base and, as far as possible, translate the impact of maintenance activities on asset condition into tangible consequences that customers will understand." The data in this table is more granular than the data on infrastructure assets in Draft Business Plan (DBP) Table 3b.

This assessment is being undertaken to understand the potential requirements for asset replacement over SRC27. The data can be used to check whether replacement interventions are keeping pace with deterioration and to determine whether it can provide further insight into emerging asset risks.

It is recognised by Scottish Water and WICS that this is a new business requirement and as such the tables and calculations are at an early stage of development. The inputs to the tables (burst and collapse, infill methodology, calculation methodology) will evolve and revise the current table information. Examples of analysis are provided with the caveat of the potential changes over the next two years as we focus on improving the information in the tables to March 2027.

Scottish Water notes that whilst burst and sewer collapse information is an important element in our investment decision making it is not the sole driver. Examples are provided from our asset Management Approach policies that include other considerations that are included before it has been included in the SR27 DBP table 3a investment lines.

We will be performing additional internal checks and will continue to update our methodology between the Draft Business plan (DBP) and Final Business Plan (FBP) submissions.

Additionally, we invite review of the table and commentary to determine useful content, and any additional information required.

1.2 Overview of table

DBP Table 4 is used to show the requirements for asset performance/condition by material type (water mains), and function (sewers), condition grade relative to the burst/ collapse rate and Equipment Health Index.

Data in this table is categorised by Water Mains Data (Blocks A, B, C, D and E) and Wastewater Sewers Data (Blocks F, G, H, I and J). Both Water Mains and Wastewater Sewers condition have been graded against the required grading and Equipment Health Index (EHI) band definitions provided by WICS in the *SRC27 Business Plan Guidance and Definitions*.

2 Water Mains Condition

2.1 Background

To calculate water mains condition a number of options relating to how bursts are counted and assessed were considered:

- Number of bursts by total material length – this did not provide sufficient granularity to provide insight on the asset base.
- Number of bursts by Unitary Authority – although possible for AC mains this was unable to be replicated this for all the material types or within the model that project changes in bursts

Instead of the above options, bursts have been assessed at a Water Supply Zone (WSZ) level one level below a Water Resource zone (WRS) as this provides greater granularity than just considering bursts by total material length. There are Circa 1400 WSZ in Scotland. A WSZ is defined by Scottish Water as a discrete geographical area within which all customers receive water from a common source or set of sources and where water quality is expected to be relatively uniform. Each WSZ does not exceed a population of 100,000.

The following 3 steps describe how this approach was implemented:

Step 1

The length of each material was calculated by grouping the data by both material type and WSZ (Water Supply Zone), then summing the total pipe length within each group. These lengths were converted from meters to kilometres to standardise the units. Even if the total length of a material across all WSZs was less than 1000 km, the calculation still captures the actual length present in each WSZ. This methodology was then included within the Level 2 Water Asset Risk Model (WARM) to allow for the projected number of bursts with and without investment to be run for Blocks B and C.

Step 2

The associated 4-year average burst rate was then calculated using the following periods:

- Block A Current (2021 – 2024)
- Block B Deterioration no investment (2030 – 2033) – model output
- Block C Investment (2030 - 2033) – model output

To allow fair comparison of burst rates across materials and zones, the number of bursts was then normalized to a per 1000 km basis. This means the burst rate reflects what it would be if there were 1000 km of that material, regardless of the actual observed total length.

Step 3

For each asset condition category, the total equivalent length was summed and added to the relevant material type in Table A, B, C. (as per the Final Methodology).

It should be noted that the number of bursts used in the calculations within DBP Table 4 is lower than the overall burst rate provided in the annual return documentation. This is because bursts must be allocated to the nearest main based on the coordinates recorded at the burst event in Ellipse. However, if the coordinates are missing or incorrect, the burst cannot be allocated to a pipe or material category. Currently, accuracy is ~80% of all bursts are allocated to a pipe and material. The improvement activities to increase this accuracy is noted in Section 2.6. Once completed it will allow all bursts to be assigned and utilised in the analytical models thus ensuring reporting of pipe deterioration aligns to the overall burst rate data provided in annual returns.

Figure 1 below shows the high-level process followed

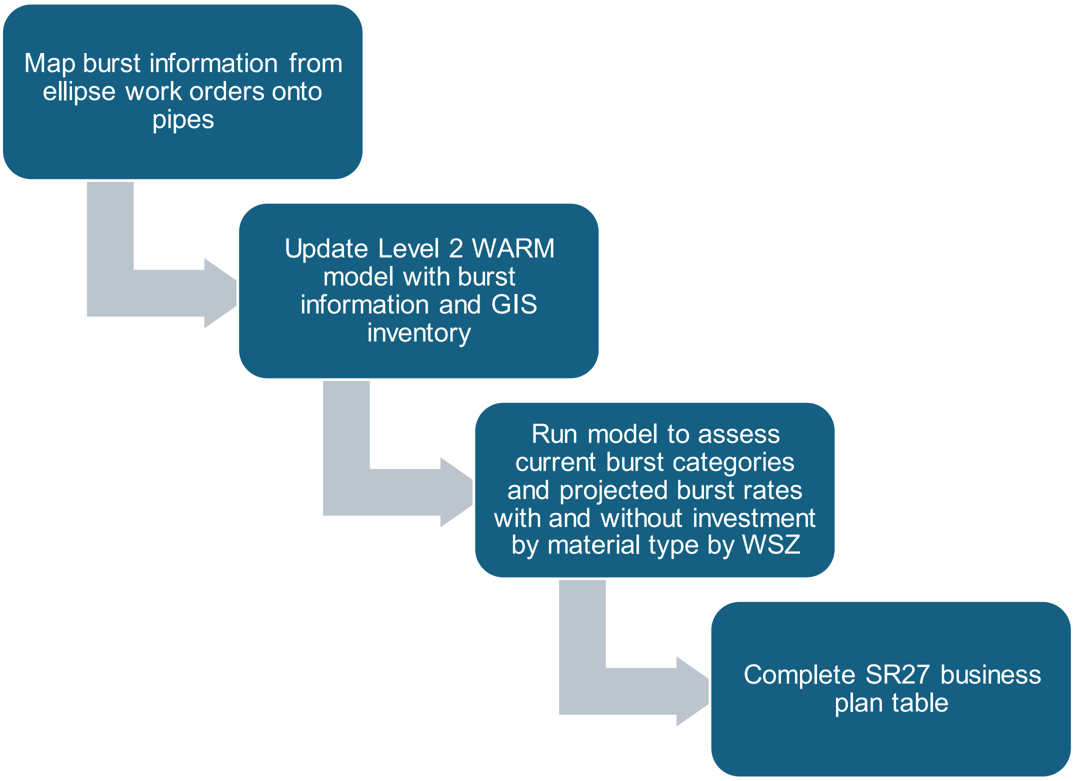


Figure 1 Methodology for Water Mains Conditioning high-level process flow

2.1.1 Condition grade definitions for water mains

The following section describes how the condition categorisations have been applied to the burst data sets.

Table 1: Burst categorisations

Category	Description
CG 1 - Excellent	Bursts average up to 125/1000km/annum over four years, (equivalent to 2000 metres or more between bursts over the four-year period).
CG 2 - Good	Bursts average greater than 125 up to 250 burst/1000 km/annum over four years, (equivalent to less than 2000 metres down to 1000 metres between bursts over the four-year period).
CG 3 - Adequate	Bursts average greater than 250 up to 500 bursts/1000km/annum over four years (equivalent to less than 1000 metres down to 500 metres between bursts over the four-year period).
CG 4 - Poor	Bursts average greater than 500 up to 1000/1000 km/annum over four years (equivalent to less than 500 metres down to 250 metres between bursts over the four-year period).
CG 5 - Very Poor	Bursts average greater than 1000/1000 km/annum over four years (equivalent to less than 250 metres between bursts over the four-year period).

2.1.2 Assumptions

- All pipe replacements are assumed to be polyethylene (PE).
- Only ~80% of bursts are linked to pipe and material. Note there is data/process improvement identified to improve this process to ensure bursts are associated with the correct water main as described in Section 2.6
- The model used only replaces specific lengths on mains that show higher deterioration to reduce burst numbers to an average rate. When projects are scoped longer lengths are replaced than identified in the model due to several factors such as when it is more economic to address longer lengths of pipe due to mobilisation cost of contractors, and where there would be less impact on the community through fewer repeat visits.

Materials have evolved from cast iron, spun iron, ductile iron, asbestos cement (AC), PVC to PE over the last 30 years. The highest burst rates and service risks are seen in spun iron, cast iron, asbestos cement, and older PVC. For instance, PVC-U used before 1984 often suffers from longitudinal fractures, leading to extensive damage and costly repairs. Figure 2 below illustrates the projected deterioration rates.

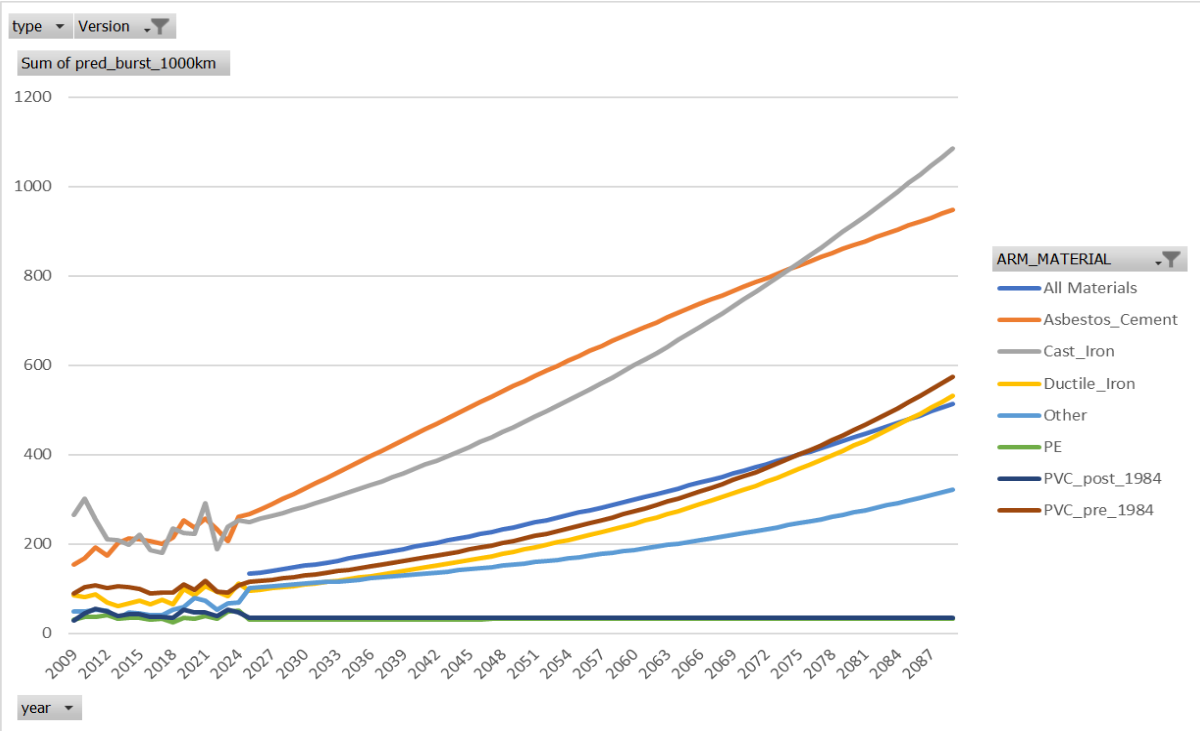


Figure 2 Water asset risk model burst rate trend

When combined these 4 materials make up 97% (15,000km) of the assets that are over 60 years old. While the current focus is on replacement of AC material pipes there will be on going work in SR27 to assess spun iron and UPVC pipe failure trends.

2.1.3 Exclusions

Trunk mains (~5,600km) and Raw water mains (~1,600km) are currently not included in this analysis as the Level 2 Water Asset Risk Model (WARM) model does not cover these asset classes. They have longer expected life lengths and different failure rates, and so additional data needs to be collected to calibrate additional models. Once new models are built (data collection on going) they will improve the asset replacement projections for the management approaches and the long-term projections.

2.1.4 Link to SR27 investment

Whilst burst rate insight is a key factor in investment decision making for water mains distribution within Distribution Mains Management Approach 111 (MA111) it is considered alongside other factors/outcomes (i.e. Interruption to Supply (ITS), Low Pressure (LP), and Repeat Customer Interruption (RCI)) to ensure a wider, value driven decisions. MA111 seeks to address the highest frequency of interruptions, maintain stable burst rate performance, and ensure that network improvements are made where necessary to meet customer expectations and regulatory requirements. It aims to address these issues through various intervention types, including repair, refurbishment, replacement, and investigation.

Therefore, given the presence of other factors in the decision-making process there is not a direct correlation between burst rate and investment proposed.

2.2 Block A Length of Water Mains (km) by Condition Grade as at 31 March 2025

DBP Table 4 only includes distribution mains (<300mm dia.) and excludes trunk and raw water mains as described above.

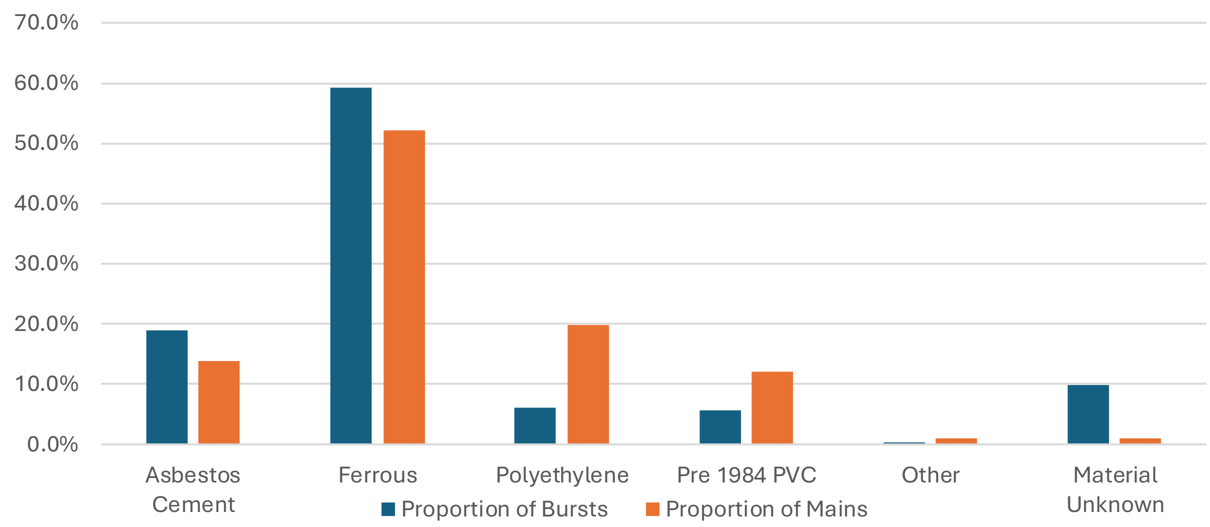
Block A shows the March 2025 position of distribution mains based on last 4yrs average burst rate. The March 2025 condition grade is calculated by dividing the 4yrs average number of distribution mains bursts recorded for a specific material type by the corresponding length within an individual Water supply zone (WSZ) distribution network. The length of main for each condition grade by material is then summed and included in DBP Table 4. The length of mains is provided as bursts per 1000km as per the grading table. Table 2 shows the summary of this analysis.

Table 2 Summary of KM of Water Mains per Condition Grade – March 2025

Block A: Length of Water Mains (km) by Condition Grade as at 31 March 2025			
Line reference	**Condition Grade (CG)**	**Total KM**	**% of mains in each category**
4.1	CG 1 - Excellent	27,083	61%
4.2	CG 2 - Good	8,557	19%
4.3	CG 3 - Adequate	6,975	16%
4.4	CG 4 - Poor	1,666	4%
4.5	CG 5 - Very Poor	155	0%
4.6	**Total length**	**44,436**	
4.7	% of asset length in condition grade 4 and 5	4.10%	

Table 2 shows that the model has identified ~1,800km of water distribution mains in poor or very poor condition.

The **Asset Management approach MA111 Water Distribution mains** analysis shows a burst profile by material (Figure 4) and by age (Figure 5). There are a greater average number of bursts, per mains length recorded, against ferrous and asbestos cement materials which is shown out in the Block A table.



The relationship between age burst frequency is shown below, assets older than 50 years

Figure 4 Proportion of burst and mains material by type (%) over 20 years

(installed prior to 1974) are contributing a higher proportion of bursts, while newer assets installed 1980 onwards are contributing fewer bursts in comparison to the length of mains.

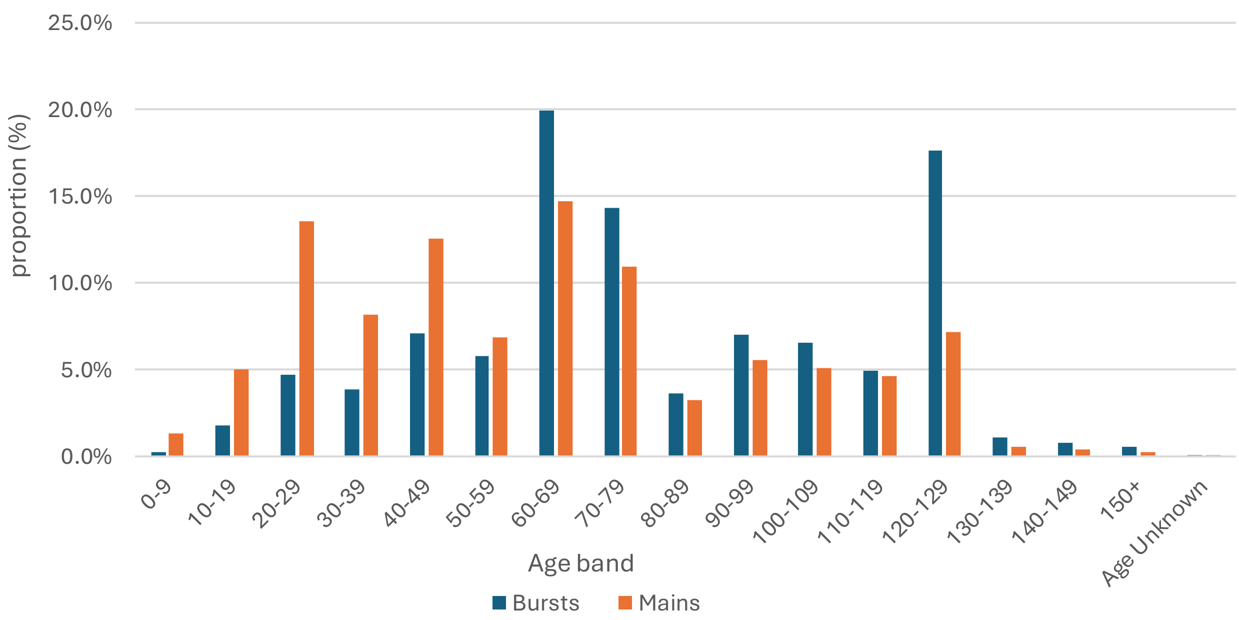


Figure 5 Proportion of bursts and mains by asset age brand (%)

The SR27 DBP highlights that whilst bursts are a contributing factor to water mains replacement the primary driver is the impact on customers and AC mains account for the majority of recuring customer interruptions (SR27 Draft Technical Appendix 002 – Water Continuity section 2.5).

2.3 Block B Length of Water Mains (km) by Condition Grade as at 31 March 2033 (No Investment, Asset Deterioration Case Only)

The 2033 baseline scenario (no investment for mains replacement in SR27) uses Level 2 WARM burst models to forecast the number of bursts for that year, converting it to a burst rate based on no investment from 2027 to 2033. The predicted bursts by pipe and material are used to determine the condition grade per Water Supply Zone (WSZ). The overall length of mains for each condition grade is summed and listed in the table as bursts per 1000 km. Table 2.3.1 shows the overall summary.

Table 3 Summary of KM of Water Mains per Condition Grade as at 31 March 2033 with no investment (i.e. asset deterioration only) – data output from modelling

Block B: Length of Water Mains (km) by Condition Grade as at 31 March 2033 (No Investment, Asset Deterioration Case Only)			
Line reference	**Condition Grade (CG)**	**Total KM**	**% of water main length in each condition grade**
4.8	CG 1 - Excellent	**22,539**	51%
4.9	CG 2 - Good	**8,815**	20%
4.10	CG 3 - Adequate	**10,544**	24%
4.11	CG 4 - Poor	**2,407**	5%
4.12	CG 5 - Very Poor	**131**	0%
4.13	**Total length**	**44,436**	
4.14	% of asset length in condition grade 4 and 5	5.71%	

Table 3 shows the WARM model output has an increase in the length of mains that have more bursts (and hence worst condition grading) if there is no investment over the SR27 period. It does not show the number of service interuptions a customer may experience or the impact from improved pressure managment.

2.4 Block C Length of Water Mains (km) by Condition Grade as at 31 March 2033 (Proposed Investment Case)

This scenario, based on the reference scenario, focuses on maintaining the burst rate of 155 to 160 / 1000km in line with the current Distribution main (MA111) policy.

Once the number of bursts is predicted by pipe and material and the length of expected pipe on the worst pipes has been replaced with PE pipe (targeting AC), the overall length of main and bursts per WSZ is used to assign a condition grade. The length of main for each condition grade by material is then summed and included in DBP Table 4. The length of mains value is provided as bursts per 1000km as per the grading table.

The output profile (i.e. the forecast burst profile) of the Level 2 WARM model is based upon discrete, strategic asset length replacements to reduce bursts, however in reality it is more practical and efficient to bundle asset interventions (I.e. replace longer lengths) in a network. Additional considerations include mobilisation cost of contractors, impact on the community as there are fewer repeat visits, and impact on interconnected sections of network due to changes in pressure.

This table is caveated in that the WARM model will only replace specific lengths that show higher deterioration that results in additional bursts as explained in section 2. Table 4 shows the overall "asset condition grade" by km as per the WARM model output. The actual investment developed for SR27 will take other considerations into account (repeat customer interrupts) so may not reflect the change in poor and very poor length of reduction shown in the DBP table 4 (C). There is an intention to improve the WARM model for SR27 to identify specific lengths of water main that have bene identified for replacement to help reflect the actual proposed work and the impact on the projected burst rates.

Table 4 Summary of KM of Water Mains per Condition Grade as at 31 March 2033 as a result of the Proposed Investment Case – data output from modelling

Block C: Length of Water Mains (km) by Condition Grade as at 31 March 2033 (Proposed Investment Case)			
Line reference	**Condition Grade (CG)**	**Total KM**	**% of water main length in each condition grade March 25**
4.15	CG 1 - Excellent	**25,953**	61%
4.16	CG 2 - Good	**8,272**	19%
4.17	CG 3 - Adequate	**8,644**	16%
4.18	CG 4 - Poor	**1,540**	4%
4.19	CG 5 - Very Poor	**27**	0%
4.20	**Total length**	**44,436**	
4.21	% of asset length in condition grade 4 and 5	3.53%	

Table 5 shows that with targeted replacement (4% of the asset base) per the WARM model, there is a minimal improvement in pipe condition grade (based on age and projected busts) from excellent to adequate. SR27 investment has been prioritised based on impact on repeat customer contacts as so the change in the DBP Table 4 (C) over SR27 may be different.

Table 5: % of Water Mains per Condition Grade as at 31 March 2025 and 2033 as a result of the Proposed Investment Case – data output from modelling

Line reference	**Condition Grade (CG)**	**% of water main length in each condition grade March 25**	**% of water main length in each condition grade March 33**
4.15	CG 1 - Excellent	61%	58%
4.16	CG 2 - Good	19%	19%

4.17	CG 3 - Adequate	16%	19%
4.18	CG 4 - Poor	4%	3%
4.19	CG 5 - Very Poor	0%	0%
4.20	**Total length**		
4.21	% of asset length in condition grade 4 and 5	4.10%	3.53%

Review of AC pipe material

Table 6: Summary of KM of Asbestos Cement Water Mains per Condition Grade as at 31 March 2025 and 2033 as a result of the Proposed Investment Case – data output from modelling

Block C: Length of Water Mains (km) by Condition Grade as at 31 March 2033 (Proposed Investment Case)				
Line reference	**Condition Grade (CG)**	**Asbestos cement (AC) March 2025**	**Asbestos cement (AC) March 2033**	**Change in AC (km) March 25 to March 33**
4.15	CG 1 - Excellent	1,929	644	-1,284
4.16	CG 2 - Good	1,450	1,938	488
4.17	CG 3 - Adequate	1,326	1,084	-242
4.18	CG 4 - Poor	622	177	-445
4.19	CG 5 - Very Poor	98	5	-93
4.20	**Total length**	**5,424**	**3,848**	-1,576
4.21	% of asset length in condition grade 4 and 5	13.28%	4.73%	

The model output in Table 6 shows a theoretical improvement in condition grades (CG4 and CG5) primarily due to the proposed targeted replacement of specific AC mains with PE pipe material to maintain a specific burst rate. It should be noted that the actual change in grade may not reflect this as a result of delivery of SR27 asset replacement projects as explained above. The SR27 DBP Water Continuity Technical Appendix 002 Water Continuity (section 2.5). also notes that while bursts contribute to water mains replacement, the primary concern is customer impact and that AC mains are responsible for most recurring customer interruptions.

2.5 Accuracy and reliability

The lines in Blocks A, B, and C have been assigned a C5 confidence grade as work is still ongoing to consolidate the burst data and assign it to the correct pipe material according to the improvement plan outlined in Section 2.6. Additionally, as part of the improvement plan activities between DBP and FBP submission, we will explore whether analysing at a more granular level than the Water Supply Zone (district metering area DMA) would contribute to better defining the material in each condition grade category.

2.6 Improvement Plan

Draft Business Plan to Final Business Plan

- Water mains burst methodology will be reviewed to assess if working at a more granular District Metering Area (DMA) approach would better reflect an improved spread of bursts based on water supply zone for all materials.

- Update the Level 2 WARM with the AR25 asset register and refresh the burst data.

Future proposed improvements

A programme of proposed work is being developed, and a high-level overview will be available for the FBP.

- Improve the process of mapping bursts to pipes for greater coverage and establish a single source of burst information that has been assured for use and assigned to a pipe and increase the % of bursts assigned to pipes.
- Update the scenario to include the mains pre-selected for replacement (i.e. those that meet the Asset Management policy and have been selected for SR27 first) as a constraint to understand the real impact of the planned investment on the burst rate.
- Re-developing the optimiser to better align with the scenarios to support the Management Approach and the burst tables.
- Link the Level 1 and Level 2 model outputs for better granularity and to provide visibility of changes in all material types rather than AC and non-AC.
- Develop Trunk Main and raw water deterioration models to improve the asset replacement projections.
- Assess how pipe condition and deterioration and impact of operational activities (pressure reduction) can be applied to EHI
- Include climate change (soil moisture content, impact of vehicle traffic, different pipe material degradation rates etc) in the models to improve the assessment of bursts.
- Assess the Level 2 model to see how trunk main and raw water mains asset classes degradation can be modelled and included in the tables.

3 Sewer Condition Grading

3.1 Background

The March 2025 sewer collapse rate is calculated by dividing the number of collapses recorded by the corresponding length of the network. The value is provided as collapses per 1000km. This has not been split by material as the Level 2 wastewater asset risk model (WWARM) was not developed at function or material level (material was included in the model as a variable rather than individual material models due to the lack of historical data).

The March 2025 collapse rate data utilised for DBP Table 4 aligns with the rate in the annual return for AR24. The forecast collapse rates are based on the expected rate of change forecast by the models applied to the AR24 baseline collapse rate. There is no asset replacement investment included as most of the investment is fix on fail repairs.

The degradation model Waste Water Asset Risk Model (WWARM) shows a slight change in projected collapses from March 2025 to March 2033, but it does not change in the sewer collapse rate /condition (range 25 to 50 collapse per 1000km/yr over the SR27 period). This is due to the very long life of sewer pipe materials.

The current intervention policy and SR27 investment projections are based on a fix on fail policy for non-critical sewers and an inspection programme to identify and then address poor condition for critical assets.

3.1.1 Assumptions

- Sewage pumping mains are currently not modelled. It is proposed to develop a degradation model for SR27.

3.1.2 Link with SR27 Investment

When considering Sewer Condition Grading, three asset classes are taken into consideration:

- Gravity Sewers
- Waste water ring mains
- Waste water rising mains

3.1.2.1 Gravity Sewers

The sewer asset replacement investment promoted in SR27 is not driven by collapse rates alone. The policy for asset replacement in the **MA113 Gravity Sewers Approved V2.1** document outlines a comprehensive approach to managing gravity sewers, focusing on both critical and non-critical sewer assets. (see note below).

For **critical sewers**, the policy includes:

- **Proactive inspection** of all critical sewers every 20 years.
- **Re-inspection** of sewers identified as condition grade 4 every 5 years.
- **Proactive refurbishment or replacement** of sewers identified as condition grade 5, with the choice between refurbishment and replacement depending on the asset's characteristics and the defects being addressed.

For **non-critical sewers**, the policy is more reactive:

- **Responsive refurbishment or replacement** after a service impact and subsequent investigation identifies the sewer has failed the action is to repair the failure).

The policy also includes guidelines for **sewer cleaning**:

- **Regular proactive cleaning** of identified candidate sewers, supported by surveys, failure and customer contact history, network modelling, flood management planning, or property use data 1.

See foot note: Definition of critical and non-critical sewer[1].

3.1.2.2 Sewage pumping mains (column Ref 9)

With regard to sewage pumping mains that are also included in DBP Table 4, **Wastewater pumping mains Management Approach MA012** sets out a detailed policy on interventions.

Sewer pumping mains, also known as wastewater pumping mains, can fail due to several reasons such as:

1. External Corrosion: This occurs when the outer surface of the pipe is exposed to corrosive elements in the soil or groundwater, leading to deterioration over time.
2. Internal Corrosion: This happens inside the pipe due to the sewage composition, flow rate, and pressure. Hydrogen sulphide gas produced by sewage can generate sulfuric acid, which attacks the pipe material.
3. Mechanical Failure and Joint Leakage: Mechanical failures can be caused by third-party damage, ground movement, or poor installation. Joint leakage can occur due to displacement or damage at the joints.
4. Aeration or Valve Faults: Air can enter the pumping mains through pump impeller cavitation or when pumps operate at low sewage levels. Trapped air and gases can reduce flow capacity and accelerate corrosion.
5. Age-related Deterioration: As the pipes age, they become more susceptible to all the above factors. Older pipes, especially those made of iron, are more prone to corrosion and failure.
6. Environmental Factors: Climate change impacts such as increased drought conditions, extreme rainfall, and coastal erosion can accelerate the deterioration of pumping mains.

These factors can lead to bursts, leaks, and other failures, causing environmental pollution, sewer flooding, and public health risks. The severity of the above factors is heavily influenced by the material of the pumping mains. Figure 6 shows the material split of materials used in pumping mains and Figure 7 shows the split of those materials by installation date band.

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[1] **Critical sewers** are those whose serviceability is deemed essential to the overall service provided to customers. Their failure would have a significant detrimental impact on customers, communities, and/or the environment. The criteria for defining critical sewers include:

- **Location**: Proximity to sensitive areas such as waterbodies, shellfish or bathing waters, buildings (especially education and medical facilities), railways, key arterial roads, transport or utility buildings, and sites used for national or international events.
- **Size**: Larger diameter sewers are more likely to be critical.
- **Effluent type**: Failures of foul and combined sewers are more likely to impact human and environmental health.
- **Material**: Certain materials, like brick and masonry, are considered critical due to their failure mechanisms.

Non-critical sewers are those whose failure may result in an 'Avoid' or 'Do Less' risk appetite definition or have limited impact that does not breach the risk appetite. These sewers typically have minimal observable impact when they fail, as sewage released from the sewer may be absorbed into the ground before any impact can be observed

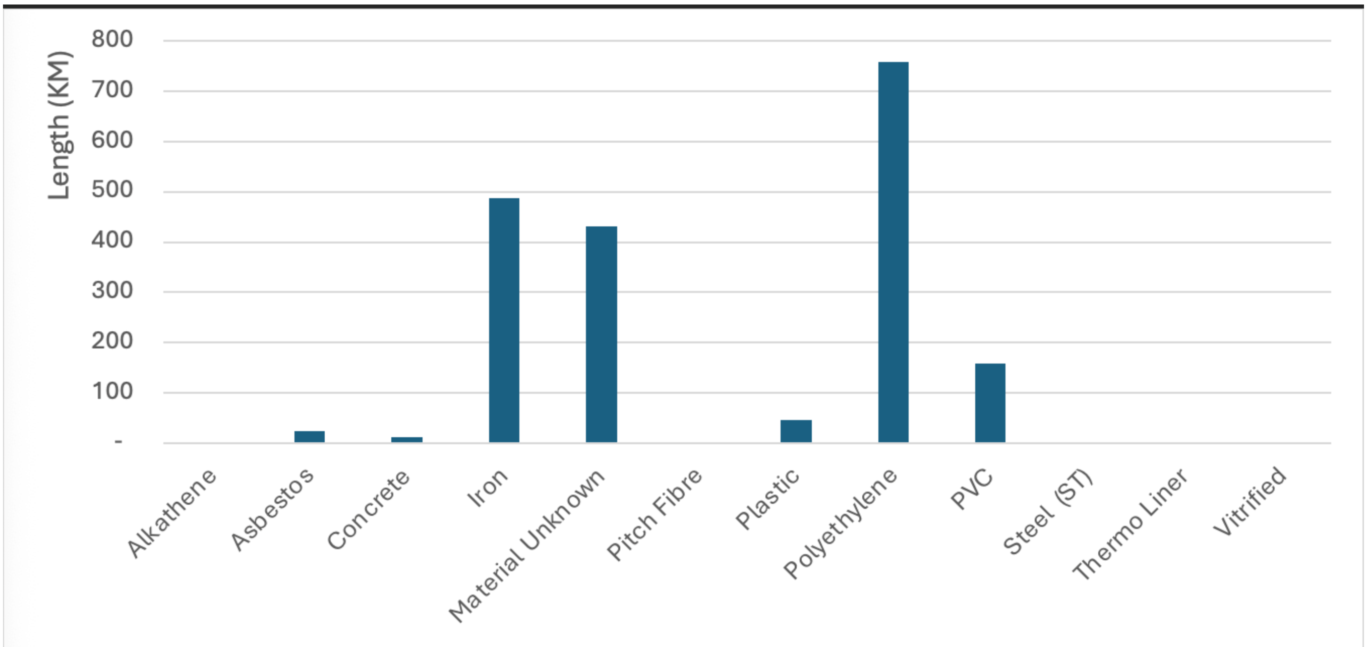

Figure 6 Pumping mains material

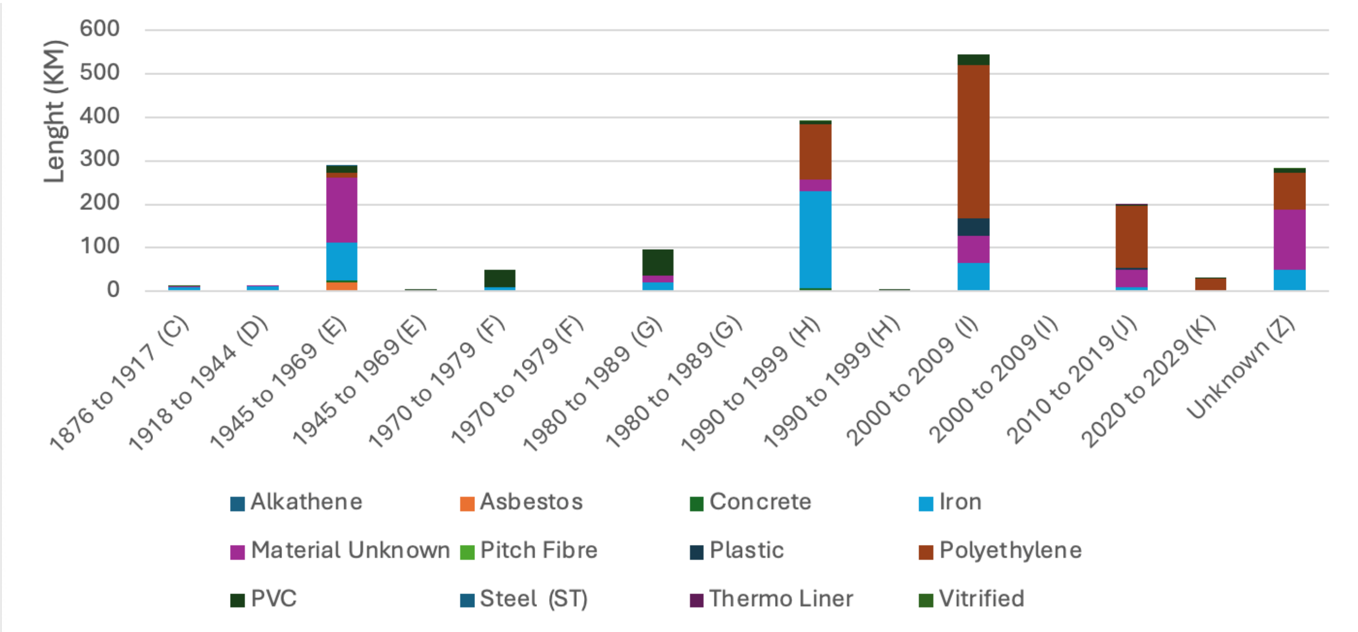

Figure 7 Age profile of pumping mains by material

The difference between critical and non-critical assets in the context of wastewater pumping mains is primarily based on the potential impact of their failure and the associated risk appetite definitions:

Critical Assets:

- **Location and Characteristics**: Critical assets are those located in areas where failure could lead to significant consequences. This includes assets upstream of or near bathing waters, shellfish growth/hygiene areas, river waterbodies, railways, primary arterial roads, key ferry terminuses, and buildings.

- **Impact**: The failure of critical assets can lead to severe environmental pollution (Category 1-2 Environmental Pollution incidents (EPI)s), internal sewer flooding, impacts on bathing waters, and public safety risks.

Non-Critical Assets:

- **Location and Characteristics**: Non-critical assets are those located in areas where failure would have less severe consequences. This includes assets intersecting smaller waterbodies, located within large urban areas or sensitive environmental areas, and other locations where the impact of failure is limited.
- **Impact**: The failure of non-critical assets can lead to less severe environmental pollution (Category 3-4 EPIs) and external sewer flooding.

As a result of this classification (critical/non-critical) the following policy for asset replacement has been developed:

1. **Critical Assets**:
    - **Proactive Replacement/Refurbishment**: Approximately 15 km of critical pumping mains are replaced or refurbished each year. The intervention program aims to address all assets that will be over 50 years old by 2050. Assets are prioritized based on age and burst history.
    - **Responsive Repairs**: Bursts are repaired as they occur, both before and after the intervention trigger.
    - **Air Valve Inspections**: All air valves are inspected every 10 years and serviced or replaced as required based on their condition.

2. **Non-Critical Assets**:
    - **Responsive Replacement/Refurbishment**: Assets are replaced or refurbished after a trigger of three bursts in two years.
    - **Responsive Repairs**: Bursts are repaired as they occur, both before and after the intervention trigger.
    - **Air Valve Inspections**: All air valves are inspected every 10 years and serviced or replaced as required based on their condition.

The policy aims to ensure that critical assets are proactively managed to prevent failures, while non-critical assets are managed responsively based on their burst history.

3.1.3 Process overview

Figure 8 below shows the high-level process followed.

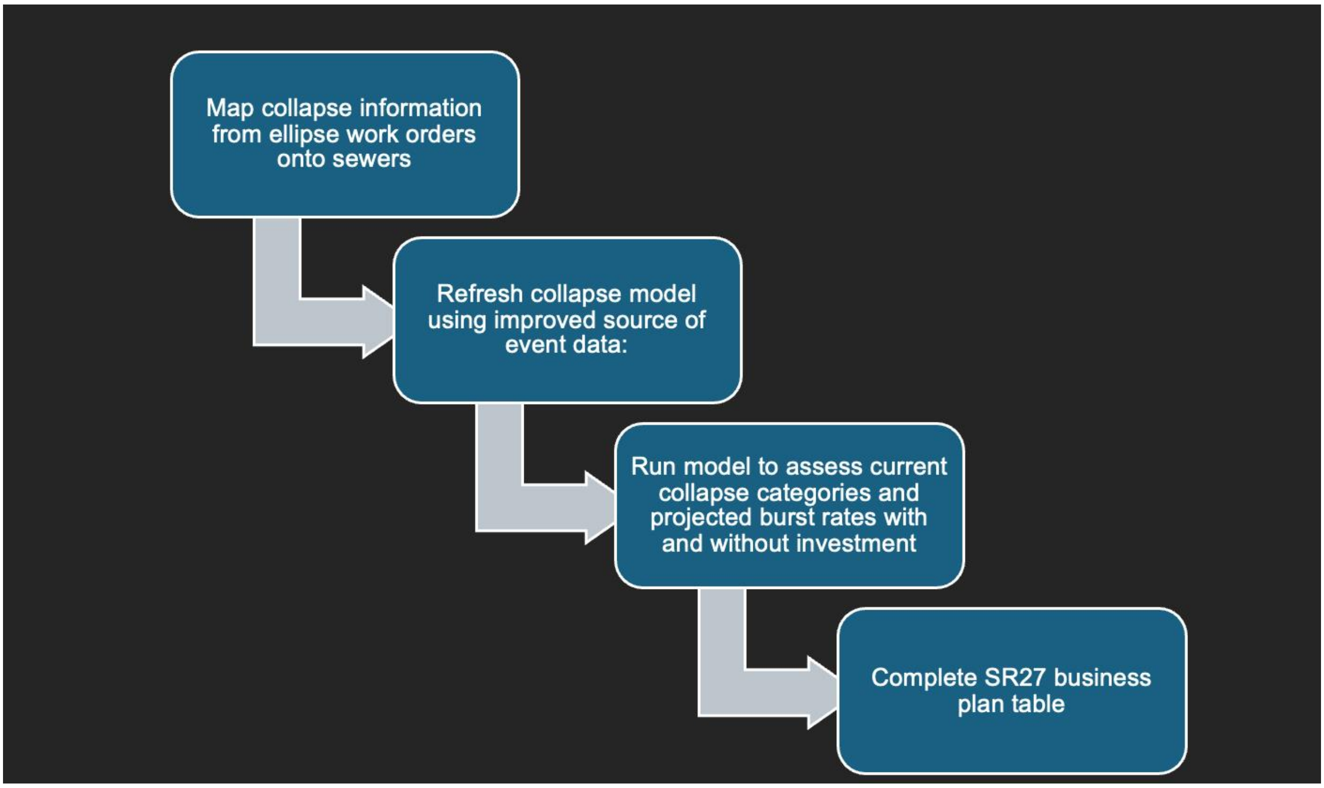

Figure 8 Methodology for Sewer Condition Grading high-level process flow

3.1.4 Condition grade definitions for wastewater sewers

The following section describes how the condition categorisations have been applied to the sewer data sets.

Table 7: Condition categories

Category	Description
CG 1 - Excellent	Collapse average up to 12/1000km/annum over four years, (equivalent to 20km or more between collapses over the four-year period).
CG 2 - Good	Collapse average greater than 12 up to 25 burst/1000 km/annum over four years, (equivalent to less than 20km metres down to 10km between collapses over the four-year period).
CG 3 - Adequate	Collapse average greater than 25 up to 50 collapses/1000km/annum over four years (equivalent to less than 10km down to 5km between collapses over the four-year period).
CG 4 - Poor	Collapse average greater than 50 up to 100/1000 km/annum over four years (equivalent to less than 5km down to 2.5km between collapses over the four-year period).
CG 5 - Very Poor	Collapse average greater than 100/1000 km/annum over four years (equivalent to less than 2.5km between collapses over the four-year period).

3.2 Block F Length of wastewater sewers (km) by condition grade as at 31 March 2025

The WWARM model examines all sewers without distinguishing by function (combined, foul only, surface water) or material type, as these factors do not affect failure rates in the model. By dividing total sewer collapses by total sewer length, we get a basic idea of sewer condition. Efforts are ongoing to refine this analysis by catchment and material, with results to be included in the FBP submission.

As described above reviewing sewers by function is not available in models however the Asset Management Approach Wastewater Pumping Mains MA012 has analysed the recent bursts (2012- 2023) against material type and by age. An abstract of the information is shown in Figure 9 below.

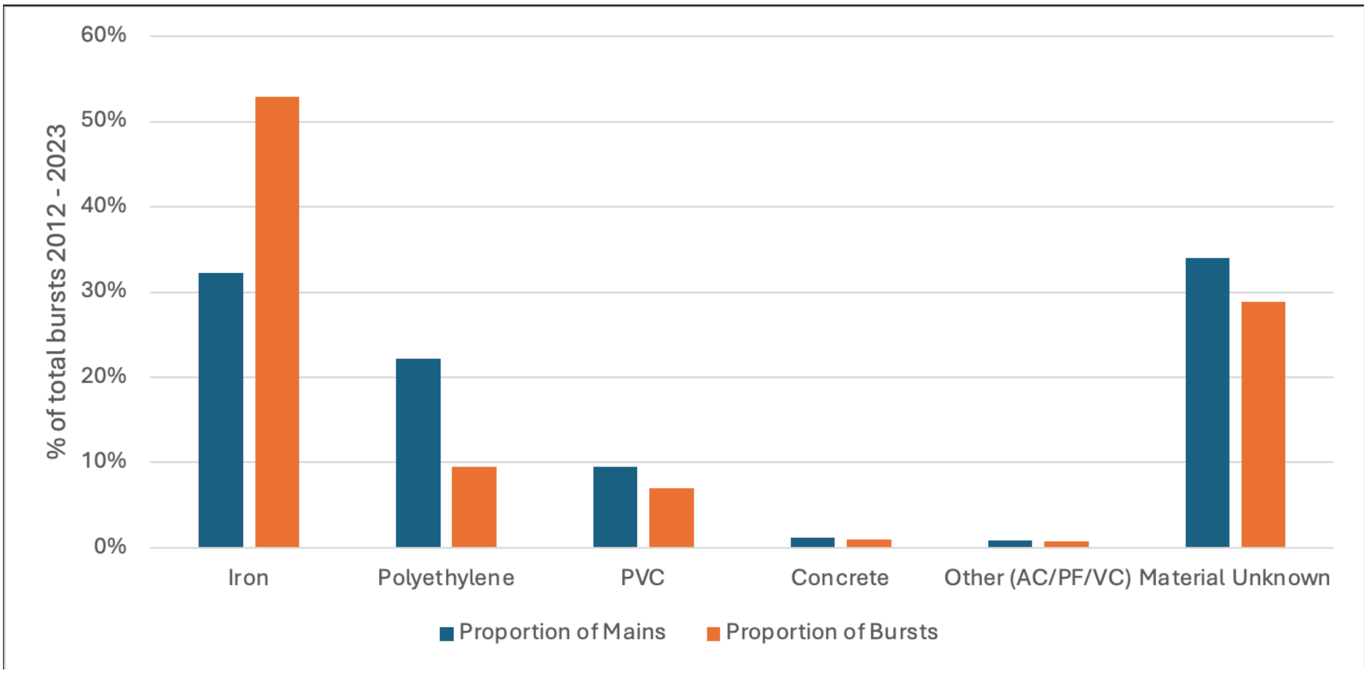

Figure 9: Waste water sewers burst data plotted against material - proportion of pumping mains and proportion of bursts by material

The relationship between asset age and burst frequency is not pronounced. Older assets (installed prior to 1979) are contributing a slightly higher proportion of bursts while new assets (installed from 1980 onwards) are contributing slightly fewer bursts in comparison to the number of mains.

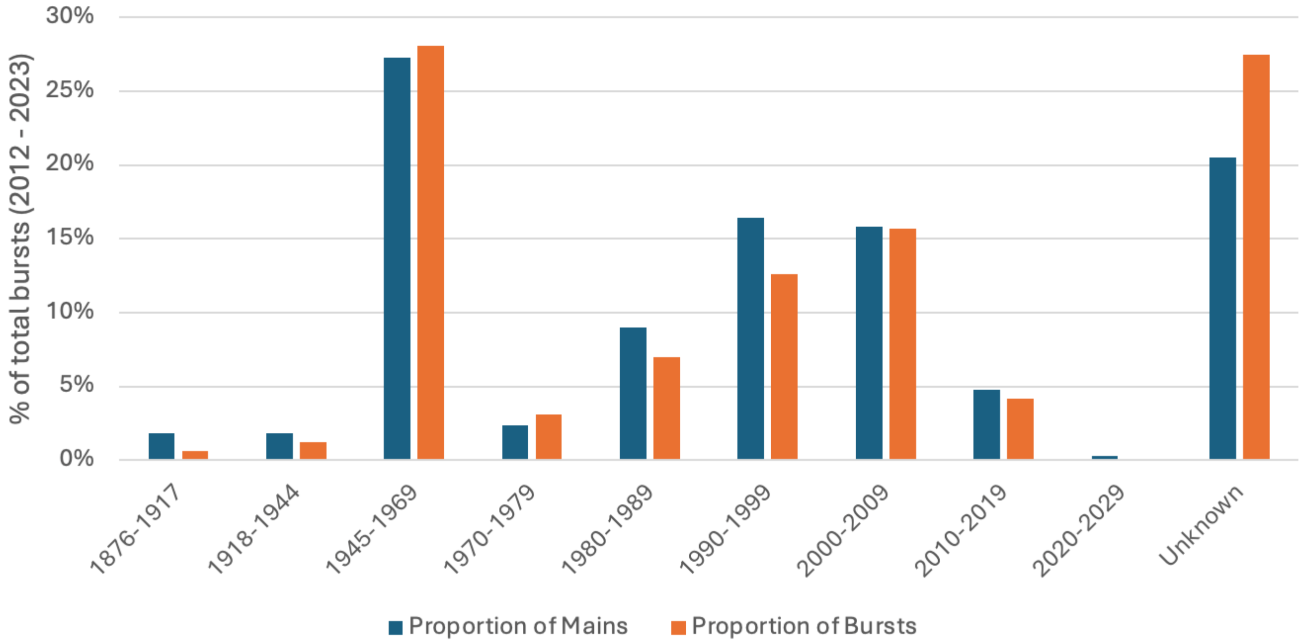

Figure 10: Waste water sewers burst data plotted against asset age - proportion of pumping mains and proportion of bursts by age band

There is also a correlation between past failure history and future bursts. Assets that have burst once are often likely to burst again up or downstream of the original repair, in some cases many more times. Figure 11 shows the proportion of assets that burst more than once, compared with the total number of assets in the burst records. Nearly 30% of assets that have burst once will burst again, with nearly 10% bursting at least five times.

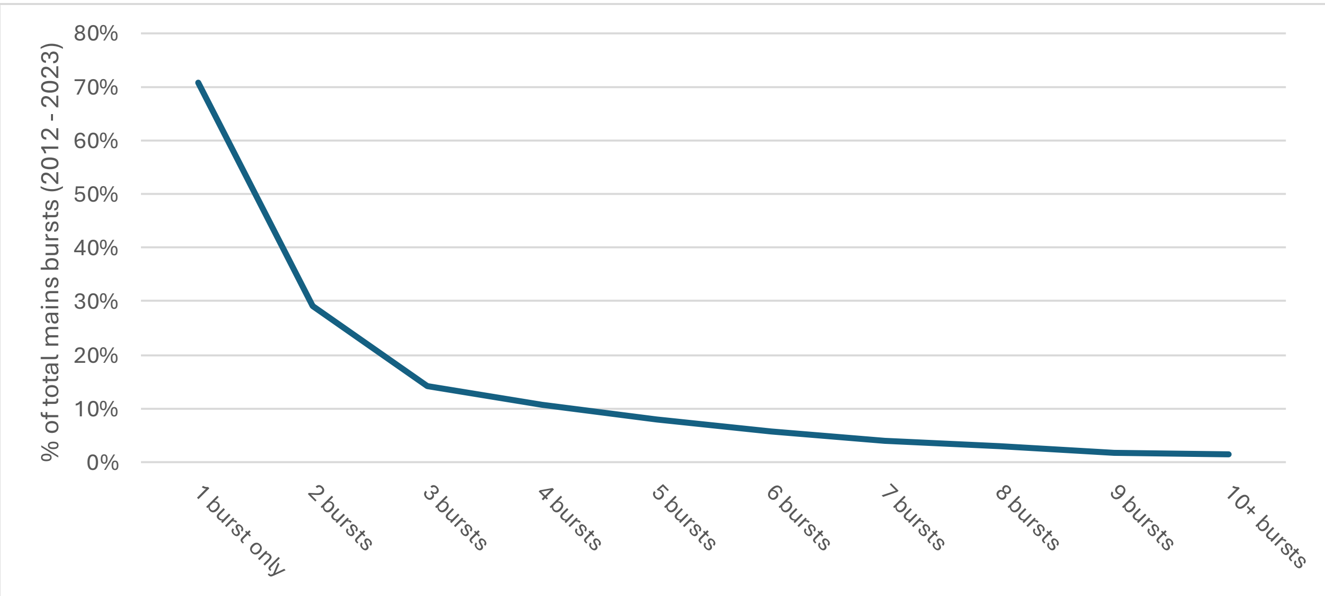

Figure 11: Assets with repeat bursts as a proportion of total assets that have burst at least once

Table 8 provides a correlation between past failure history and future bursts.

Table 8: Condition and burst assumptions by age band used for appraisal purposes.

Age band	<20 years	20-30 years	30-40 years	40-50 years	50-60 years	60-70 years	≥70 years
Assumed condition grade	1	2	2	3	4	4	Failed
Likelihood of burst (first)	Negligible	1%	3%	6%	12%	20%	100%

Based on analysis of the burst data presented above, we have developed a set of assumptions that enable condition and burst likelihood to be linked with age, which is a characteristic we know for a relatively sizeable proportion of pumping mains. Currently Scottish Water does not have a full degradation model for Wastewater pumping mains asset model. Work is proposed to include this within SR27 period

3.3 Block G: Length of Wastewater Sewers (km) by Condition Grade as at 31 March 2033 (No Investment, Asset Deterioration Case Only)

The WWARM model was run with no asset replacement. Taking the total predicted sewer collapses and dividing by the total sewer length gives a coarse view of the sewer condition grade. There was no change in the band Condition Grade 3 (CG3- Collapse average greater than 25 up to 50 collapses/1000km/annum over four years (equivalent to less than 10km down to 5km between collapses over the four-year period). Once we have developed a more refined methodology we would expect this not to change by function but potentially by material type as we could apply different lives to the material types.

3.4 *Block H*: Length of Wastewater Sewers (km) by Condition Grade as at 31 March 2033 (Proposed Investment Case)

DBP Table 3a shows an asset replacement investment of ~£42m (Line 3a.41). This is to address the condition of predicted condition grade 5 critical sewers (circa 50 - 70km) as per the Asset Management Approach MA113. The WWARM model will be run with the SR27 investment for the FBP to see if there is any change to the asset condition grade.

3.5 Accuracy and reliability

The lines in Blocks F, G and H have been given a C6 confidence grade due to the early stage of developing the methodology. To improve the confidence grade, the methodology will be developed from the DBP to the FBP to allow a spread of condition grades and improve degradation rates for each material types. Other improvements such the impact of climate change and assign collapses to the correct pipe material will be undertaken through to SR27. These improvements are captured in Section 3.6.

3.6 Improvement Plan

Draft Business Plan to Final Business Plan

- The sewer collapse methodology will be updated to reflect an improved spread of collapse based on WW catchment zone for all functions (surface water, foul and combined).
- Consider sewer collapse by catchment and material to make the collapse data more granular

Future proposed improvements

A programme of proposed work is being developed, and a high-level overview will be available for the FBP.

- Establish a single source of collapse information that has been assured for use and assigned to a pipe and increase the % of collapse assigned to pipes.
- Improve the process to identify the reason for the failure (material, tree root, 3rd party etc) to improve the collapse model projections.
- Rebuild of the collapse models to consider whether there is suitable data to split by material, but this may not be possible due to the small overall lengths for many of materials. (75% of material is vitrified clay). Include the collapse mechanism (material fail, 3rd party impact, tree root, sub soil undermining) to assess if the collapse was due to a pipe material degradation of environmental conditions
- Update the scenario to include the critical sewer condition grade or pre-selected for replacement (i.e. those that meet the Asset management policy and have been selected for SR27 first) as a constraint to understand the real impact of the planned investment on the collapse rate.
- Develop a new asset degradation model specifically for wastewater pumping mains.
- Re-developing the optimiser to better align with the scenarios to support the Management Approach using material type and function (foul only, combined and surface water).
- Include climate change (soil moisture content, impact of vehicle traffic, different pipe material degradation rates etc) in the models to improve the assessment of collapse.

4 Equipment Health Index

4.1 Background

EHI captures the health of the asset base in the base year (as at 31 March 2025) of the SRC21 period, at end of the SRC27 period as impacted by the asset replacement investment projections proposed in the business plan, and at the end of Scottish Water's Long-Term Investment Strategy (LTIS) period in 2050-51 as impacted by the long-term planned asset replacement expenditure in SRC33, SRC39 and SRC45 periods.

The current asset health is reported for those assets which Scottish Water has relevant information on. Projections for the end of SRC27 and 2050-51 are provided where we have an asset replacement model (referred to as 'modelled assets').

This assessment is being undertaken to understand the potential requirements for asset replacement over SRC27. The data can be used to check whether replacement interventions are keeping pace with deterioration and to determine whether it can provide further insight into emerging asset risks.

Equipment Health refers to the capability of an asset to perform its intended function effectively. It is a conceptualized measure that indicates an asset's overall condition and performance and will help to understand if there is a risk of failure impacting service. Equipment Health is assessed by considering the modes of failure that would affect the value provided by the asset.

The methodology currently employed is based on a United Utilities framework, with Scottish Water developing is through three maturity levels: Basic, Intermediate, and Advanced.

4.2 Assumptions

- Currently EHI is based on the age of the asset (when it was installed) and its expected life in this case for sewers >150yrs and water mains circa 90 - 120yrs.
- For sewers we expect EHI is impacted more by material type than it is function (foul, combines, surface water)
- 80% of sewers do not have a date of install and so an infill methodology has been developed based on post codes and age of properties connected.
- The impact of operation (pressure management, sewer cleaning), climate change, condition or performance is currently not included in the EHI calculation.

4.2.1.1 EHI Bands

Scottish Water's EHI categorises the asset into 1 of 5 groups shown in DBP Table 9 (below).

Table 9: EHI definitions

EHI Band	% of Asset Life Consumed
EHI 1	0 to 65%
EHI 2	66 to 85%
EHI 3	86 to 100%
EHI 4	> 100%
EIH X	Unable to quantify as insufficient data to use or infill

4.2.1.2 Process overview

Figure 12 below shows the high-level process followed.

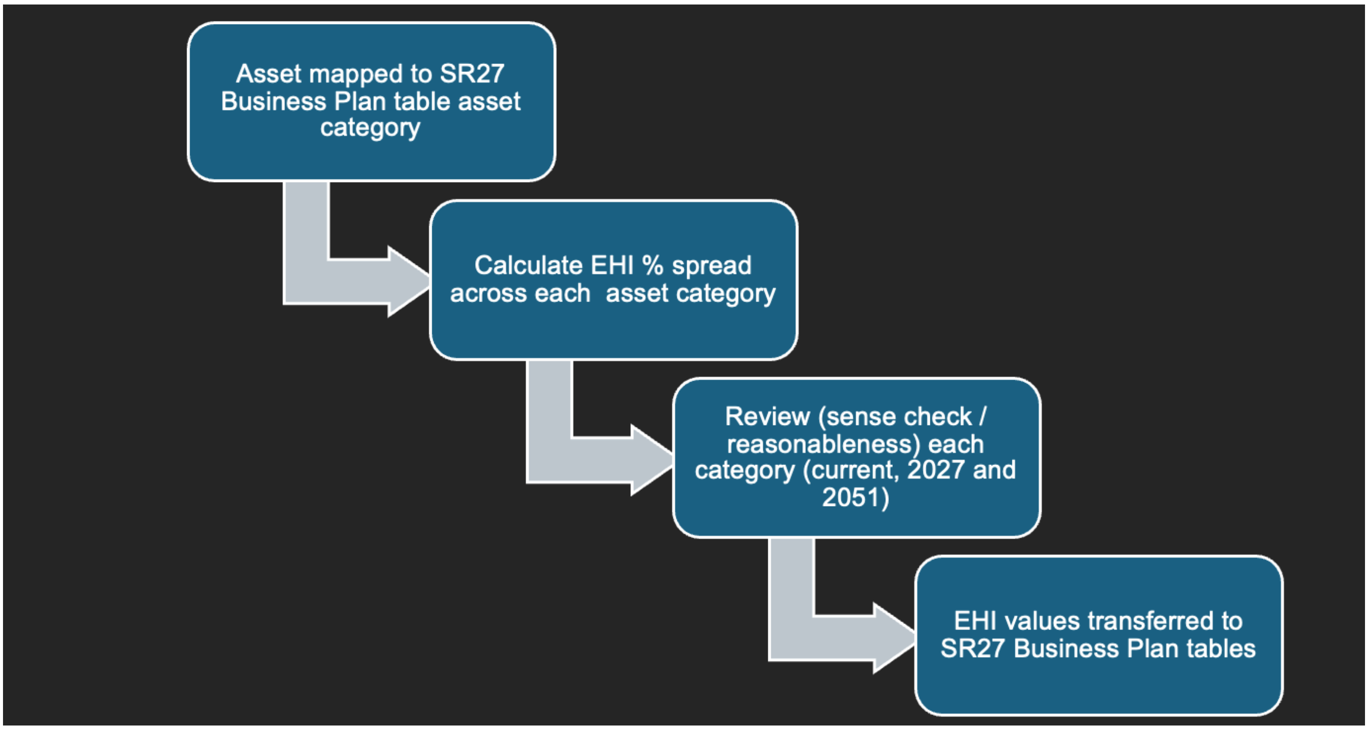

Figure 12 Methodology for Equipment Health Index high-level process flow

4.3 Block D: Length of Water Mains (km) by Equipment Health Index Band as at 31 March 2025

The March 2025 EHI is based on the date of install and the average expected life across the different material types. EHI is based on age only (date of install less the expected average life) for that material type. EHI is presented for Distribution Mains only to reflect the Block A-C information (trunk mains and raw water mains have been removed). There is a discrepancy in the total length between Block A-C and what is reported in Block E-F as the 2 data sets are taken at different points in time and run through different models. This will be addressed for the FBP.

The EHI Basic measure (based on age and expected life only) is producing a similar view of length of main at excellent grade however the spread thereafter is skewed by the age profile of the asset base. As explained in the raw water mains example above - we expect some pipe materials to have different remaining lives depending on when they were installed. This will be included within the EHI methodology for the start of SR27.

Table 10: Summary of length of water mains by equipment health index band as at 31 March 2025

Block D: Length of Water Mains (km) by Equipment Health Index Band as at 31 March 2025			
Line reference	**Equipment Health Index (EHI)**	**Total KM**	**% of water main length in each condition grade**
4.22	EHI 1	**33,063**	73%
4.23	EHI 2	**7,719**	17%
4.24	EHI 3	**2,161**	5%
4.25	EHI 4	**1,709**	4%
4.26	EHI X	**746**	2%
4.27	Total length	**45,398**	

4.4 Block E: Length of Water Mains (km) by Equipment Health Index Band as at 31 March 2033 (Proposed Investment Case)

The Level 2 Water Asset Risk Model (WARM) output was used for the DBP burst table 4 (Block A, B, C) values. In the EHI DBP table 4 (E) the Level 1 asset replacement model used to calculate the water mains replacement lengths for the Long-Term Investment Strategy has been used to project the asset replacement outputs which the EHI projections are based on.

The Level 1 model groups water mains, (raw water, trunk and distribution are excluded for DBP Table 4 (D and E), into Asbestos cement and non-asbestos cement pipe materials only so the forward projection BDP table 4 (E) only shows the AC and other projections. Further granularity will be achieved once the Level 2 and Level 1 models are aligned in SR27.

The projections for AC water mains replacement are derived from the Level 1 model, which was run as an unconstrained replacement plan. The model is age-based and did not identify all the AC mains to be replaced under SR27 or within 24 years. Additional studies on soil type impact and lime leaching from the material walls, which were not reflected in the models, have led to a manual adjustment. This adjustment accounts for the proposed 1350 km reduction of AC mains in SR27. It is a policy aim that no AC should remain in the distribution network by 2051. This goal is incorporated into the Long-Term Investment Strategy and investment assumptions.

The DBP table 4 (E) reflects DBP table Block (C) where the removal of AC will prevent the EHI deteriorating. We will explore between DBP and FDP how the models can better reflect the proposed investment.

Table 11: Summary of length of water mains by equipment health index as at 31 March 2033

Block E: Length of Water Mains (km) by Equipment Health Index Band as at 31 March 2033 (Proposed Investment Case)				
Line reference	**Equipment Health Index (EHI)**	**Total KM**	**% of water main length in each condition grade**	**Change in length between March 2025 and March 2033**
4.28	EHI 1	**31,620**	70%	-3%
4.29	EHI 2	**7,152**	16%	-1%
4.30	EHI 3	**3,601**	8%	3%
4.31	EHI 4	**3,025**	7%	3%
4.32	EHI X	**0**	0%	-2%
4.33	Total length	**45,398**		

There is a general reduction in EHI as the Level 1 model works on age of replacement not on burst rate, which drives the DBP Table 4 (B & C) so there is a discrepancy in how the two tables are calculated. We are looking to address this by SR27 by using the level 2 model outputs for both the burst rate tables (B&C) and the EHI tables.

Table 12: Summary of length of AC water mains by equipment health index as at 31 March 2033

Block E: Length of Water Mains (km) by Equipment Health Index Band as at 31 March 2033 (Proposed Investment Case)				
Line reference	**Equipment Health Index (EHI)**	**AC length (KM) Mar-25**	**AC Length (KM) Mar-33**	**Change in length**
4.28	EHI 1	781	420	361
4.29	EHI 2	4592	2230	2362
4.30	EHI 3	0	1135	-1135
4.31	EHI 4	0	0	
4.32	EHI X	0	0	
4.33	Total length	5373	3786	

The overall length of mains reduction in AC mains (Table 12) is due to the assumption the material will be replaced with PE as we no longer use AC material.

4.5 Block I: Length of Wastewater Sewers (km) by Equipment Health Index Band as at 31 March 2025

As per the Management Approach, repairs are tiggered by collapse or refurbishment or short sections are replaced where an inspection has been undertaken, and the condition of the pipe has been deemed unacceptable and what activity is most economically viable.

- Due to the very long life of vitrified clay pipe sewer pipes there is no impact on EHI over the 6-year period.

- The asset replacement model does not cover the replacement of rising mains, so EHI is showing a deterioration due to time. It is expected a new deterioration model will be available for the start of SR27.
- An expected life of 30 years has been used. This life is under review and will be aligned with DBP Table 3a for the FBP.
- EHI is able to identify the asset function (combined, foul only and surface water only).
- We have manually included investment in SR27 (31km) to start replacing rising mains in line with the asset management approach. We will review the investment designation to replacement and adjustment to EHI for the FBP submission.

The summary Table 13 shows the age of the sewers against their expected life within each EHI band. As expected with an assumed life of >150yrs for vitrified clay the majority of assets sit in EHI1.

Table 13: Summary of waste water sewers by equipment health index as at 31 March 2025

Line reference	Equipment Health Index (EHI)	Total KM	% of sewer length in each condition grade
4.55	EHI 1	34,759	92%
4.56	EHI 2	0	0%
4.57	EHI 3	0	0%
4.58	EHI 4	0	0%
4.59	EHI X	2,840	8%
4.60	Total length	**39,377**	**0**

Sewage pumping mains are called out separately summary Table 14 due to their shorter life as it is operating under pressure.

Table 14: Summary of sewage pumping mains by equipment health index as at 31 March 2025

Line reference	Equipment Health Index (EHI)	Total KM	% of total sewage pumping mains	% of overall DBP Table 4 (I) sewers
4.55	EHI 1	350	20%	1%
4.56	EHI 2	357	20%	1%
4.57	EHI 3	150	8%	0%
4.58	EHI 4	585	33%	2%
4.59	EHI X	336	19%	1%
4.60	Total length	1,778		**5%**

4.6 Block J: Length of Wastewater Sewers (km) by Equipment Health Index Band as at 31 March 2033 (Proposed Investment Case)

Gravity sewer projection

There is no Level 1 model output for sewers as they are considered very long-life assets and as such do not have an asset replacement projection. The Wastewater Asset Risk Model (WWARM) currently provides a forecast of fix on fail activities / investment for gravity sewers not replacement. The DBP table 4 (J) indicates that EHI will not be affected during the SR27 period due to the durability of the Vitrified Clay (VC) pipe material. Table 15 shows that there is no overall change for sewers.

Table 15: Summary of length of wastewater sewers by equipment health index as at 31 March 2033

Block J: Length of Wastewater Sewers (km) by Equipment Health Index Band as at 31 March 2033 (Proposed Investment Case)			
Line reference	**Condition Grade (CG)**	**Total KM**	**% of sewer length in each condition grade**
4.61	EHI 1	34,759	92%
4.62	EHI 2	0	0%
4.63	EHI 3	0	0%
4.64	EHI 4	0	0%
4.65	EHI X	2,840	8%
4.66	Total length	37,599	

Sewage pumping main projections

There is no Level 1 model asset replacement output for sewage pumping mains and as such they do not have an asset replacement projection. Sewage pumping mains have a different age and degradation to gravity sewers and so are not included in the WWARM analysis. A separate deterioration model for sewage pumping mains is planned to be developed for SR27.

The DBP table 4 (J) shows an additional 6-year life added to all the assets lives (ie the assets are projected to get 6yrs older with no asset replacement projected). Table 16 summarised the impact in the variance column. Within condition grade 4 (CG4) deterioration in the sewage pumping main age moves from 33% to 50%. It is noted that in line 3a.32 (DBP Table 3a) there is a forecast replacement of £87m ~31km (2%) of the asset stock and part of the £141m detailed in the Managing Quality of Flows Technical appendix Section 4. This investment (as part of the Asset management approach policy - Wastewater pumping mains (MA012) will start to address the assets that have the higher number of bursts.

Table 16: Summary of length of wastewater sewers by equipment health index as at 31 March 2033 based on increasing age by 6yrs.

Block J: Length of Wastewater Sewers (km) by Equipment Health Index Band as at 31 March 2033 (Proposed Investment Case)				
Line reference	**Condition Grade (CG)**	**Total KM**	**% of sewage pumping mains length in each condition grade**	**Variance March 25 to March 33**
4.61	EHI 1	166	9%	-10%
4.62	EHI 2	140	8%	-12%
4.63	EHI 3	251	14%	6%

4.64	EHI 4	885	50%	17%
4.65	EHI X	336	19%	0%
4.66	Total length	1,778		

4.7 Additional analysis

As part of developing the EHI tables for the DBP we undertook additional analysis. Below are some examples that once developed in EHI (intermediate) will help support some of the investment narratives. Between DBP and FBP we plan to have the trunk mains, raw water mains, sewers (by material type) and sewage pumping mains (by material type) available using EHI Basic (age only). If this information would be helpful, we can discuss if the information should be included in the FBP.

4.7.1 Trunk mains

The Level 1 asset replacement model provides a view of replacement by age as to when the trunk mains should be replaced, broken down into AC and non-AC material. We will be developing a degradation model similar to distribution mains to allow us to provide projections by material type for SR27. We have developed our EHI basic methodology to separate out trunk mains and will be refining the expected lives based on the work conducted in the Asset Management approach over the last 6 months.

4.7.2 Gravity sewers

Information of Sewers has been requested by function (Combined, foul only and surface water only). We have started to break our wastewater infrastructure out by material type (as water distribution mains). While not currently informative regarding sewer collapse due to the longevity of Vitrified Clay pipes, we did break the EHI out by material type. Our next step between DBP and FBP is to apply different lives for the various materials so we can support the Management approach decision making process. The information by material type (for March 2025 table only) could be provided as part of the FBP if requested.

4.7.3 Wastewater Pumping mains

In the EHI table Block I and J there is one column (9) that identifies sewage pumping mains. As part of preparation work, we looked at different pipe material types and the impact of EHI across critical and non-critical wastewater pumping mains. Once the condition grade and other factors such as performance (burst rates) are included within EHI it will provide a more useful measure to assess the assets.

4.8 Accuracy and reliability

EHI scores have been given a confidence grade of C5. This judgment is based not only on the data currently available but also the methodology used which is at the ‘Basic’ maturity level. Once validated date of install, condition and other factors are included, the confidence scores will be revised. As laid out in the Capability Improvement annex of the Investment Planning technical appendix we anticipate having 10 management approach areas improved by the start of SR27 and then the remaining areas complete in SR27.

There is a discrepancy between the length (5759km 18%) of sewers used in DBP Table 4 Block F – H and that used in Block I and J. The reason is a different methodology for how sewer is recorded in GIS (lateral, gravity sewer, surface water, foul only etc.) and what is used in the degradation model and EHI. This will be addressed for the FBP submission.

4.9 Improvement Plan

4.9.1 Draft Business Plan to Final Business Plan

A maturity journey has been set out in the data improvement plan covered within the DBP submission. The proposed improvement between DBP and FBP will be:

- Refresh the Asset inventory to reflect AR25.
- Fix the EHI score at April 2025 to reflect the asset register snapshot.
- Improved infill methodology to be applied to missing date of installs There is expected to be data improvement in the corporate systems that will reduce the EHI X (improved date of install, material type for missing date of installs).
- The 2025 annual return (AR25) asset register will be used to run the asset replacement projection again. EHI will be updated for its future projections. This will revise the March 2033, and 2051 Level 1 projections based on the revised asset register for April 2025 and the funding projection.
- As part of the data improvement proposal, we plan to improve the knowledge of material type and assess how condition of the rising mains can be utilised in the EHI assessment

Table 5: Projects and Programmes

Commentary

Contents

1 Background

1.1 Purpose

Table 5 provides cost and output data on Scottish Water's proposed projects and programmes of work over the SRC27 period.

At draft business plan stage this should be considered as our initial view of an evidence-based, forward-looking plan for investment projects and programmes. However, given the current low maturity of the majority of projects included in SR27, our focus has been on providing realistic forecasts of overall investment and output profiles at the levels of granularity requested in Tables 2 and 3a. While Table 5 provides the requested detail of current demand assumptions behind our investment requirements, individual project and programme cost, date and output forecasts will be subject to significant change as our plan develops and should not be considered as commitments suitable for baseline monitoring at this stage.

We will continue to develop the maturity of our projects and programmes with a view to a performance baseline for SR27 being based on our AR27 submission, as previously agreed. By that time, we will have been able to engage our new SR27 supply chain delivery partners in developing more robust project and programme level milestone schedules and investment profiles, with greater consideration of delivery risks, efficiency and supply chain capacity and sustainability issues included in our forecasts.

In addition, we will continue to develop investments through our project lifecycle stage and gate processes, with an increasing number of projects continuing to be added to our "Committed List" with costs and delivery milestone dates, following Gate 90 approvals.

"*This data will provide a baseline for monitoring the delivery and outturn performance of these projects and programmes, which will ultimately benefit Scottish Water customers. It will also inform the baseline that WICS will assess Scottish Water's performance against over the SRC27 period (and that Scottish Water will report against), recognising that the investment programme will change as investment progresses through the Scottish Government Investment Group (SGIG) process.*" WICS Business Plan Guidance and Definitions[1]

1.2 Overview

Table 5 provides the baseline data for projects and programmes of work over the SR27 period. Table X is the supporting table used internally in Scottish Water to populate and ensure consistency across various data tables within the business plan submission, which has been provided separately to WICS.

Table X provides a detailed breakdown of all project and programme investments at a more granular level than that requested in Table 5. Each entry contains a specific reference code, which allows for the capture of project splits across multiple investment drivers and enables the identification of projects delivering more than one output type.

[1] https://wics.scot/system/files/2024-12/SRC27-Business-Plan-Guidance-and-Definitions.docx

Within Table X, columns additional to those required in Table 5 are included to enable the mapping of various attributes associated with each unique reference code to the correct investment lines in Tables 5 and then on to Table 2 for Enhancement and Growth investments and Table 3a for Maintenance (AR3) investment. This mapping is outlined in Figure 1 below:

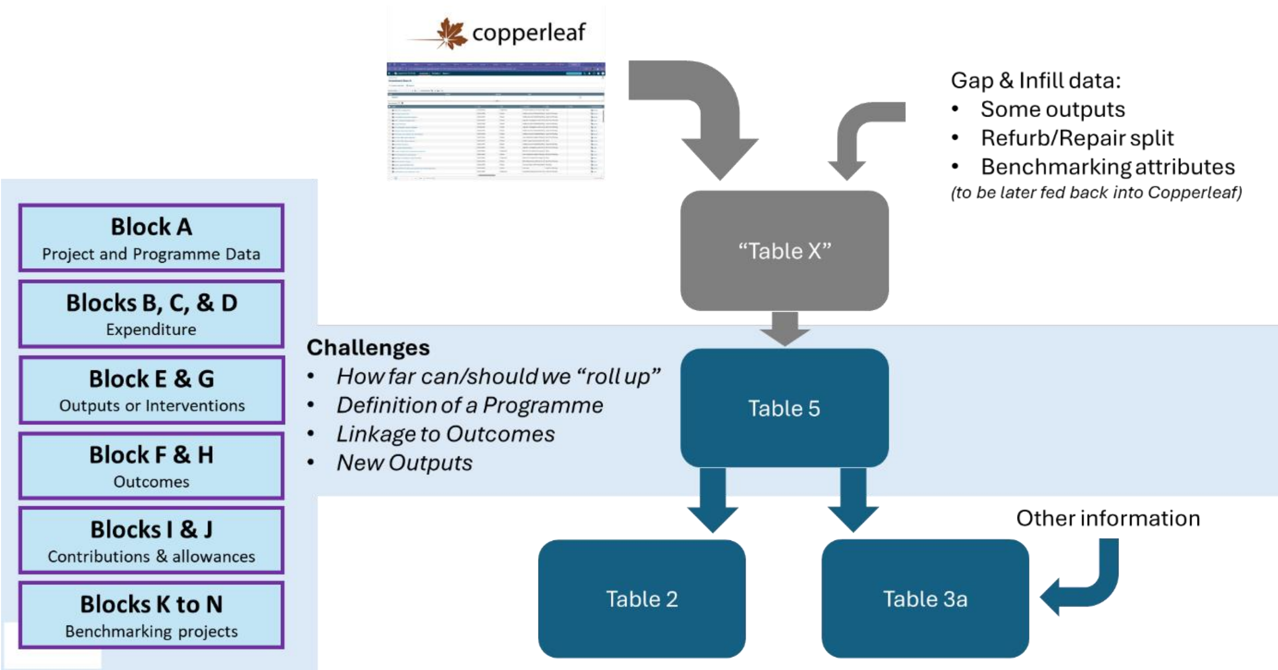

Figure 1: Schematic of Data Mapping between Investment Data Tables

All attribution of investment, outputs and associated phasing is completed in Table X with mapping lookups and formulas set up to enable automated population of the appropriate elements of Tables 5, 2 and 3a. This approach ensures there is no duplication of investment across Tables 2 and 3a and that the overall total value of Table 2 plus Table 3a is equal to Table 5.

The full working input sheet Table X has been provided, from which all the investment and output values in Tables 2, 3a, and 5 are calculated.

Table X data feeds directly to Table 5 using the mapping within Column I "Table 5 Grouping" in Table X.

Table 5 data feeds directly to Table 2 using the mapping within additional Column 139 "Table 2 Row" added to Table 2.

Table 5 data feeds directly to Table 3a using the mapping within additional Column 138 "Table 3a Ref" added to Table 2.

Table 3a data feeds directly to Table 3b using the mapping within Column D "Table 3b Mapping" within Table 3a.

Table 8 is populated directly from table 5 via formulas.

2 Considerations

2.1 Reporting expenditure

For the draft Business Plan all investment values have been presented in 2023-24 prices, in £m to 3 decimal places.

Table 5 also includes the required conversion to Outturn prices in Block C, using latest RPI/CPI inflation indices.

Annual investment profiles have been provided for each year of the SR27 period. Where project specific costs span over from the SR21 regulatory control period these have been summarised in the pre-SRC27 columns in Table 5.

For Draft Business Plan (DBP) we are unable to show any project level investment impacts in SR33-45 from SR27 projects. This is due to the current lack of maturity of projects that will not be completed within the SR27 period, both in terms of costs and timescales for delivery. Greater definition of impacts on SR33-45 will develop as we progress projects throughout SR27. Further information is available in the Investment Planning Technical Appendix.

2.2 Capital or operating based solutions

All project and programme investment in Table 5 has been classified as capital-based solutions. Operating based solutions are funded separately as Tier 1 investment and are not included within Table 5.

2.3 Grouping asset maintenance projects and programmes

Investment demand in Copperleaf covers both project and programme investment lines.

For the DBP all asset maintenance investment in Table 5 has been identified as programme investment lines. These programme lines align to the 122 asset maintenance Need lines & 56 Management Approaches to which we have allocated asset maintenance funding in SR27.

At Draft Business Plan stage there is limited bottom up SR27 project level costs to break out unit costs by asset size. However, a combination of SR21 actual unit cost and revised unit costs used for MA policy estimates have been used to forecast replacement outputs associated with the AR3 investment lines.

More granular asset maintenance investment demand was input to our Copperleaf system and used as part of our planning considerations. The detailed breakdown of our Need level investment is included within Table X and includes reference to planned and responsive investment demand. For each of our Needs we also have a good understanding of the % split between our planned and responsive investment from our tracking of actual asset maintenance costs within SR21.

2.4 Grouping enhancement and growth programmes

When grouping projects into programmes of work each project must be under £1 million. If an individual intervention asset or site exceeds this threshold it is extracted from the programme and created as a standalone project, this ensures that the correct level of governance can be applied and that unit costs are not skewed by projects of large and small costs being in the same programme.

Within Table 5 all individual investment lines (projects & programmes) are linked to a specific Need and therefore also to a specific Output Type. Programme lines have been developed to aggregate non-contentious or novel projects with costs of less than £6 million, associated with each specific Investment Need as per the WICS Guidance.

Aggregated lines (less than £6 million by investment need) include all projects regardless of current Investment Stage. Details of all projects and their associated maturity stage for each Programme Line are available within Table X.

2.4.1.1 Example – Investment Need 835

Table 5 includes lines associated with External Flooding investment Need 835 as shown in Table 1 below.

Table 1 - Example of External Flooding Need 835

Unique ID	Description	Total in SRC27
P5363110077-835 (Reference) Scenario A	EFOS Emerging Priority Areas	20.883
Under£6M-835 (Reference) Scenario A	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	22.567

1. Unique ID P5363110007-835 (Reference) Scenario A is a programme line for unidentified emerging external flooding priority areas.
2. Unique ID <£6m – 835 (Reference) Scenario A is a Programme line aggregating all named projects in Table X with values < £6m.

Within Table 1 additional granularity is available for the aggregated programme line “Unique ID <£6m – 835 (Reference) Scenario A” (point 2 above).

Table 2 below is an extract from Table X filtered on “Unique ID <£6m – 835 (Reference) Scenario A” in the column Table 5 Grouping.

Table 2 - Table X Extract - External Flooding Need 835

Investment Need	Investment Name	Investment Hierarchy	Need Description	Investment Range	Table 5 Grouping
835	Project not named due to customer confidentiality (Code 5027000000)	Cat 3	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	Under £3m	<£6m-835 (Reference) Scenario A
835	Project not named due to customer confidentiality (Code 5240730000)	Cat 3	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	Under £3m	<£6m-835 (Reference) Scenario A
835	Project not named due to customer confidentiality (Code 5035520000)	Cat 3	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	Under £3m	<£6m-835 (Reference) Scenario A
835	Project not named due to customer confidentiality (Code 5240740000)	Cat 3	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	Under £3m	<£6m-835 (Reference) Scenario A
835	Project not named due to customer confidentiality (Code 5441760000)	Cat 3	To reduce flood risk to customers impacted by repeat high consequence external sewer flooding where not disproportionately expensive	Under £3m	<£6m-835 (Reference) Scenario A

In the above example there are 5 named projects that contribute to the aggregated programme line.

3 Projects for Benchmarking

Projects that can be used for benchmarking have been excluded from the grouping process set out above to ensure that they are all visible in Table 5.

Any Projects which relate to the following Investment Needs have been included within Table 5 and tagged appropriately against the relevant columns in blocks K to N in Table 5.

N953 - Phosphorus, BOD and ammonia impact to be reduced at WwTWs where impact has been confirmed. (Phosphorus removal projects – Block K).

N957 - Reduce the risk of environmental pollution from CSOs - Develop solutions to priority UIDs (catchments to be agreed with SEPA) for aesthetics (Storm Overflow projects – Block M).

N3287 - Reduce the risk of environmental pollution from CSOs - Develop solutions to priority UIDs (catchments to be agreed with SEPA) for water quality (Storm Overflow projects – Block M).

N2843 - Enhancing network supply capability. (Water Resources – Block N)

N2845 - Increase the availability of water to meet strategic growth requirements - Water. (Water Resources – Block N).

N3281 - Improve resilience of water supply systems to enable them to provide continuous water supplies. (Water Resources – Block N).

Projects can be identified as fitting into one of these categories in pre-development (Gate 30) but availability of additional attribute information requested in Blocks K-N will not start to come through until projects move into Investment in-development/pre-commitment (Post Gate 50) phase. This detail is not available currently but may start to become available for the FBP submission.

4 Proportional allocation of expenditure

Allocation of all investment lines within our investment planning tool Copperleaf and our investment management tool P3M is consistent in that all investment is allocated against the appropriate Investment Need line(s) that relate to the investment driver for the projects or programmes. Where a project/programme has multiple benefits (e.g. a SEPA driven environmental improvement project also involves replacing existing assets) this will be assigned a need code that relates to the environmental improvement output **and** a need code that relates to the maintenance output. Expenditure will be allocated based on the estimated cost for each activity to the relevant need code – e.g. 1 project made up of 2 needs split 70% of costs to environmental improvement and 30% of costs to maintenance.

Table 3 below provides an extract from Table X for the Dalderse WWTW -Growth project. It shows that the investment has been allocated against 4 different Investment Need lines with a % split allocation adding up to 100%.

Table 3 - Example Table X Extract - Dalderse WWTW

Investment Need	Investment Name	Need Description	Table 5 Grouping	P3M % allocated to need CL
725	Dalderse WwTW - Growth	Maintain inlet works including inlet, screening, grit removal and storm tanks.	AR3-725 (Reference) Scenario A	20%
727	Dalderse WwTW - Growth	Maintain primary treatment including tanks, wet well, pumps, instrumentation, control & monitoring, buildings, screenings, cranes, sampling	AR3-727 (Reference) Scenario A	30%
729	Dalderse WwTW - Growth	Maintain secondary treatment including tanks, septic tanks, activated sludge assets, wet well, instrumentation, BAF filter, reed bed	AR3-729 (Reference) Scenario A	30%
811	Dalderse WwTW - Growth	Confirmed development in catchments which require investment	P5363112894-811 (Reference) Scenario A	20%

For the Dalderse WWTW – Growth project 3 of the 4 lines are associated with AR3 Needs and for these lines Table 4 includes a further % split of this investment against Replacement and Repair & Refurbishment as shown in Table 4 below.

Table 4: Investment split between replacement, repair and refurbish

Investment Need	Investment Name	P3M % allocated to need CL	Allocation of expenditure to maintenance: replacement (%)	Allocation of expenditure to maintenance: repair & refurbishment (%)	Allocation of expenditure to enhancement (%)	Allocation of expenditure to growth (%)
725	Dalderse WwTW - Growth	20%	79%	21%	0%	0%
727	Dalderse WwTW - Growth	30%	47%	53%	0%	0%
729	Dalderse WwTW - Growth	30%	61%	39%	0%	0%
811	Dalderse WwTW - Growth	20%	0%	0%	0%	100%

The % split between asset replacement & repair/refurb has been applied consistently at an AR3 Need level rather than being project specific based on intelligence provided from either historic SR21 cost splits or bottom up SR27 demand information dependent on confidence gradings.

This approach, of allocating and tracking capital expenditure by Investment Need enables accurate investment categorisation into the correct columns within tables 5, 2 and 3a.

The overall % split assumption has been calculated as follows:

- Replacement – 51% £2,545.899m
- Repair & Refurbishment – 49% £2,415.325m
- For SR27 the overall 49% repair and refurbishment expenditure split has an indicative split assumption as follows:
- Repair – 39%
- Refurbishment – 10%

4.1 Climate Change Mitigation and Adaptation

As was noted in Scottish Water's response to the WICS Draft Methodology, and flagged to WICS ahead of DBP submission, fully disaggregating the proportion of spend that relates to climate change mitigation and adaption will require further development ahead of the FBP submission. We are keen to ensure that any line-by-line approach is sufficiently accurate and reflective. Suitable disaggregated data is not available for submission in the DBP.

The development in this area will continue, with engagement with WICS between DBP and FBP to explain the proposed approach for SR27. It may be the case that an alternative approach, such as aggregated figures or a separate report, would provide more accurate and representative insight into Scottish Water's investment in climate change mitigation and adaption. Further details of our approach to investment in climate change can be found in the Climate Change Mitigation Technical Appendix Climate Change Adaptation Technical Appendix.

4.2 Charge Path Scenarios

Alternative scenarios B and C have been provided as 2 separate tabs within Table 5 and summarised within the relevant columns in Blocks A and B in Table 2 and Block E in Table 3a.

Within Table 5 the unique ID indicates which scenario (A, B, C) the programme/project refers to for example “2252ScenarioC - 2252” relates to scenario C. The expenditure and outputs will either be positive (+) to indicate an additive or negative (-) to indicate subtractive in relation to the reference scenario.

Table 5: Scenario expenditure

		ıpital Expenditure (£m; 2023-24 Pric		
1	2	27	28	29
Unique ID	Description	ʼear 5 031-32	Year 6 2032-33	Total in SRC27
2276Scenario C-2276	Maintain WTW Process Stages Civils - reduction to planned non statutory investigations by 50%	1.222	- 1.285	- 6.777
2300Scenario C-2300	Maintain Wastewater Operational Buildings - reduction to planned non statutory investigations by 50%	0.355	- 0.373	- 1.968
3294Scenario C-3294	Maintain safe access to wastewater operational equipment - reduction to planned non statutory investigations by 50	0.520	- 0.548	- 2.887
811Scenario C-811	No allocation for emerging demand on WWTW (Persley Aberdeem strategy and Nigg excluded)	22.817	- 30.423	- 76.056
837Scenario C-837	A different approach to flooding - Stopping any flooding project pre G70 (continuing with 5363110201, 5363113533, !	42.611	- 53.528	- 198.692
831Scenario C-831	A different approach to flooding - funding reallocated to property level mitigations.	13.538	14.244	75.100
2252Scenario C-2252	No expenditure for renewable energy	3.992	- 4.200	- 22.145

4.2.1 Scenario Overview - Scenario B

CPI + 5 % - Delivering more for customers into the future. £238m increase in growth and enhancement investment and £172m total increase in maintenance expenditure to secure water quality.

Key differences to scenario A is provided in the line-by-line Table 2 commentary and within Table 3a commentary.

4.2.2 Scenario Overview - Scenario C

CPI + 3% - Address the problems we can today. Reduce growth and enhancement investment by £222m by delaying addressing the causes of problems for future customers, introducing more volatility into today's service levels and changing our approach to internal sewar flooding. Reduce investment by £175m by pausing investment in intelligence for good-practice asset management and reducing distribution mains renewal to 250km/yr. Holding recurring customer interruptions stable, not reducing. ITS & burst rates volatile and continuing to trend upward.

Key differences to scenario A are provided within the line-by-line commentary in Table 2, where applicable and within Table 3a commentary.

5 Improvement plans

New investment demand will be taken into consideration where priorities change / if new developments occur.

Profiling of expenditure and outputs has been completed at a high level for the draft business plan submission in order to ensure alignment with the overall funding assumptions for each charge path scenario. For FBP submission we will move towards a more robust bottom up profile for our projects and programmes where possible but detailed project level scheduling involving our SR27 supply chain partners will not be possible until after submission of the Final Business Plan.

Efficiency assumptions have been applied evenly across all projects and programmes, for the Draft Business Plan submission. For the Final Business Plan submission, we will adopt a more targeted approach, identifying specific programmes areas where we will aim to deliver our proposed efficiencies.

Table 6: Transformation Commentary

Contents

1 Background

1.1 Overview of transformation initiatives

In SR27, we are planning for our Transformation programmes to support improvements across six key themes.

1. Procurement DV4 Enterprise Model (Capital and Digital procurement)
2. Standardisation and Lean
3. Digitisation, AI and Automation
4. System Based Approach
5. Asset Risk and Optimisation (ICC to ROC)
6. Partnership Ecosystems (Team Scotland)

Not only do the themes represent those areas necessary for delivering our technology roadmap, but they also represent our largest benefits opportunities.

Although the key themes have been identified, detailed bottom-up financial planning is still ongoing.

As we enter SR27, the Transformation themes will be subject to the current (SR21) governance process before each investment is approved. One element of this governance process that we have more recently developed and implemented is that individual investment cases must meet a defined set of approval criteria, subject to periodic review and refresh as well as having implementation plans in place and a benefits realisation plan to demonstrate the savings, before the delivery phase commences.

As the SR27 portfolio matures, additional opportunities within and beyond the key themes will emerge and be actively explored. those that support our strategy and meet the defined approval criteria will be considered for investment, on a spend to save basis, and will follow the governance process described above.

The total investment cost of the six Transformation themes during the SR27 regulatory period will be £110m. The resultant net benefits of £295m will materially support Scottish Water's ability to meet the cost efficiency totex challenge of 0.8% per year.

2 Capital and Digital Investment

Following the successful introduction of alliances in SR21, core parts of the supply chain will transition to an enterprise model for the SR27 regulatory period. This will bring Scottish Water closer to its supply chain partners, aligning incentives, unlocking opportunities for innovation and improving collaboration. The DV4 enterprise model will deliver savings associated with volume and risk and the unlocking of productivity gains. Improvements elsewhere in the supply chain, predominantly in the extension of the DV2 contract and the Scottish Water General account, will deliver further savings. Digital procurement will also benefit from the introduction of the enterprise model, providing further savings.

2.1 Volume and Risk Costs

The costs associated with embedding the people and processes are £3.5m in year one and £1.8m in year two. Internal costs are based on 9 FTEs in 2027/28 and 6 FTEs in 2028/29 at an average fully burdened employee cost of £70,000 per annum. External spend is based on £2.5m in 2027/28 and £1.2m in 2028/29.

2.2 Productivity Costs

The costs associated with leveraging the new alliances to deliver productivity savings are £9.8m in year one, £7.8m in year two and £6.5m in year three. The costs diminish as the new working practices become business as usual. Internal costs are based on 4 FTEs in 2027/28, 4 FTEs in 2028/29 and 3 FTEs in 2029/30 at an average fully burdened employee cost of £70,000 per annum. External spend is based on £0.5m in 2027/28, £0.3m in 2028/29 and £0m in 2029/30.

2.3 Digital and Other Costs

Digital procurement and other procurement (DV2 extension and SW General) will utilise the new enterprise model, so there will be no costs.

2.4 Total Costs

The total costs associated with implementing the Capital and Digital Investment theme are £29.4m, tapering down from year one to year three (year 1: £13.3m: year 2: £9.6m and year 3: £6.5m). All costs include a Transformation uplift of 5% and a Capital Investment uplift of 7% to cover overhead costs.

2.5 Volume and Risk Benefits

Volume and Risk benefits are dependent on the investment spend rate, as detailed in the reference scenario. The projected savings for the regulatory period are £40.1m, all of which are capex. Figures reflect a 60% risk factor applied to gross benefits.. Benefits are projected to be evenly spread at £6.7m per year, across all six years of the regulatory period.

2.6 Productivity Benefits

Productivity benefits will ramp up year over year as the opportunities created by the new execution model are exploited and then standardised. The projected savings for the regulatory period are £84.0m, all of which are capex. The savings ramp up from £8.0m in year one to £19.2m in year six. Figures reflect a 60% risk factor applied to gross benefits.

2.7 Digital Benefits

Leveraging the new execution model for digital procurement will deliver both opex and capex savings. The benefits shown are based on the digital investment spend rate outlined in the investment scenario. The projected opex savings for the regulatory period are £6.0m, with £1.0m per annum spread equally over six years. The capex savings are projected to be £15.6m, with £2.6m per annum, spread equally over six years. Figures reflect a 60% risk factor applied to gross benefits.

2.8 Other Investment Benefits

As the rest of the supply chain utilises the new execution model (e.g. the SW General account and DV2 extension), further benefits will be realised. The projected savings for the regulatory period are £66.0m, with £11.0m savings per annum, spread equally over six years. All savings are capex. Figures reflect a 60% risk factor applied to gross benefits.

2.9 Total Benefits

The total gross benefits associated with implementing the Capital and Digital Investment theme are £211.7m, with a split of £6.0m of opex savings and £205.7m of capex savings, after applying a 60% Transformation risk adjustment. Capex benefits will be realised by capital investment costs being reduced in relation to the baseline, therefore allowing further investment in projects that were not included within the SR27 baseline. Opex savings will be realised by the tapering of opex budgets through the SR27 regulatory period.

3 Standardisation and Lean

Standardisation is our approach to capturing best practice and embedding repeatability into the design, build, commissioning, maintenance, and operation of Scottish Water's assets. Lean is the application of lean tools and techniques to our products and processes to remove waste. Both of these activities are being implemented in SR21, however the experience gained to date and the introduction of the capital and digital investment execution model both increase the potential for further benefits throughout the SR27 regulatory period.

3.1 Standardisation Costs

In the first two years of the SR27 regulatory period, a dedicated project team will work in an agile team structure to identify and deliver standardisation opportunities. The team will consist of both internal and external resources. The costs associated with this two year ramp up period are £2.0m per year. The project team will disband following year two of the regulatory period as the application of standard products and processes becomes business as usual. The business-as-usual team, which will form in year one and continue throughout the period, will first support the project team, then implement the new ways of working. The ongoing cost of the business-as-usual team, once the project team is disbanded will be £0.5m per year, from year three onwards.

3.2 Lean and Total Productive Maintenance (TPM) Costs

Lean projects will be used to identify and remove waste from our processes. Lean experts will train colleagues throughout the organisation, then mentor them as they deliver local benefits through the implementation of lean projects. The costs associated with providing lean experts is £1.0m per year, across each year of the regulatory period. Internal costs are based on 6 FTEs at an average fully burdened employee cost of £70,000 per annum. External spend is £0.5m per annum, based on current external support costs.

TPM is the application of lean ways of working to reduce the operational costs and capital expenditure associated with operating our assets. The costs associated with providing lean experts to implement TPM across sites is £1.0m per year, across each year of the regulatory period. Internal costs are based on 6 FTEs at an average fully burdened employee cost of £70,000 per annum. External spend is £0.5m per annum, based on pilot study external support costs.

3.3 Total Costs

The total costs associated with implementing the Standardisation and Lean theme are £18.2m. All costs include a Transformation uplift of 5% and a Capital Investment uplift of 7% to cover overhead costs.

3.4 Standardisation Benefits

Standardisation benefits will be realised through time and cost savings within the plan, prepare and deliver phases of specific projects against the investment scenario baseline. The savings will be re-invested in additional projects excluded from the investment scenario baseline. Standardisation benefits have been excluded from Table 6 at this stage while overlaps with other themes, such as capital procurement, are assessed..

3.5 Lean and TPM Benefits

Lean improvement projects will streamline processes and improve productivity by removing inefficiencies. Efficiency benefits are expected to be realised over time through reduced reliance on contractors and natural attrition. The total gross benefits currently reported are £55.0m — comprising £30.8m operational and £24.2m capital savings. .

TPM benefits will be a combination of opex and capex savings, as the cost of responsive repair, refurbishment and replacement and planned asset investments are reduced. The benefits have not been included in Table 6 at this stage, whilst the overlap with asset risk and optimisation is quantified.

3.6 Total Benefits

The total gross benefits associated with the Standardisation and Lean theme are £55.0m, of which £30.8m are Opex and £24.2m are capex savings. These figures reflect only Lean benefits. A 60% risk factor has been applied to gross benefits.

4 Digitisation

Each of the key themes for the SR27 regulatory period will be reliant on digital solutions to unlock benefits. The digitisation theme will deliver digital enhancements that both support the technology roadmap and deliver additional savings.

4.1 Digitisation Costs

For the first three years of the regulatory period, an investment of £6.0m per year has been allocated from the investment scenario to support the other themes with enhanced digital capability and to deliver net benefits. All costs include a Transformation uplift of 5% and a Capital Investment uplift of 7% to cover overhead costs. This investment rate is approximately 50% of the current SR21 investment rate. As previously outlined, individual initiatives will be selected and promoted based on their ability to exceed the financial hurdle rate. Beyond the investment scenario allocation, additional initiatives may be promoted on a spend to save basis and locally funded.

4.2 Digitisation Benefits

Digitisation benefits are expected to come predominantly from savings in capital expenditure. The projected savings assume the £18 million investment is allocated to initiatives expected to meet our defined approval criteria and deliver strong value for money. Gross benefits are currently projected to be £25 million of capital savings. Figures reflect a 60% risk factor applied to gross benefits. This investment also supports enablement of benefits across other Transformation themes.

5 System Based Approach (SIDM)

SIDM has matured our asset management capabilities within the SR21 regulatory period. This system-based approach will continue to mature throughout the SR27 regulatory period. SIDM will support data driven investment decisions prioritised across systems, through the application of our system planning capabilities, supported by Copperleaf.

5.1 System Based Approach Costs

The investment costs associated with SIDM will reduce significantly by the end of the SR21 regulatory period as a sustained level of maturity is reached. The investment costs for the first three (3) years of the SR27 regulatory period will be £3.0m per year. This cost includes 35% contingency and uplifts of 5% for Transformation and of 7% for Capital Investment overheads.

5.2 System Based Approach Benefits

Benefits will come in the form of capex cost avoidance, delivered by making better investment decisions. Total gross savings are expected to be £71.1m over six years, with a 60% Transformation risk adjustment applied. These will be one-time savings associated with specific investment appraisals. This will allow for re- investment into projects that were not included within the SR27 reference scenario baseline.

6 Asset Risk and Optimisation

The Asset Risk and Optimisation theme will leverage the progress made by the Intelligent Control Centre transformation within the SR21 regulatory period. It will deliver benefits through a combination of new ways of working, leveraging technologies, data analytics and insights, developing more proactive capabilities for early identification of service issues, whilst enabling water and wastewater system performance to be better understood and further optimised. Benefits will be delivered predominantly by a reduction in responsive asset replacements, refurbishments and repairs, and deferred asset investment through more advanced operational system planning.

6.1 Asset Risk and Optimisation Costs

Scottish Water will work with a partner to implement the roadmap for Asset Risk and Optimisation, accelerating implementation within the first three years of the regulatory period. The total cost for the period will be £29.4m, with £14.5m in year one and £7.5m in years two and three. Partner costs of approximately £5.6m and internal support costs of approximately £1.4m will be incurred in year one. There will be £22.4m of other costs (including sensor installations, remote access installations and data services) equally spread across years one to three at £7.5m per year. All costs include a Transformation uplift of 5% and a Capital Investment uplift of 7%.

6.2 Asset Risk and Optimisation Benefits

The total gross benefits associated with the Asset Risk and Optimisation theme are £42.0m. The benefits split is estimated to be 10% opex and 90% capex based on current SR21 performance, delivering opex savings of £4.2m and capex savings of £37.8m. Figures reflect a 60% risk factor applied to gross benefits

7 Partnership Ecosystem (Team Scotland)

Changing customer behaviour has the potential to reduce demand on water supply and waste-water treatment. The Partnership Ecosystem will build on the successes of SR21 to engage more with customers throughout the SR27 regulatory period. This will ensure that customers increasingly understand our challenges and support the solutions.

7.1 Partner Ecosystem Costs

For the first three years of the regulatory period, an investment of £2.0m per year has been allocated from the investment scenario to expand the reach and influence of the Partner Ecosystem. Internal costs are based on 9 FTEs for years one to three, at an average fully burdened employee cost of £70,000 per annum. External spend is based on £1.2m in years one to three for consultancy support, events and advertising. All costs include a Transformation uplift of 5% and a Capital Investment uplift of 7%.

7.2 Partner Ecosystem Benefits

Since it is difficult to quantify the potential of this theme at this early stage, no benefits are currently shown in Table 6. As the plans develop, and benefits are identified, they will be included in Table 6.

Table 7: Other Costs and Assumptions

Commentary

Contents

1 Background

1.1 Commentary Content

This report is complemented by the Technical Appendix for Maintaining Financial Strength and the Efficiency Technical Appendix.

It covers:

- Block A: Operating Expenditure
- Block B: PFI Expenditure
- Block C: Other Costs
- Block D: Financial Assumptions
- Block E: Property/Population Growth Assumptions

The tables have been prepared in line with the requirements set by WICS.

1.2 WICS Requirements

The following requirements have been taken from the WICS Business Plan Guidance and Definitions[1]

- The table covers Scottish Water's operating expenditure (OPEX) forecasts, population and growth forecasts as well as a number of other financial assumptions and costs. The data required is forecast annually over the SRC27 period and then in the final year of each subsequent regulatory control period – i.e., 2038-39, 2044-45 and 2050-51.

- This will allow for assessment of the OPEX aspects of the business plan, in relation to changes from the base position in 2024-25. It will also inform the baseline against which WICS will assess Scottish Water's OPEX performance over the SRC27 period.

1.3 Overview

To establish our forecast for operating expenditure (Block A) and other costs (Block C) we have gathered information using available forecasts within Scottish Water and tested these against external assumptions where these are available. In addition, internal challenge sessions were held with senior leaders to test the assumptions used within the business plan.

Scottish Water's performance against the Final Determination over the SRC21 period (2021-27) is disclosed within its Annual Report and Accounts (Performance and Prospects) within the financial sustainability section (pages 51 – 55). Detail on our efficiency assessment is set out in the Efficiency Technical Appendix.

Operating expenditure forecasts have been prepared with the application of the revised Regulatory Accounting Rules (RARs) ensuring that the figures in 2024/25 are consistent with the reporting in our Annual Return (AR25).

Forecasts for PFI expenditure (Block B) are based on PFI sites returning to Scottish Water operations as the contracts mature. Given the commerciality of the contracts between Scottish

[1] https://wics.scot/system/files/2024-12/SRC27-Business-Plan-Guidance-and-Definitions.docx

Water and the relevant PFI entities we have estimated the operating costs using the best information available.

Forecasts for financial assumptions (Block D) are based on long term assumptions of inflation which we anticipate varying during the control period.

Forecasts for property / population growth assumptions (Block E) have been informed both by actuals over this regulatory period and using publicly available information, specifically the National Records of Scotland (NRS) projections and been applied in a consistent manner to how we report in the Annual Return.

2 Block A: Operating Expenditure

2.1.1 Line reference 7.1 - Base operating expenditure in 2024-25

2.1.1.1 Proposed operating expenditure

Base Operating expenditure is based on our Q3 forecast for the 2024/25 year and amended to reflect forecast Scottish Water non-core expenditure and Cloud computing arrangement costs, consistent with the revised RARs.

A short reconciliation has been provided below to show how we have arrived at the value presented in row 7.1 of block A.

Line description	£m
Forecast Tier 1 operating costs in Q3 Board report (outturn prices)	482.000
Add:	
Forecast Scottish Water non-core operating costs (outturn prices)	2.378
Forecast Cloud computing arrangement costs (outturn prices)	21.000
Total forecast operating costs (outturn prices)	**505.378**
2023/24 price deflator	1.023
Forecast operating costs applied in row 7.1 of block A (2023/24 prices)	**494.016**

Table 1: Forecast operating expenditure costs

2.1.2 Line reference 7.2a - Projected changes due to 25/26 budget and 26/27 adjustment

The values presented in 7.2a represent the following:

<u>2025/26</u>

The adjustment to 2024/25 base operating expenditure of £28.055m reflects the increase to align with the Board approved budget for 2025/26 of £552.2m which converts to £522.071m in 2023/24 prices.

The increase in 2025/26 reflects the following (all in 2023/24 prices):

- An increase in staff related costs related to the increase in employer National Insurance contributions of c. £6m and an increase in the number of people supporting the increasing demands of c. £3m.
- Energy prices are anticipated to increase by c.£4m in 2025/26.
- Cloud computing arrangement costs are budgeted c. £9m higher.
- Other costs and budgeted contingencies relating to potential weather impacts of c. £6m.

<u>2026/27</u>

The adjustment of -£11.529m in 2026/27 mainly reflects cloud computing arrangement costs reducing back to normalised levels.

2.1.3 Line reference 7.2b - Projected changes due to Energy price increases due to end of Purchase Power Agreement (PPA)

Over the SR21 period around half of Scottish Water's electricity requirement is purchased through a long-term power purchase agreement (PPA). This agreement expires on 31st March 2027. Since the energy crisis the agreed PPA has allowed Scottish Water to benefit from a c. 40% reduction on electricity compared to market prices. Based on forward market prices relative to the price set in the power purchase agreement, electricity costs are forecast to increase by £11.846m (£13.1m in outturn) in 2027/28.

Market prices remain volatile and are difficult to predict. To forecast market prices, we use the average predictions of two independent consultants.

Throughout the remainder of the period, we have projected that electricity costs will increase in line with CPI.

2.1.4 Line reference 7.2c - Projected changes due to Bad debt

The household collection rate is just under 97%. We have assumed that overall collection rates will remain steady over the 2027-33 period and hence the bad debt charge will increase each year, in line with the annual price profile of CPI + 4% p.a. To model this we have assumed an outturn increase of £1.1m p.a., which is CPI+4% multiplied by our bad debt charge in 2024/25 of £19m.

Beyond the 2027-33 period we anticipate that bad debt charges will continue to increase in line with household charges.

2.1.5 Line reference 7.3a to 7.3g – Projected additional costs of operating returning PFI sites

In our plan we have forecast that all PFI sites will return to Scottish Water at contract expiry. Based on our experience of the returning Highland and Aberdeen PFI sites, we estimate that operating these sites within Scottish Water provides the best value for our customers as we expect to operate the sites at a lower cost when compared to the current service fee under the PFI contract.

To estimate the cost of operating the returning PFI sites we have undertaken a detailed analysis of each site based on available information and at cost category level (e.g. employment costs, chemicals, power etc). Where no information is available, we have used estimates.

For each returning PFI site we have tested the analysis against the service fee, currently paid to the PFI concessionaire. The table below shows, by PFI site, the return date at contract expiry and the corresponding proportion of annual service fee we expect to incur to operate the PFI sites after their return:

PFI site	Return date	Estimated proportion of annual service fee to operate

Daldowie	01 April 2026	88%
Dalmuir	15 June 2026	64%
AVSE	29 April 2029	61%
Tay	16 December 2029	28%
Moray	25 June 2031	46%
MSI	29 September 2032	63%
Levenmouth	30 October 2040	50%

Table 2: Estimated proportion of annual service fee to operate PFI site

Further detail on each of the sites above is explained in the relevant sections below with corresponding reductions in service fee shown in Block B.

2.1.6 Line reference 7.3a - Projected additional costs of operating the returning PFI - Daldowie

Daldowie PFI is a sludge treatment centre which is fed via a sludge pipeline from 6 major wastewater treatment works in Greater Glasgow. The current PFI contract ends on 1 April 2026, resulting in additional operating expenditure in 2026/27 of £25.179 m (representing 364 days) and in 2027/28 an additional £0.071m (representing 1 day). Both convert to £23.223m and £0.064m respectively in 23/24 prices.

We have estimated that we will be able to operate the site for c. 88% of the annual service fee at contract expiry. A significant proportion of the ongoing cost after expiry relates to the volume of gas used at the site. Daldowie currently uses a gas drying technology to process the sludge it receives into waste derived fuel pellets. The table below shows the proportion of annual operating cost by cost category:

Cost Category	Proportion of annual operating costs
Gas	33%
Staff Costs	29%
Electricity	16%
Other costs including business rates	11%
Tank Cleaning & Waste Disposal	4%
Chemicals	4%
IT and licence costs	3%

Table 3: Daldowie operating cost by cost category

Since finalising the numbers for the Draft Business Plan, specialist testing of the fossil fuel element of the dried sludge fuel pellets has increased the estimated cost of disposal of these pellets by £0.3m p.a. This will be updated in our Final Business Plan.

2.1.7 Line reference 7.3b - Projected additional costs of operating the returning PFI - Dalmuir

Dalmuir PFI is a wastewater treatment works and is the third largest treatment works in Scotland, treating a catchment of c 550,000 PE. The current PFI contract ends on 15 June 2026, resulting in additional operating expenditure in 2026/27 of £13.040m (representing 289 days) and in 2027/28 an additional £3.532m (representing 76 days). Both convert to £12.027m and £3.194m respectively in 23/24 prices.

We have estimated that the ongoing cost to operate the site is around 63% of the annual service fee at contract expiry. Due to the size of the PFI site relative to the population served there is significant use of chemicals, particularly ferric. A breakdown of the proportion of forecast annual operating costs is provided below:

Cost category	Proportion of annual operating cost
Electricity	31%
Chemicals	22%
Employment costs	19%
Sludge disposal	13%
Business rates	5%
Contractor costs	4%
Other costs (SEPA, Rates, supplies)	6%

Table 4: Dalmuir operating costs by cost category

2.1.8 Line reference 7.3c - Projected additional costs of operating the returning PFI - AVSE

AVSE PFI covers multiple sites in the Edinburgh and Lothians and includes 5 treatment works, 11 storm water sites, trunk sewers, pumping stations and outfalls. The combined sites serve a PE of c. 960,000 with a contract end date of 29 April 2029. Once returned we expect additional operating expenditure in 2029/30 of £24.975m (representing 336 days) and in 2030/31 an additional £2.220m (representing 29 days). Both convert to £21.706m and £1.892m respectively in 23/24 prices.

We have estimated that the ongoing cost to operate the site is around 61% of the annual service fee at contract expiry. Due to the number of treatment assets operated by the PFI, employment costs make up the largest proportion of operating cost. A breakdown of the proportion of forecast annual operating costs is provided below:

Cost category	Proportion of annual operating cost
Employment costs	29%
Electricity	18%
Chemicals	13%
Business rates	8%
Gas	3%
Sludge disposal	3%
SEPA	2%
Estimated costs where information unavailable	25%

Table 5: AVSE operating cost by cost category

Due to limited availability of operating cost information for this PFI, we have had to use a high-level estimate for c25% of the costs. The value of estimated costs is arrived at after benchmarking against other sites where more information is available. Further analysis will be required in advance of the PFI site returning to Scottish Water and as additional information becomes available.

2.1.9 Line reference 7.3d - Projected additional costs of operating the returning PFI – Tay

Tay PFI treats wastewater at Hatton WWTW (234,155 PE) which is fed by the extensive coastal network of Tayside catchments from west of Dundee to Arbroath including 10 WWPS, CSOs, sewers, extensive pumped mains (40.7km of critical sewer) and associated outfalls. Tay PFI is due to return to Scottish Water on 16th December 2029. Once returned we expect additional operating expenditure in 2029/30 of £2.683m (representing 105 days) and in 2030/31 an additional £6.844m (representing 260 days). Both convert to £2.332m and £5.832m respectively in 23/24 prices.

We have estimated that the ongoing cost to operate the site is around 28% of the annual service fee at contract expiry. A breakdown of the proportion of forecast annual operating costs is provided below:

Cost category	Proportion of annual operating cost
Electricity	41%
Employment costs	23%
Gas	7%
Business rates	4%
Chemicals	3%
SEPA	2%
Rent	1%
Sludge disposal	1%

Cost category	Proportion of annual operating cost
Estimated costs where information unavailable	20%

Table 6: Tay operating costs by cost category

The value of estimated costs is arrived at after benchmarking against other sites where more information is available. Further analysis will be required in advance of the PFI site returning to Scottish Water and as additional information becomes available.

2.1.10 Line reference 7.3e - Projected additional costs of operating the returning PFI – Moray

Moray PFI comprises three separate coastal wastewater schemes each with an extensive system of pump stations (24n WWPS with rising mains, storm storage and outfalls) feeding the three-wastewater treatment works at Lossiemouth (Moray West) (43,928 PE), Buckie (Moray East) (29,008 PE) and Banff MacDuff (12,181 PE). Moray PFI is due to return to Scottish Water on 25th June 2031. Once returned we expect additional operating expenditure in 2031/32 of £5.729m (representing 279 days) and in 2032/33 an additional £1.812m (representing 86 days). Both convert to £4.785m and £1.484m respectively in 23/24 prices.

We have estimated that the ongoing cost to operate the site is around 46% of the annual service fee at contract expiry. A breakdown of the proportion of forecast annual operating costs is provided below:

Cost category	Proportion of annual operating cost
Electricity	26%
Employment costs	21%
Gas	13%
Business rates	6%
Chemicals	5%
Sludge disposal	3%
SEPA	2%
Rent	1%
Estimated costs where information unavailable	23%

Table 7: Moray operating costs by cost category

The value of estimated costs is arrived at after benchmarking against other sites where more information is available. Further analysis will be required in advance of the PFI site returning to Scottish Water and as additional information becomes available.

2.1.11 Line reference 7.3f - Projected additional costs of operating the returning PFI – MSI

Meadowhead, Stevenston and Inverclyde (MSI) PFI comprises three separate treatment works with infrastructure assets limited to the 0.9km Inverclyde outfall. The treatment works combined serve a PE of c387,000. MSI PFI is due to return to Scottish Water on 29th September 2032. Once returned we expect additional operating expenditure in 2032/33 of £7.189m (representing

183 days) and in 2033/34 an additional £7.365m (representing 182 days). Both convert to £5.888m and £5.913m respectively in 23/24 prices.

We have estimated that the ongoing cost to operate the site is around 63% of the annual service fee at contract expiry. A breakdown of the proportion of costs is provided below:

Cost category	Proportion of annual operating cost
Electricity	33%
Employment costs	11%
Gas	9%
Business rates	8%
Chemicals	7%
Sludge disposal	6%
SEPA	3%
Estimated costs where information unavailable	23%

Table 8: MRI operating costs by cost category

The value of estimated costs is arrived at after benchmarking against other sites where more information is available. Further analysis will be required in advance of the PFI site returning to Scottish Water and as additional information becomes available.

2.1.12 Line reference 7.3g - Projected additional costs of operating the returning PFI - Levenmouth

Levenmouth PFI is due to return to Scottish Water on 30th October 2040. Once returned we expect additional operating expenditure in 2040/41 of £6.321m (representing 152 days) and in 2041/42 an additional £9.124m (representing 213 days). Both convert to £4.418m and £6.252m respectively in 23/24 prices.

These figures are based on a high-level estimate, as it is too early to complete a detailed assessment of the likely operating costs. The assumption is that the returning costs will be c. 50% of the service fee. This estimate is broadly in line with our previous working assumptions for the Aberdeen and Highland sites prior to their return to Scottish Water in 2022.

2.1.13 Line reference 7.3h - Projected additional costs of operating the returning PFI – Sludge and land remediation costs.

Due to capacity issues at outlets near to Dalmuir Wastewater Treatment Works, alternative arrangements for the disposal of sludge cake will be needed. It is expected that the additional costs from alternative disposal will be c. £2.000m per annum (£1.808m in 23/24 prices) during the SR27 period.

The estimate is based on 3 separate quotes from potential alternative suppliers and include an estimate of transport costs.

2.1.14 Line reference 7.4a - Projected changes attributed to Enhancement, Growth and Transformation Projects – New operating costs.

The impact of the investment programme on operating costs is forecast to be in line with the historic average of £0.740m in 23/24 prices, which is £4.440m for the period. It is expected that this cost will continue in the next three regulatory periods as well. At present it is not possible to attribute this to project level.

2.1.15 Line reference 7.4b - Projected changes attributed to Enhancement, Growth and Transformation Projects – Non-Household (NHH) Smart Metering impact on operating costs.

The rollout of Smart metering for NHH customers is expected to begin during 2026 (date TBC) and it is assumed a successful rollout will reduce operating costs by £1.500m in 23/24 prices (c£1.760m in outturn) by end of the period. (see Table 9.4 for further information).

	27/28	28/29	29/30	30/31	31/32	32/33	Total
Marginal Cost of Water (£/m3)	0.10	0.11	0.11	0.11	0.12	0.12	
Reduction in consumption in m3 (cumulative)	364,000	3,278,000	6,192,000	9,105,000	12,019,000	14,600,000	
Reduction in cost (cumulative) £m	-0.04	-0.35	-0.69	-1.04	-1.40	-1.75	
YoY reduction £m	-0.04	-0.32	-0.33	-0.35	-0.37	-0.35	-1.8
YoY reduction £m (23/24 prices)	-0.03	-0.28	-0.29	-0.30	-0.31	-0.28	-1.5

The reduction in operating costs is calculated by using our most recent marginal cost of water

Table 9: Expected reduction in operating costs due to smart meter rollout for NHH customers

model, which is expressed in £ per m3 of water and multiplying that by the estimated reduction in water consumption estimated due to the adoption of smart meters for NHH customers. This forms the expected cost reduction and would be seen in reduction of Treatment works operating costs, in cost categories such as chemicals and power.

2.1.16 Line reference 7.4c - Projected changes attributed to Enhancement - Growth and Transformation Projects – Leakage reduction – Project TBC

Additional investment in the SR27 period to support the leakage reduction target is expected to reduce operating costs by £1.701m in 23/24 prices (c£1.981m in outturn) by the end of period.

	27/28	28/29	29/30	30/31	31/32	32/33	Total
Marginal Cost of Water (£/m3)	0.10	0.11	0.11	0.11	0.12	0.12	
Reduction in consumption in m3 (cumulative)	2,737,500	5,475,000	8,212,500	10,950,000	13,687,500	16,425,000	
Reduction in cost (cumulative) £M	-0.29	-0.59	-0.91	-1.25	-1.60	-1.97	
YoY reduction £M	-0.29	-0.30	-0.32	-0.34	-0.35	-0.37	-1.97
YoY reduction £M (23/24 prices)	-0.26	-0.27	-0.28	-0.29	-0.30	-0.30	-1.69

Table 10: Operating cost reduction due to leakage reduction

The reduction in operating costs is calculated by using our most recent marginal cost of water model, which is expressed in £ per m3 of water and multiplying that by the estimated reduction in water production because of increased investment in leakage reduction. This forms the expected cost reduction and would be seen in reduction of Treatment works operating costs, in cost categories such as chemicals and power.

2.1.17 Line reference 7.5 - Efficiency - projected changes to base operating expenditure – 0.8% Efficiency factor on operating expenditure

An overall efficiency factor of 0.8% per annum has been applied to operating costs in line with the efficiency totex challenge for SR27. (see Table 6 and accompanying commentary).

It should be noted that the efficiency factor does not apply to all of our operating costs, as we deem certain costs to be beyond our control. The costs we have excluded from the efficiency factor are detailed in the table below which shows that the resulting efficiency factor being applied to operating costs is 0.66% per annum.

Opex items excluded from Efficiency calc	
XSA0:SEPA	15.02
XYR0:Rates	67.70
XD00:Bad Debts	19.00
Total	**101.72**
Operating Costs 25/26 budget	(522.2)
Opex items excluded from Efficiency calc, as % of Operating costs	-19%
Eff factor	**0.80%**
Reduction in eff factor for exclusions	-0.15%
Revised eff factor	0.66%

Table 11: Efficiency factor

The efficiency factor has the impact of reducing operating expenditure by £21.908m in 23/24 prices (£25.490m in outturn). The cumulative total operating efficiency across the period is £75.92m in 23/24 prices as shown in the table below.

Operating costs	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	**Total**
Baseline OPEX (outturn)	(598.663)	(611.584)	(620.993)	(658.730)	(677.981)	(694.100)	(3,862.052)
Efficiency factor 0.8% but adjusted to 0.66% to exclude SEPA, bad debt, rates (outturn)	3.951	4.036	4.099	4.348	4.475	4.581	25.490
Efficiency in 23/24 prices	3.573	3.578	3.562	3.705	3.738	3.752	21.908
Cumulative efficiency in 23/24 prices	3.573	7.151	10.713	14.418	18.156	21.908	75.918

In the columns beyond SRC27 we have applied the cumulative impacts for the six years to the reference year.

2.1.18 Line reference 7.6 - Efficiency - frontier shift

This line has been left blank as we have included this in line 7.5 above.

2.1.19 Line reference 7.7 - Efficiency - from Enhancement - Growth and Transformation

This line has been left blank as we have applied an overall effect from enhancement, growth and transformation in lines 7.4a and 7.5.

2.1.20 Line reference 7.8 - Total incremental operating expenditure post efficiency

This line is a calculated total.

2.1.21 Line reference 7.9 - Total operating expenditure post efficiency

This line is a calculated total. For years beyond the SRC27 period the values reflect the forecast annual cost for the stated year in 2023/24 prices.

2.1.22 Line reference 7.10 - Difference in operating expenditure - Scenario B

Scenario B is a higher price profile of CPI +5%. This scenario has no impact on Operating expenditure, as the sensitivity of price impacts revenue not operating costs.

2.1.23 Line reference 7.11 - Difference in operating expenditure - Scenario C

Scenario c is a lower price profile of CPI +3%. This scenario has no impact on Operating expenditure, as the sensitivity of price impacts revenue not operating costs.

1.4 Accuracy & reliability

Line 7.1 has been assigned a confidence grade of A1 as it is a forecast figure that has been reported to Scottish Water board.

Line 7.2a has been assigned a confidence grade of B3 as the forecasts have been prepared using our approved budget for 2025/26 and detailed forecast information for 2026/27. We expect these estimates to be accurate to within 10%.

7.2b has been assigned a confidence grade of B3 to reflect volatility in market forecasts for energy prices. The level of volatility has reduced since the energy crisis.

Line 7.2c has been assigned a confidence grade of B3 reflecting our forecast collection rates in 2024/25. We anticipate that bad debts will increase with charge increases throughout the SR27 period.

Line 7.3a and 7.3b have been assigned a confidence grade of B3 because the estimations for Daldowie and Dalmuir are based on a reported actuals and represent a good indicator of future operating costs.

Line 7.3c to 7.3f have been assigned a confidence grade of C3. At the present time there are between 20% to 25% of the running costs of the four returning PFI sites that we do not have visibility of and have therefore used estimates.

Line 7.3g has been assigned a confidence grade of C4 and this is because Levenmouth PFI is not due to return to SW until 2040. The assumption is that the returning costs will be c. 50% of the service fee. This estimate is broadly in line with our previous working assumptions for the Aberdeen and Highland sites prior to their return to Scottish Water in 2022.

Line 7.3h has been assigned a confidence grade of B3. This is based on three quotes from potential alternative suppliers.

Line 7.4a has been assigned a confidence grade of B3 reflecting average historical levels of new opex from the investment programme.

Line 7.4b and 7.4c have both been assigned a confidence grade of C3. The marginal cost of water is accurate but the estimated savings from both the rollout of NHH smart metering and Leakage reduction are less certain.

Line 7.5 has been assigned a confidence grade of B3. This is in line with the analysis done to support the overall efficiency factor of 0.8%.

Line 7.8 has been assigned a confidence grade of C3. This reflects the overall mix of confidence grades for the different changes outlined in Block A.

Line 7.9 has been assigned a confidence grade of C1. This reflects the fact that the majority of expenditure is known and is unlikely to move significantly.

2 Block B: PFI Expenditure

2.1.24 Line reference 7.12 - Base PFI expenditure in 2024-25

For the purposes of the draft business plan the base PFI expenditure is the Q3 forecast of £169.4m for the 2024/25 year. This converts to £165.595m in 2023/24 prices.

2.1.25 Line reference 7.13a to 7.13g - Projected lower PFI fee for the returning PFI Sites

The return of the PFI sites has been covered in an earlier section (7.3a to 7.3g). As the PFI sites return we have estimated that the corresponding PFI service fee reduces to nil for each site as it returns. Where the reduction is shown over a two year period it reflects that the PFI return occurs part way through a financial year and hence the year of return has the part year saving in the first year of return with the balance in the year following return.

Where relevant, in the columns beyond SRC27 we have applied the cumulative impacts for the six years to the reference year. We have used this approach so that line 7.16 reflects the total in year forecast spend in 2023/24 prices.

2.1.26 Line reference 7.13h – Underlying PFI contract inflation

Each PFI contract uses different indices as part of the service fee structure. When reviewing the service fee movements over a long period of time we have typically found that the inflation across all PFI sites when reviewed collectively is broadly in line with RPI inflation. Over the long term RPI inflation has typically been 1% higher than CPI inflation.

As a consequence of inflating PFI service fees at a rate of 1% higher than CPI (assumed at 2% p.a. over the 2027-33 period) and then discounting to 2023/24 prices using CPI we expect to experience real cost increases each year. However, as contracts return over the 2027-33 period, we expect the impact to reduce as PFI fees reduce.

	25/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	SR27 Total
External PFI costs - Inflated by RPI	172.742	178.788	133.696	131.939	135.897	87.932	61.644	50.666	**601.773**
External PFI costs - Inflated by CPI	171.088	177.061	132.398	130.658	134.578	87.078	61.045	50.174	**595.931**
Differential	1.655	1.727	1.298	1.281	1.319	0.854	0.598	0.492	**5.842**
Differential in 23/24 prices	1.565	1.593	1.174	1.136	1.146	0.728	0.500	0.403	**5.087**

Table 12: Inflation impact on PFI costs

In the columns beyond SRC27 we have applied the cumulative impacts for the six years to the reference year. We have used this approach so that line 7.16 reflects the total in year forecast spend in 2023/24 prices.

2.1.27 Line reference 7.14 - Projected changes due to flows and loads

Changes to flow and loads as well as Levenmouth gas indexation and the contractual change associated with the Meadowhead dryers have been included in the financial model as part of the 2025/26 budget and are forecast to form part of the service fees until the return of the PFI sites to Scottish Water.

In the 2027-33 period the impact on PFI Service fees is £0.640m in 23/24 prices. This is broken down as follows:

	25/26	2026/27	2027/28	2028/29	2029/30	2030/31	2031/32	2032/33	SR27 Total
Levenmouth Gas indexation reduction	0.003	0.017	0.017	0.017	0.018	0.018	0.018	0.018	**0.106**
Meadowhead dryer switch-off	-2.552	-0.025	-0.025	-0.025	-0.026	-0.026	-0.026	1.343	**1.215**
Flows & loads reductions	-0.894	-0.326	-0.029	0.008	-0.320	-0.174	-0.075	-0.091	**-0.681**
Total	**-3.443**	**-0.334**	**-0.037**	**0.000**	**-0.328**	**-0.182**	**-0.083**	**1.270**	**0.640**

Table 13: PFI service fees breakdown

In the columns beyond SRC27 we have applied the cumulative impacts for the six years to the reference year. We have used this approach so that line 7.16 reflects the total in year forecast spend in 2023/24 prices.

2.1.28 Line reference 7.15 - Total change in PFI expenditure

This line is a calculated total.

2.1.29 Line reference 7.16 - Total PFI expenditure

This line is a calculated total.

2.1 Accuracy & reliability

Line 7.12 has been assigned a confidence grade of A1 as it is a forecast figure that has been reported to SW board.

Line 7.13a to 7.13g have been assigned a confidence grade of A1 because these costs are known to SW due to payments being contractual.

Line 7.13h has been assigned a confidence grade of A3 because this is an inflation based assumption and reflects a level of uncertainty.

Line 7.14 has been assigned a confidence grade of C5. This is a mix of potential variables including flow and load levels and Levenmouth gas indexation, which remains volatile.

Line 7.15 and 7.16 have been assigned a confidence grade of B3 and B2 respectively. This reflects the overall mix of confidence grades for the different changes outlined in Block B.

3 Block C: Other Costs

2.1.30 Line reference 7.17 - PFI costs

This line is a calculated total, and references Block B.

2.1.31 Line reference 7.18 - Interest

Net interest is calculated within the financial model and is the net interest charge. Net interest charge being interest paid on debt + interest paid on wholesale prepayment less interest received on cash balances.

When we locked down our numbers the forecast National Loans Fund (NLF) rates at the start of the SR27 period were at 4% so this is the assumption used through the SR27 period. The most recent forecasts received indicate an increase of 20 to 30 basis points. We will update our forecasts for the Final Business Plan. Draw down date of debt for the purposes of the calculation is mid-year (30th September) each year. New borrowing is currently assumed at £170m as outlined in the commissioning letter from the Scottish Government.

Interest on wholesale prepaid charges is assumed to be 5%. This rate is based on a margin above SONIA. This rate has in recent history tracked around 1% above the interest rate on new debt, so we have assumed the same for SR27.

Interest received on cash balances is assumed to be 2.44%. This rate has in recent history been between 1% to 2% below the interest rate on new debt, so we have assumed it will be 1.56% below this during the SR27 period.

In the SR27 period interest costs are estimated to be £975.016m in 23/24 prices.

2.1.32 Line reference 7.19 - Taxation

Taxation is calculated within the financial model and is expressed as the current tax payable on the profit and loss statement.

Corporate tax rate is in line with current legislation at a rate of 25%.

Tax is estimated to be £68.110m (£80.5m outturn) over the 27-33 period and is based on the current corporation tax rates and our allocations to capital allowance pools based on historic outturns. Tax legislation can change over the period and if they were to change it would have consequential impact on the tax liability of Scottish Water. The tax allocations and capital allowance pool assumptions have remained consistent for the next three regulatory periods.

2.1.33 Line reference 7.20 - Reasonable Cost Contributions (RCC)

Reasonable cost contributions have been forecast to be in line with current average annual run-rate of £31m in outturn (£30.049m in 23/24 prices). Over the SR27 period RCC payments are estimated to be £180.294m in 23/24 prices. The assumptions have remained consistent for the next three regulatory periods.

2.1.34 Line reference 7.21 - Total other costs

This line is a calculated total.

2.1.35 Line reference 7.22 - Difference in other costs - Scenario B

The difference in other costs for scenario B relates to tax and is an increase on scenario A due to the price profile being CPI+5% i.e. higher, therefore taxable profit is higher. The impact in SR27 would be an increase in costs of £20.263m in 23/24 prices.

For the next three SR periods an assumption has been made that the annual price profile could reduce to CPI+1.8%, which would enable investment funding of c£50bn across SR27 to SR45 in line with SW’s long term investment plan. This price profile would have the impact of increasing tax by £2.791m in year 2038/39 when comparing to Scenario A but then reducing tax in 2044/45 and 2050/51 by £9.325m and £24.376m respectively.

2.1.36 Line reference 7.23 - Difference in other costs - Scenario C

The difference in other costs for scenario C relates to tax and is a reduction on scenario A due to the price profile being CPI+3% i.e. lower, therefore taxable profit is lower. The impact in SR27 would be a reduction in costs of £18.661m in 23/24 prices.

For the next three SR periods an assumption has been made that the annual price profile would need to increase to CPI+3.1%, to enable investment funding of c£50bn across SR27 to SR45 in line with SW’s long term investment plan. This price profile would have the impact of decreasing tax by £2.934m in year 2038/39 when comparing to Scenario A, but then increasing tax in 2044/25 and 2050/51 by £8.483m and £23.011m respectively.

3.1 Accuracy & reliability

Line 7.17 is the same as line 7.16 and has been assigned a confidence grade of B2.

Line 7.18 has been assigned a confidence grade of B2 due to the potential movement in interest rates. However, we would not expect changes in interest rates to materially change our forecast cost due to the proportion of debt that is embedded.

Line 7.19 has been assigned a confidence grade of B3 as changes in tax legislation can occur during the forecast period to 2033.

Line 7.20 has been assigned a confidence grade of B4 and is based on the fluctuation in RCC across the current SR21 period. This cost is driven by demand in housing which we do not influence or control.

Line 7.21 has been assigned a confidence grade of B3. This reflects the overall mix of confidence grades for the different changes outlined in Block C.

4 Block D: Financial Assumptions

2.1.37 Line reference 7.24 - Price profile

The price profile of the refence scenario is CPI + 4% annually. We have assumed CPI at 2%, consistent with the Bank of England target for inflation, so overall the profile is a 6% increase annually.

2.1.38 Line reference 7.25 - Level of borrowing

Total level of borrowing in SR27 is at the levels set out in the Scottish Government's commissioning letter, which is £170m per annum (outturn) and is £872.268m in total for the period, in 23/24 prices.

For the next three SR periods we have estimated that borrowing will be consistent with net new borrowing forecast in the SR27 period of £170m per annum (outturn). Over the period from 2027/28 to 2050/51 this equates to £1,209.162m in 23/24 prices.

2.1.39 Line reference 7.26 - Consumer price index inflation for operating expenditure - Operating expenditure

CPI inflation for operating expenditure in 2025-26 (3.4%) to 2026-27 (2.5%) is as per the February 2025 Bank of England MPC report's forecasts. A planning assumption has been made that inflation will reduce to 2% (as per the current Bank of England target for inflation) and remain at this level for the duration of SR27 and beyond.

2.1.40 Line reference 7.27 - Measure of inflation set out in the relevant contracts for PFI expenditure – PFI.

RPI inflation is used for the forecasting of PFI service fees. The planning assumption is that RPI is 1% higher than CPI, consistent with the long-term average differential between CPI and RPI. Therefore for 2025-26 it is 4.40%, 2026-27 it is 3.5% and for the SR27 period and beyond it is 3% and are based on long-term target CPI inflation targets of 2% p.a.

2.1.41 Line reference 7.28 - Measure of capital price inflation for investment - Investments

COPI has been assumed to be in line with CPI, as per current trend.

4.1 Accuracy & reliability

Line 7.24 has been assigned a confidence grade of B3. The price profile is nominal, so includes a CPI forecast which is uncertain.

Line 7.25 has been assigned a confidence grade of A1. The amounts are set out in the Scottish Government's commissioning letter.

Line 7.26 to 7.28 have all been assigned a confidence grade of B3. As they are all inflation assumptions there is an inherent level of uncertainty in estimating these. They have been based on current forecasts as per Bank of England Monetary Policy Committee reports.

5 Block E: Property/Population Growth Assumptions

2.1.42 Line reference 7.29 - Water billed properties and active supply points - Household billed properties.

The values used for 2024-25 and 2025-26 have been taken from the AR25 A tables line A1.1 and A1.2.

Growth is forecast at 20,000 properties per year for 2026-27 and across SR27. This level of growth is in line with actuals in the first four years of the SR21 period but is higher than the household formation predicted by National Records of Scotland. We consider that given comparable levels of properties per head across similar European countries, household formation alone is likely to underestimate household growth. The yearly variation in new connections is expected to be about +/-10%, reflecting the natural fluctuations in the housing market.

The forecast growth in 2038-39 and 2044-45 of circa 10,000 and 5,000 properties per year respectively is based on NRS Household Projections for Scotland, 2018-based,

for the same periods.

All new properties are assumed to increase both billed and connected property numbers, there is no adjustment for vacant properties.

2.1.43 Line reference 7.30 - Water billed properties and active supply points - Licensed Provider supply points.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables, specifically lines A1.3a, A1.3b, A1.4a, and A1.4b. The property count for billed and connected categories remains consistent because charges are applied to both occupied and vacant properties.

A growth rate of 0.2% is projected for 2026-27 and throughout SR27. The higher growth experienced during the earlier part of the SR21 period resulted from clearance of a backlog of gap sites caused by issues with market processes and incentive schemes (which were reformed in 2020) and resulting from COVID suspensions of field activity. This backlog has now been addressed. Growth in 2024/25 has been negligible at 0.03% but as a single data point is not a reliable basis to forecast forward. 0.2% growth has therefore been used.

The forecast growth in 2038-39 and 2044-45 is 0.1% and further reduced to 0% growth in 2050-51. Growth is projected to decrease over the long term due to the evolving challenges faced by town and city centres, as businesses increasingly shift online, and properties are repurposed to meet changing needs.

2.1.44 Line reference 7.31 - Water billed properties and active supply points - Total billed properties and supply points.

This is a calculated line summing the values in line reference 7.29 and 7.30.

2.1.45 Line reference 7.32 - Water connected properties & supply points - Household connected properties.

The values used for 2024-25 and 2025-26 have been taken from the AR25 A tables line A1.6 and A1.7.

Growth is forecast at 20,000 properties per year for 2026-27 and across SR27. This level of growth is in line with actuals in the first four years of the SR21 period but is higher than the household formation predicted by National Records of Scotland. We consider that given comparable levels of properties per head across similar European countries, household formation alone is likely to underestimate household growth. The yearly variation in new connections is expected to be about +/-10%, reflecting the natural fluctuations in the housing market.

The forecast growth in 2038-39 and 2044-45 of circa 10,000 and 5,000 properties per year respectively is based on NRS Household Projections for Scotland, 2018-based, for the same periods.

2.1.46 Line reference 7.33 - Water connected properties & supply points - Licensed Provider connected supply points.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables, specifically lines A1.6, and A1.7. As above the property count for billed (line7.30) and connected (line 7.33) categories remain consistent because charges are applied to both occupied and vacant properties.

A growth rate of 0.2% is projected for 2026-27 and throughout SR27. The higher growth experienced during the earlier part of the SR21 period resulted from clearance of a backlog of gap sites caused by issues with market processes and incentive schemes (which were reformed in 2020) and resulting from COVID suspensions of field activity. This backlog has now been addressed. Growth in 2024/25 has been negligible at 0.03% but as a single data point is not a reliable basis to forecast forward. 0.2% growth has therefore been used.

The forecast growth in 2038-39 and 2044-45 is 0.1% and further reduced to 0% growth in 2050-51. Growth is projected to decrease over the long term due to the evolving challenges faced by town and city centres, as businesses increasingly shift online, and properties are repurposed to meet changing needs.

2.1.47 Line reference 7.34 - Water connected properties & supply points - Total connected properties and supply points.

This is a calculated line adding values in line 7.32 and 7.33.

2.1.48 Line reference 7.35 - Water population - Household population connected to the water service.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables Line A2.5.

The NRS Projected Population of Scotland: 2022-based forecasts Populations growth at 0.5% for 2026-27, 0.04% for 2027-28, 0.2% per year between 2027-2036, before dropping to 0.1% from 2027-2045 and 0% thereafter have been factored into later years numbers.

2.1.49 Line reference 7.36 - Wastewater billed properties.

The values used for 2024-25 and 2025-26 have been taken from the AR25 A tables line A1.11 A1.12 and A1.25. which include measured, unmeasured household properties, along with household properties billed for surface drainage only.

Growth is forecast to mirror the water bill properties (line7.29) year for 2026-27 and across SR27 with a 0.96 factor applied to reflect the proportion of water only properties with private septic tanks. This is calculated by dividing 2024/25 Line 7.40 by Line 7.32.

The forecast growth in 2038-39 and 2044-45 of circa 9,600 and 4,800 properties per year respectively is based on NRS Household Projections for Scotland, 2018-based, for the same periods.

All new properties are assumed to increase both billed and connected property numbers, there is no adjustment for vacant properties.

2.1.50 Line reference 7.37 - Wastewater billed properties and supply points - Licensed Provider supply points.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables, specifically lines A1.13a, A1.13b, A1.14a, and A1.14b. The number also include surface drainage only supply point too from Line A1.26a (53,086) and A1.26b (8,406).

In line with water billed (line 7.30) and Connected (line7.33) a growth rate of 0.2% is projected for 2026-27 and throughout SR27. The forecast growth in 2038-39 and 2044-45 is 0.1% and further reduced to 0% growth in 2050-51. Growth is projected to decrease over the long term due to the evolving challenges faced by town and city centres, as businesses increasingly shift online, and properties are repurposed to meet changing needs.

2.1.51 Line reference 7.38 - Wastewater billed properties and supply points - Total billed properties and supply points.

This is a calculated line adding values in line 7.36 and 7.37.

2.1.52 Line reference 7.39 - Wastewater billed properties and supply points - Total billed properties and supply points not connected for property drainage.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables, specifically lines A1.21, A1.22, A1.23, and A1.24. which includes both household and non-household property numbers.

This is a subset of the number shown in line 7.37 and 7.41.

The number is largely made up from non-household property numbers, in line with wastewater billed (line 7.30) and Connected (line7.33) a growth rate of 0.2% is projected for 2026-27 and throughout SR27. The forecast growth in 2038-39 and 2044-45 is 0.1% and 0% growth in 2050-51.

2.1.53 Line reference 7.40 - Wastewater connected properties -Household connected properties.

The values used for 2024-25 and 2025-26 have been taken from the AR25 A tables line A1.16, A1.17 and A1.29.

Growth is assumed to mirror the water connected properties (line7.32) year for 2026-27 and across SR27 with a 0.96 factor applied to reflect the proportion of water only properties with private septic tanks. This is calculated by dividing 2024/25 Line 7.40 by Line 7.32.

The forecast growth in 2038-39 and 2044-45 of circa 9,600 and 4,800 properties per year respectively is based on NRS Household Projections for Scotland, 2018-based, for the same periods.

All new properties are assumed to increase both billed and connected property numbers, there is no adjustment for vacant properties.

2.1.54 Line reference 7.41 - Wastewater connected properties & supply points - Licensed Provider connected supply points.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables, specifically lines A1.18 and A1.19. Along with A1.26a and A1.26b

As above the property count for billed (line7.37) and connected (line 7.41) categories remain consistent for the supply point due to charges applied to vacant properties.

In line with water billed (line 7.30) and Connected (line7.33) a growth rate of 0.2% is projected for 2026-27 and throughout SR27. The forecast growth in 2038-39 and 2044-45 is 0.1% and reduce further to 0% growth in 2050-51. Growth is projected to decrease over the long term due to the evolving challenges faced by town and city centres, as businesses increasingly shift online, and properties are repurposed to meet changing needs.

2.1.55 Line reference 7.42 - Wastewater connected properties & supply points - Total connected properties and supply points.

This is a calculated line adding values in line 7.39 to 7.4.

2.1.56 Line reference 7.43 - Wastewater population - Household population connected to the wastewater service.

The values for 2024-25 and 2025-26 have been sourced from the AR25 A tables Line A3.3.

The growth in Household population connected to the wastewater service is assumed to grow at the same rate as household population connected to water line 7.35. Therefore, the NRS Projected Population of Scotland: 2022-based forecasts of growth at 0.5% for 2026-27, 0.04% for 2027-28, 0.2% per year between 2027-2036, before dropping to 0.1% from 2027-2045 and 0% thereafter have been factored into later years numbers.

2.1.57 Line reference 7.44 - Wastewater population - Assumed percentage returned to sewer.

The values for 2024-25 has been calculated from the AR24 A tables, using lines A3.6 - Unmeasured non-household foul volume (including exempt) plus A3.7 - Measured non-household foul volume, divided by A2.9 - Unmeasured non-household volume of water delivered (including losses) plus line A2.10 -measured non-household volume of water delivered (including losses)

	Sewage - volumes		2023-2024	
A3.6	Unmeasured non-household foul volume (including exempt)	Ml/d	13.41	
A3.7	Measured non-household foul volume	Ml/d	136.32	149.73
	Water balance			
A2.9	Unmeasured non-household volume of water delivered (including losses)	Ml/d	17.18	
A2.10	Measured non-household volume of water delivered (including losses)	Ml/d	359.87	377.05
			Assumed RTS	39.7%

Table 14: Assumed percentage returned to the sewer

The step change 2025/26 is due to INEOS reducing water volumes following the closing of the refinery on site. This site has a very small return to sewer percentage but is the largest water user in Scotland. It's projected reduction in water volume (with minimal impact on sewerage) will result in an increase in the overall national return-to-sewer (RTS) %, assumed as 40.7% for 2025-26. The revised RTS is assumed to stay at this level going forward.

5.1 Accuracy & Reliability

The Household billed and connected data in Table 7 has been assigned a confidence grade of B3. The household numbers consist of both unmeasured and metered household data. Unmeasured household data is obtained from local authority corporate systems in various formats. Upon receipt by Scottish Water, the data is standardised using spreadsheets, with minor adjustments made to ensure uniformity across all local authority areas. These adjustments are necessary due to the reporting constraints of certain local authority billing systems. There is an expected annual variation in connections of approximately +/-10% (2,000 connections per year) across SR27. This estimate is supported by housing completion certificates issued across Scotland, which exhibit similar ranges.

The figures reported for non-household properties have been given a confidence grade of B3, consistent with AR25. A confidence grade of B3 is used to reflect the fact that the data is reported from corporate systems but that the ultimate source is external (CMA) systems; and with a reliance on LPs to maintain some elements of the data.

Lines 7.35 and 7.43, which pertain to household populations connected to water and wastewater services, have been given a confidence grade of B2. This grading is due to the age of the NRS source data (2018), the extrapolation of ratios from the WIC4 report to the population data, and the figures across SRC27. Consequently, the accuracy of the numbers may vary by approximately +/-5%.

The ratio of Dwellings with Water to Total Dwellings (from WIC4 data supplied by the local authorities) is applied to the National Records of Scotland (NRS) Private Household Population to give the “Population of Unmeasured Households with Water

Table 9: Enhancement Benchmarking Commentary

Contents

1 Overview

Information in this table has been sourced from data which feeds into the Draft Business Plan (DBP) Data Tables 1-5 or, where relevant, supporting forecasts and analysis to produce them.

The associated econometric benchmarking of enhancement projects required under the Final Methodology is under development following completion of the Data Table. Scottish Water anticipates conducting this analysis following the submission of the DBP with results presented in the Final Business Plan (FBP) submission.

2 Line Commentary

2.1 Block A: Water

2.1.1 Line reference 9.1.a – Leakage activity – Mains replacement (km)

Please note, the primary purpose of this investment is not to reduce leakage, but rather to protect service levels related to water supply interruptions. However, we have tried top provide as much relevant information as possible.

2.1.1.1 Number of interventions

The number of proposed interventions for Mains replacement in SR27 is 1,678km. This data is sourced from Table X which is the source file to Table 5. The needs allocated are 574, 575, SR27008.

2.1.1.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for Mains replacement in SR27 is £495.012m. This data is sourced from Table X which is the source file to Table 5. The needs allocated are 574, 575, SR27008.

2.1.1.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.1.4 Benefits

To derive leakage benefit value from SR27 mains replacement the following calculations were carried out:

- **Step1** – 17 District Metered Areas (DMAs) with more than 50% mains replaced in SR21 were selected. For each DMA in which the scheme took place, the average leakage levels 12 months before a scheme was delivered were calculated and compared with average leakage levels after the scheme was delivered. Only CAT1 DMA leakage data was used (data source: Flow Sense). Based on this analysis it was concluded that on average there was c.20% leakage benefit from mains replacement.
- **Step 2** – To estimate SR27 leakage benefit, 59 DMAs with mains replacement proposed were selected (Data Source RTT Tracker and Copperleaf). These DMAs have either more than 50% rehab proposed or post rehab mains lengths in DMA will mainly consist of plastic mains. For each 59 DMAs average leakage for the period 07/04/2024 - 23/02/2025 was calculated (Data Source: Excel Spreadsheet AR25 P11 DMA Leakage –

DMA Leakage All Tab). To estimate leakage benefit for each DMA, 20% leakage reduction value was applied to the total average leakage in DMA (based on calculations in Step 1).

- **Step 3** - The analysis carried out for the above 59 DMAs was equivalent to c.1,000km of mains proposed to be rehabbed. To calculate SR27 leakage benefit, the total value of leakage benefit was pro-rated against the estimated length of mains proposed for replacement in SR27.

2.1.2 9.1b - Leakage activity - Customer side leakage

2.1.2.1 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for Customer Side leakage in SR27 is £3.688m. This data is sourced from Table X which is the source file to Table 5. The needs allocated is 3277.

No expenditure is included beyond the SR27 period to align with Table 1 outcome profile.

2.1.2.2 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.2.3 Benefits

Benefits are assessed consistent with Table 1 outcomes which require 20Ml/day leakage saving from expenditure on Scottish Water networks and customer leakage combined. Benefit calculated as the pro-rated contribution from expenditure in 9.1b and 9.1c.

2.1.3 9.1c- Leakage activity- Other

The investment in Non-Household (NHH) Smart Metering is not reported here as it is reported in lines 9.4a and 9.4b. It is understood to contribute to a 25Ml/d leakage reduction in the SR27 period due to improved targeting of Tier 1 ALC expenditure.

2.1.3.1 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for other leakage in SR27 is £18.78m. This data is sourced from Table X which is the source file to Table 5. The needs allocated is 3276.

No expenditure beyond the SR27 period to align with Table 1 outcome profile.

2.1.3.2 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.3.3 Benefits

Benefits are assessed consistent with Table 1 outcomes which require 20Ml/day leakage saving from expenditure on Scottish Water networks and customer leakage combined. Benefit calculated as the pro-rated contribution from expenditure in 9.1b and 9.1c.

2.1.4 9.2- Investigations- Studies (Number)

There are no environment studies planned for the water service so no relevant data for Scottish Water to provide for this line.

Specific future investment proposals will require directed study work. This is included as part of the intervention development cost estimates.

Please note, an allocation of circa £50m is included in the SR27 Investment Baseline to deliver waste water linked environmental studies primarily for:

- rUWWTD
- Existing unlicensed dosing
- Climate resilience
- Responsive study needs arising through SEPAs routine regulatory activity.

RBMP4 may require additional study work. Work to deliver against potential future RBMP4 requirements is excluded from our Business Plan as an exogenous risk.

2.1.5 9.3a- Lead communication pipes replaced or relined for water quality (Number)

2.1.5.1 Number of interventions

The number of proposed interventions for communication pipes replaced or relined for water quality SR27 is 18,000. This data is sourced from Table X which is the source file to Table 1. The needs allocated are 652, 654 and 659.

2.1.5.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for communication pipes replaced or relined for water quality in SR27 is £25.898m. This data is sourced from Table X which is the source file to Table 5. The needs allocated is 652, 654 and 659 excluding projects for Larchfield and closedown (circa £3k) of one existing legacy project.

No expenditure beyond the SR27 period to align with Table 1 outcome profile.

2.1.5.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.6 9.3b- Lead- External lead supply pipes replaced or relined (Number)

2.1.6.1 Number of interventions

The number of proposed interventions for external lead supply pipes replaced or relined for SR27 is 250.

Estimate for Larchfield (5363110697) and Gorgie (536110687) projects

2.1.6.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for external lead supply pipes replaced or relined in SR27 is £8.438m. This data is sourced from Table X which is the source file to Table 5 for Larchfield and Gorgie projects.

The full project LBEs have been used which include various elements. The estimated unit rate for the external lead supply pipe replacement is £3,250 and relining has not been considered.

2.1.6.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.7 9.3c- Lead- Internal lead supply pipes replaced or relined (Number)

2.1.7.1 Number of interventions

The number of proposed interventions for internal lead supply pipes replaced or relined for SR27 is 60.

Estimate for Larchfield (5363110697) and Gorgie (536110687) projects.

2.1.7.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for internal lead supply pipes replaced or relined in SR27 is £8.438m. This data is sourced from Table X which is the source file to Table 5 for Larchfield and Gorgie projects.

The full project Latest Best Estimates (LBEs) have been used which include various elements. The estimated unit rate for Internal lead supply pipe replacement is £1,500 and relining has not been considered.

2.1.7.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.8 9.4a- Metering- Total meters installed Basic/AMI/AMR (Number)

2.1.8.1 Number of interventions

The number of proposed interventions for total meters installed Basic/AMI/AMR for SR27 is 4,920.

The figures include both new connection work and the GAP process, which identifies NHH properties that are not currently being charged.

This reflects the normal market churn, assuming it returns to stable levels after peaking at around 2,000 installations per year during Covid 2020/21.

2.1.8.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for total meters installed Basic/AMI/AMR in SR27 is £6.540m.

The costs cannot be directly deduced from entries in Table X.

2.1.8.3 Unit Cost

An allocation has been included to reflect the typical unit rate observed in Unifier, which is approximately £1,400 per installation. This high rate is due to:

a) the extensive geographical coverage of the work; and,
b) the high cost to proactively identify properties without a meter yet requiring one, compared with identifying properties with existing meters to upgrade.

2.1.8.4 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.1.9 *9.4b- Metering- Total meters upgraded Basic/AMI/AMR (Number)*

2.1.9.1 Number of interventions

The number of proposed interventions for total meters upgraded Basic/AMI/AMR for SR27 is 130,000.

The figures show the national rollout of Smart Meters across Scotland.

The Smart Metering Programme plans to upgrade all 135,000 revenue meters to Smart Meters, with 5,000 of these being replaced before SR27.

2.1.9.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for total meters installed Basic/AMI/AMR in SR27 is £54.327m.

The costs cannot be directly deduced from entries in Table X.

A unit rate of £440 is used (excluding all infrastructure costs). This depends on the successful completion later in the SR21 period of a live procurement exercise to secure a significantly discounted rate for a roll-out over a 6-year period.

Despite the large-scale replacement program, benchmarking with the recent smart metering deployment in England is challenging due to the absence of household metering in Scotland and its impact on efficiency and network densification. The price of a smart meter will vary depending on technology and whether additional hardware is required to boost the signal, which may be necessary in several areas across Scotland. Our NHH rollout is relatively low volume and geographically dispersed, significantly affecting install cost efficiency and network economics (e.g., the ratio of comms gateways to meters achievable in a geographic area). Therefore, unit costs are expected to be higher than those of English water companies.

2.1.9.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.2 Block B: Waste water

2.2.1 *9.5 – Continuous river water quality monitoring – Continuous water quality monitoring installed (number)*

SEPA is responsible for monitoring and reporting on continuous river water quality. Scottish Water has no planned interventions or expenditure spend in this area.

2.2.2 *9.6- Flow monitoring at wastewater treatment works- Flow monitoring schemes applied and installed (Number)*

2.2.2.1 Number of interventions

The number of proposed interventions for flow monitoring schemes applied and installed for SR27 is currently zero.

The required number of monitor installations is subject to ongoing study work and is expected to remain uncertain at the time of submitting the Final Business Plan. The outcome of the study work will therefore feed into ongoing discussions through Investment Planning and Prioritisation Framework in SR27.

2.2.2.2 Capital Expenditure (£m – 2024-25 price base)

An allocation of £9.497m has been allowed for the installation of monitors identified as required to verify pass forward flow.

Expenditure in future periods has been set to zero as no additional new monitors are forecast to be required.

This is supported by a further allocation of £90.112m to subsequently deliver improvements (Licence changes or capital investment as required) to the highest priority sites, as revealed through monitoring. This is in addition to £1.213m allocated to pass forward flow improvement as part of a multi-driver project at Laighpark STW.

Strategic (average) unit costs for improvements used in the LTIS are:

- £100,000.00 for a licence amendment
- £3,900,000.00 for a capital improvement to enable pass forward flow compliance.

2.2.2.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.2.3 9.7- Event duration and flow monitoring for wastewater pumping station emergency overflows- New event duration and flow monitors installed (Number)

2.2.3.1 Number of interventions

All numbers related to Storm Overflows (SOs). Currently, there are no requirements for monitoring EOs in Scotland, although in some cases the EO outfalls will be combined with SOs.

The total number of overflows across Scotland is circa 4,300, of which 20% are related to waste water pumping stations. 3,000 of these are due to be monitored during the SR21 period, leaving 1,300 to be completed in the SR27 period. As the monitoring programme is dynamically prioritised, the exact number of overflows at waste water pumping stations remaining to be monitored in the SRC27 period will be uncertain until 1st April 2027.

According to the foregoing commentary, the number of proposed interventions for new event duration and flow monitors installed at waste water pumping stations for SR27 is forecast to be 260.

2.2.3.2 Unit cost

The current delivery unit cost is £7,000 per monitor.

2.2.3.3 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for new event duration and flow monitors installed in SR27 is £1.835m.

This data is sourced from Table X which is the source file to Table 5, relating to WIC Need Code 869.

As 20% of total investment aligned to the proportion of monitors at SPSs. Investment in SPS monitoring beyond the SR27 period is restricted to network monitoring and is therefore not included in this line.

2.2.3.4 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.

2.2.4 9.8- Chemicals removal- Current population equivalent served by WWTWs with tightened/ new permits for chemicals/ hazardous substances (000's)

2.2.4.1 Number of interventions

The number of proposed interventions for current population equivalent served by WWTWs with tightened/ new permits for chemicals/ hazardous substances for SR27 is 149,563.

This data is sourced from Table X which is the source file to Table 5. The needs allocated are 953 for Whitburn, East Calder and Blackburn projects.

All relate to returning PFI sites and have a compliance date of December 2027.

RBMP4 may require additional enhancement work. This is excluded from our Business Plan as an exogenous risk.

2.2.4.2 Capital Expenditure (£m – 2024-25 price base)

The capital expenditure for new event duration and flow monitors installed in SR27 is £4.563m.

This data is sourced from Table X which is the source file to Table 5, relating to WIC Need Code 953 for Whitburn, East Calder and Blackburn projects.

2.2.4.3 Totex Expenditure (£m – 2024-25 price base)

This has been set equal to the Capital Expenditure. No opex adjustments have been made related to these investments.