# STRATEGIC REVIEW OF CHARGES 2027-33: DRAFT DETERMINATION APPENDICES

30 June 2026

WICS Economic regulation for Scotland's water

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# 1. Review of the investment programme

## 1.1. Overview

1.1.1. For reference, figures for investment and expenditure in this document are given in 2024-25 prices unless otherwise stated. Figures for bills and customer savings are given in 2026-27 prices unless otherwise stated.

1.1.2. This appendix provides further detail for Chapter 5 Investment allowances and how WICS has reviewed and analysed the investment projects and programmes of work within Scottish Water's final Business Plan.

1.1.3. WICS used several approaches for the review based on criteria such as the overall SRC27 cost for the investment areas within the investment programmes, the availability of benchmarking data from England and Wales companies, the availability of investment cases, the development maturity of the proposed projects and programmes of work, and others.

1.1.4. These approaches include the following:

- Testing the investment with Scottish Water's regulators, DWQR and SEPA, where appropriate;
- Review of investment cases;
- Review of asset maintenance investment (by reviewing Scottish Water's Management Approach policies);
- Benchmarking of projects and programmes of work;
- External engineering review of projects and programmes by engineering consultants; and
- Review of Scottish Water's evidence on investment efficiency.

1.1.5. Table 1 below provides a summary overview of the 4 main approaches applied to each investment programme within the areas covered by the business plan technical appendices. Note that Scottish Water's proposal for Real Price Effects (last line in table) has been reviewed separately and our assessment is captured in Chapter 5 Investment allowances.

1.1.6. The remainder of the appendix is structured as follows:

- Background and methodology of approaches used (as listed in paragraph 1.1.4);
- Review of investment related to drinking water quality and continuity;
- Review of investment related to water environment and managing quantity of flows;
- Review of investment related to growth in connections;
- Review of investment related to other areas (climate change adaptation and mitigation, support services and other);

- Review of Scottish Water's evidence on overall investment efficiency;
- Review of the deliverability of the proposed investment programme;
- Review of Scottish Water's improvement plans; and
- Overall conclusions from the review of the investment plan.

*Table 1: Approaches for reviewing investment allowances by area*

| Technical Appendix Area | Investment Programme | Investment (2024-25 prices; £m) | Investment case review | Asset maintenance (Management Approach) review | Benchmarking review | External engineering review |
|---|---|---|---|---|---|---|
| TA001 - Water Quality | Water Treatment | 1,294 | ✓ | ✓ | | ✓ |
| TA001 - Water Quality | Water Storage | 318 | ✓ | | | ✓ |
| TA001 - Water Quality | Water Distribution | 64 | | ✓ | | |
| TA001 - Water Quality | Lead Management | 36 | | | ✓ | |
| TA001 - Water Quality | Raw Water and Catchment Management | 9 | | | | |
| TA002 - Water Continuity | Abstraction, Sources and Raw Water Transfers | 427 | ✓ | ✓ | | ✓ |
| TA002 - Water Continuity | Water Treatment | 7 | ✓ | | | |
| TA002 - Water Continuity | Water Transmission (trunk mains and strategic pipelines) | 99 | ✓ | ✓ | | |
| TA002 - Water Continuity | Water Pumping Stations | 48 | | ✓ | | |
| TA002 - Water Continuity | Water Distribution | 686 | ✓ | ✓ | ✓ | |
| TA002 - Water Continuity | Resilience and Growth | 126 | ✓ | | | |
| TA002 - Water Continuity | Other Programmes | 377 | ✓ | ✓ | ✓ | ✓ |
| TA003 - Water Environment | Waste Water Treatment | 983 | ✓ | ✓ | ✓ | ✓ |
| TA003 - Water Environment | Waste Water Bioresource Treatment | 157 | ✓ | | ✓ | ✓ |
| TA003 - Water Environment | Water Treatment Works Sludge Storage | 17 | ✓ | | | |
| TA003 - Water Environment | Waste Water Sewer Networks | 413 | ✓ | ✓ | ✓ | ✓ |
| TA003 - Water Environment | Waste Water Other – Region Wide | 291 | ✓ | ✓ | | |
| TA003 - Water Environment | Water Abstraction - Water Resources Environmental Monitoring and Compliance | 6 | | ✓ | | |
| TA003 - Water Environment | Water Reservoir Compensation Compliance and RBMP Enhancement | 40 | | ✓ | | |
| TA003 - Water Environment | Other PFI Transfers | 7 | | | | |

| Technical Appendix Area | Investment Programme | Investment (2024-25 prices; £m) | Investment case review | Asset maintenance (Management Approach) review | Benchmarking review | External engineering review |
|---|---|---|---|---|---|---|
| TA004 - Managing Quantity of Flows | Asset Repair, Refurbishment and Replacement (AR3) | 603 | ✓ | ✓ | | ✓ |
| TA004 - Managing Quantity of Flows | Enhancement | 367 | ✓ | | ✓ | ✓ |
| TA005 - Enabling Growth | Waste water Growth | 319 | ✓ | | ✓ | ✓ |
| TA005 - Enabling Growth | Water Growth | 71 | ✓ | | ✓ | |
| TA005 - Enabling Growth | Infrastructure Investment | 123 | | | ✓ | |
| TA005 - Enabling Growth | Service Relocations | 38 | | | ✓ | |
| TA006 - Climate Adaptation | Enhancement to Scotland's natural capital | 7 | | | | |
| TA006 - Climate Adaptation | Increase biodiversity beyond statutory levels | 5 | | | | |
| TA006 - Climate Adaptation | Understand the implications of climate change and risks to service resilience | 2 | | | | |
| TA007 - Climate Mitigation | Process Emissions | 15 | | | ✓ | |
| TA007 - Climate Mitigation | Carbon Capture | 29 | | | ✓ | |
| TA007 - Climate Mitigation | Pilot activities | 16 | | ✓ | ✓ | |
| TA010 - West Central Bioresources | West Central Bioresources | 557 | | ✓ | | ✓ |
| TA015 - Customer and Communities | Customer Research | 2 | | | | |
| TA015 - Customer and Communities | Priority Service Register Improvements | 4 | | | | |
| TA015 - Customer and Communities | Digital Developments for Customer Experience enhancements | 5 | | | | |
| TA015 - Customer and Communities | Access to assets | 6 | | | | |
| TA015 - Customer and Communities | Campaigns & marketing | 4 | | | | |

| Technical Appendix Area | Investment Programme | Investment (2024-25 prices; £m) | Investment case review | Asset maintenance (Management Approach) review | Benchmarking review | External engineering review |
|---|---|---|---|---|---|---|
| TA017 - Digital | Efficient planning & delivery | 17 | | ✓ | | |
| TA017 - Digital | Risk and Security | 46 | | ✓ | | |
| TA017 - Digital | Commodities & Infrastructure | 44 | | ✓ | | |
| TA017 - Digital | Intelligent Decision Making | 1 | | ✓ | | |
| TA018 - Transformation & Innovation | Enable Innovation | 23 | | | | |
| TA018 - Transformation & Innovation | Lighthouse projects | 5 | | | | |
| TA018 - Transformation & Innovation | Research and Hydro Nation | 4 | | | | |
| Support Services | Juniper | 110 | ✓ | | | |
| Support Services | Maintain existing fleet | 115 | | ✓ | | |
| Support Services | Maintain existing offices and estates | 66 | | ✓ | | |
| Support Services | Maintain existing renewable energy | 18 | | | | |
| Support Services | Maintain scientific equipment | 7 | | | | |
| Real Price Effects | Real Price Effects | 60 | | | | |
| | **Total** | **8,093** | | | | |

## 1.2. Background and methodology of approaches used

1.2.1. This section explains the methodology WICS used under each approach for reviewing the different aspects of the investment programme as outlined in paragraph 1.1.4:

- Testing the investment with Scottish Water's regulators, DWQR and SEPA, where appropriate;
- Review of investment cases;
- Review of asset maintenance investment (by reviewing Scottish Water's Management Approach policies);
- Benchmarking of projects and programmes of work; and
- External engineering review of projects and programmes by engineering consultants.

1.2.2. The outcomes of applying each approach are explained in the subsequent sections for investment in water (1.3), wastewater (1.4), growth (1.5) and other areas (1.1).

### Testing the investment with Scottish Water's regulators

1.2.3. We wrote to DWQR and SEPA requesting their views on the final business plan, recognising that a large proportion of Scottish Water's investment programme is to ensure compliance with regulatory requirements.

1.2.4. In relation to the areas that apply to DWQR (water quality) and SEPA (water environment), we asked the respective regulators for their views on:

- the main drivers of Scottish Water's proposed investment programme, including which projects and programmes are required to meet statutory requirements and which are more discretionary;
- the proposed outcome measures and Scottish Water's performance forecasts; and
- any other issues relevant to WICS' determination.

1.2.5. We also had further engagement with DWQR and SEPA on specific aspects of Scottish Water's investment programme, based on questions that arose from the review of investment cases.

### Review of investment cases

1.2.6. This sub-section explains how we undertook an engineering review of the investment case information for asset maintenance, enhancement and growth projects which exceed £6 million in value. It covers the following:

- A summary of the information requirements from WICS' SRC27 Final Methodology and the evidence Scottish Water provided in the final business plan;

- The prioritisation approach we used for selecting a sample for our engineering review; and
- Our approach for reviewing the investment case information.

*Information requirements from WICS' SRC27 Final Methodology and Scottish Water's submission*

1.2.7. Recognising that at the time of the final business plan, Scottish Water's investment proposals would be at different stages of maturity, we adopted a tailored approach to how we would review Scottish Water's proposed investment programme that involves an element of enhancement and growth investment.

1.2.8. We based our approach on the different stages of a project's maturity based on Scottish Water's investment gates, as shown in Table 2.

*Table 2: Scottish Water's investment gates*

| Stage | Gate | Description |
|---|---|---|
| Development gates | 30 | Initiation (of need to develop options for an intervention) |
| | 40 | (Strategic) Option Appraisal |
| | 50 | Option(s) confirmation |
| | 70 | Promotion of project |
| | 80 | Commitment - Project approval |
| Commitment stage | 90 | Commitment - Delivery approval |
| Delivery gates | 100 | Project acceptance |
| | 110 | Financial closeout |
| | 120 | Project closed |

1.2.9. Table 3 provides our associated information requirements based on these gates.[1]

*Table 3: Tailored approach to reviewing Scottish Water's investment proposals*

| Investment stage | Information requirements | Our confirmed approach |
|---|---|---|
| Early stage of development<br><br>(Pre Scottish Water internal Gate 50) | • Programmes of work<br>• Assumptions for indicative costings and outputs | Test the reasonableness of Scottish Water's assumptions and conduct high-level benchmarking |

[1] WICS (2024), 'Strategic Review of Charges 2027-2033: Final Methodology', 12 December 2024, pp. 121-122.

| Investment stage | Information requirements | Our confirmed approach |
|---|---|---|
| Mature stage of development<br><br>(Scottish Water internal Gates 50 to 90, inclusive) | • Programmes of work<br>• Discrete projects where investment ≥ £6 million<br>• Forecast costs<br>• Outputs<br>• Interim milestones for when Scottish Water expects a decision for the project to be committed | Review the investment case (see below) in more detail, examining factors such as:<br>• the justification for investment, taking account of the views of DWQR and SEPA<br>• the options considered and proposed scope<br>• assumed costs and evidence of efficiency<br>• wider benefits such as the impact on natural and social capital<br><br>Assessment of efficiency |
| Investment in delivery<br><br>(Post Scottish Water internal Gate 90) | • Programmes of work<br>• Discrete projects where investment ≥ £6 million<br>• Costs (in real prices and outturn prices)<br>• Outputs<br>• Project milestones | Same as above.<br><br>We consider that assessing efficiency at this stage would inform the assessment in the previous stage, rather than revisiting the allowance for investment post-commitment. |

1.2.10. We required Scottish Water to provide standard information within investment cases for all projects and aggregated programmes of work which are in development and post-commitment, i.e. Scottish Water's internal Gate 50 onwards when Scottish Water conducts a strategic options review.[2] The standard information covers the following areas, which WICS have named for ease of reference:

- **Need/Options**: the range of options considered (both traditional and non-traditional) to meet the need for an investment, including the risk of not doing anything, recognising that a 'do nothing' option still has a cost associated with it. We also acknowledge that in some cases, Scottish Water may have less flexibility in deciding how and when to deliver investment outcomes, particularly if the situation is urgent and/or poses a high risk to public health;
- **Quality regulator engagement**: whether the investment has the support of the quality regulators, DWQR and SEPA;

[2] WICS (2024), 'Strategic Review of Charges 2027-2033: Final Methodology', 12 December 2024, pp. 122-123.

- **Climate change adaptation and policy development**: how the investment will support climate change adaptation and align with the Scottish Government's policy development work;
- **Cost-benefit analysis (CBA)**: the cost-benefit analysis undertaken to select the proposed solution, taking account of factors such as the level of risk associated with the different options and benefits in terms of what the investment is expected to achieve. Scottish Water should also consider non-financial costs and benefits such as the carbon impact (both operational and embodied carbon), natural and social capital;[3]
- **Efficiency**: evidence that the proposed costs for the proposed solution are efficient, which could be evidenced through different methods such as comparisons to past projects or the use of industry cost benchmarks (efficiency is covered in more detail below) or external assurance on the robustness of the cost estimates;
- **Cost sharing with partners**: whether the investment involves partners, recognising the expectation in the Commissioning letter for Scottish Water to continue working closely with partners to identify more sustainable solutions (such as the adoption of blue-green infrastructure and utilising existing legislation, such as section 29e[4] to explore innovative solutions) and, if so, how costs will be shared with the partners, including the funding arrangements;
- **Customer and community views**: if Scottish Water has already engaged with communities in terms of project design, how those community views have informed the choice of the proposed solution; and
- **Clarity of benefits**: the output(s) and benefits that will be delivered from the proposed solution and the outcomes that the investment will contribute to in the context of the Objectives of the Scottish Ministers and Scottish Water's contribution to the sector vision.

1.2.11. The methodology also applied a monetary threshold for how the information is grouped. If a project has total costs above £6 million (not just forecast costs for the 2027-33 period) or is novel or contentious, an individual investment case should be submitted. Projects for less than £6 million and not novel or contentious can be grouped into programmes of work, and an investment case should be submitted for each programme.[5]

1.2.12. WICS provided a methodology clarification in its feedback to Scottish Water on the draft Business Plan, stating that Scottish Water should clearly explain the rationale for the investment need, as well as the assumptions for the benefits and the costing of the

[3] Natural and social capital are two capitals that form the six capitals approach. The six capitals approach covers financial, manufactured, intellectual, human, social and relationships and natural capital. See Association of Chartered Certified Accountants, 'Integrated reporting and performance management', webpage.
[4] Section 29e of the Water Industry (Scotland) Act 2002.
[5] WICS (2024), 'Strategic Review of Charges 2027-2033: Final Methodology', 12 December 2024, pp. 122-124.

investment pre-Gate 50, within the final business plan submission. This includes explaining the methodology used to calculate the estimates and the underpinning assumptions.[6]

1.2.13. In the final Business Plan submission, Scottish Water provided the following investment case documents:

- Project bridging documents and Project Investment Appraisals (PIAs)[7] for 14 asset maintenance projects and for 47 enhancement and growth projects;
- 50 Management Approach documents for asset maintenance investment in programmes of work and projects;[8]
- 25 evidence packs for programmes of work and groupings of projects where each project is less than £6 million in total value.

*Prioritisation approach for selecting a sample for review*

1.2.14. WICS developed a methodology to prioritise projects and programmes for review based on their value (in 2024-25 prices) and the maturity of the available investment case information (i.e. the last approved gate of Scottish Water's project development process). WICS applied this methodology to the data contained in 'Table X', which is the detail underpinning the business plan Table 5. The methodology is explained in the following paragraphs.

1.2.15. As per paragraph 1.2.11 the SRC27 Final Methodology applied a threshold of at least £6 million in total costs (not just costs forecast for the 2027-33 period) for providing an investment case. The first step of the methodology is to focus the review on projects or programmes of work which have a total value in the SRC27 period of more than £6 million. This filter was applied to the full project cost, encompassing all investment needs to be addressed, recognising that Table X splits a single project into separate lines for each Need.

1.2.16. The second step is to exclude all investments subject to other reviews:

- a programme of works (i.e. covers many sites across a wide geography) – this will be reviewed through benchmarking, review of the Management Approaches, and external engineering review;
- investment related to returning PFI assets – this will be subject to an external engineering review; and

[6] WICS (2025), 'Feedback on Scottish Water's draft Business Plan for SRC 2027-2033', 28 August 2025, p. 87.
[7] For an overview of how Scottish Water's PIAs at different stages (1, 2, 3a, 3b and 4) map to project development gates, see Figure 24 in Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 008 - Investment Planning', 26 February 2026, p.45.
[8] This does not include an additional Management Approach (MA076 - Wastewater Studies), which was shared by Scottish Water through the query process. We also reviewed MA076.

- investment in Part 3 assets[9] that relate to background growth not attributable to a development – this will be reviewed through benchmarking.

1.2.17. The remaining sample includes only discrete named projects with total SRC27 costs of at least £6 million – a total of 106.

1.2.18. In line with our methodology, the third step is to prioritise the projects based on project value and the last approved development gate. For project value, the higher the project's SRC27 cost, the higher the priority score we assigned (ranging from 1 to 3 points, with projects costing less than £6 million in SRC27 receiving 0 points). Regarding project maturity, projects in development/pre-commitment received the highest priority, followed by projects in pre-development (rated 1-3 points, with projects that have already started on site receiving 0 points). The two priority sub-scores were then combined to create an overall priority score ranging from 1 to 6.

1.2.19. The fourth step was to focus the review on the projects which have an individual investment case submitted with the final business plan. Finally, the following adjustments to the resulting list were made:

- Project 'North Berwick WwTW – UWWTD Compliance' was excluded from the list as it has already undergone an external engineering review (see results in sub-section 1.5);
- Project 'S-WW-140325-Stirling WWTW Growth and CM' (which doesn't have an individual investment case) was added to the list because it can be reviewed alongside project '5363112919 New Bandeath WwTW – Growth';
- Project 'SR21 Mannofield WTW' (which costs £1 million in SRC27 in 2024-25 prices) was added to the list because the evidence for it is included in the same evidence pack as project 'SR21 Mannofield WTW - Ceramic'; and
- Project 'SR21 Daer WTW' was added to the list (its total value in SRC27 is £5.998 million, which is just under the £6 million threshold from Step 1) because it is covered by the same evidence pack as project 'Daer WTW - DEVELOP - Strategic Replacement'.

1.2.20. Based on this approach, we reviewed the 63 projects listed in Table 4 (ordered by decreasing priority score).

[9] Part 3 assets include the local bulk infrastructure, such as trunk mains and trunk sewers, water service reservoirs, wastewater pumping systems and some SUDS.

*Table 4: List of projects for engineering review by WICS*

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Last approved gate | Primary Technical Appendix |
|---|---|---|---|---|
| 5363112528 | SR21 Juniper House Refurbishment | 110 | Gate 70 | Support Services |
| 5363112919 | New Bandeath WwTW - Growth | 50 | Gate 50 | Enabling Growth |
| 5363118737 | S-WW-140325-Stirling WWTW Growth and CM | 36 | Gate 40 | Enabling Growth |
| 5363113077 | SR21 Turriff WTW | 142 | Gate 50 | Water Quality |
| 5363113079 | SR21 Glendevon WTW | 53 | Gate 50 | Water Quality |
| 5363113086 | SR21 Mannofield WTW - Ceramic | 63 | Gate 50 | Water Quality |
| 5363113110 | SR21 Mannofield WTW | 1 | Gate 50 | Water Quality |
| 5363113087 | SR21 Bradan_WTW Future Plan | 50 | Gate 50 | Water Quality |
| 5363110201 | W571 - Dolphin Road Glasgow | 15 | Gate 70 | Wastewater Flows |
| 5363110202 | NE60 Cavendish Avenue area Perth | 10 | Gate 50 | Wastewater Flows |
| 5363110861 | Lomond Scheme - Distributed Control System DCS replacement or renewal | 24 | Gate 50 | Water Continuity |
| 5363110875 | Balmore WTW HV Asset Replacement | 12 | Gate 50 | Water Continuity |
| 5363111113 | Kinning Park WwPS - Asset Replacement | 49 | Gate 50 | Water Environment |
| 5363111130 | ALLANFEARN STC NH711475 - REPLACEMENT OF DIGESTER 1 AND 2 | 19 | Gate 70 | Water Environment |
| 5363112312 | Allanfearn WwTW - Treatment and bioresource | 55 | Gate 40 | Water Environment |
| 5363112893 | Dunbar WwTW - Growth | 36 | Gate 60 | Water Environment |
| 5363112894 | Dalderse WwTW - Growth | 16 | Gate 50 | Water Environment |
| 5363112948 | Erskine WwTW - Growth | 19 | Gate 70 | Enabling Growth |
| 5363113090 | SR21 Stornoway WTW | 49 | Gate 50 | Water Quality |
| 5363113108 | Lintrathen WTW - OT - ASD and Disinfection Upgrades | 11 | Gate 70 | Water Quality |
| 5363113113 | SR21 ASD - Blairlinnans WTW | 12 | Gate 70 | Water Quality |
| 5363113225 | Invercannie 1924 Aqueduct Conduit Replacement | 28 | Gate 70 | Water Continuity |
| 5363113405 | Loch Katrine New Aqueduct North End Long Chamber to South End Long Chamber | 22 | Gate 50 | Water Continuity |
| 5363113603 | Fauldhouse WwTW River Almond Ww WFD Improvements | 11 | Gate 50 | Water Environment |

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Last approved gate | Primary Technical Appendix |
|---|---|---|---|---|
| 5363117633 | Turriff WwTW - Capital Maintenance | 14 | Gate 70 | Water Environment |
| 5363110167 | AVSE - Growth (capex) Seafield | 18 | 0 | Enabling Growth |
| 5363110205 | 719-1 Queen Street Dumfries | 8 | Gate 50 | Wastewater Flows |
| 5363110206 | IFOS Empire Way and Dominion Road Gretna - 347 2 | 9 | Gate 50 | Wastewater Flows |
| 5363110207 | EFOS - Barron Terrace and Waggon Road Leven | 7 | Gate 60 | Wastewater Flows |
| 5363110870 | Glenhove TWP - HV Asset Replacement | 7 | Gate 50 | Water Continuity |
| 5363110880 | SR21 Tiree Resilience | 21 | Gate 40 | Enabling Growth |
| 5363110881 | SR21 Taymouth Growth | 16 | Gate 30 | Enabling Growth |
| 5363111111 | Troqueer WWPS - Site Replacement | 7 | Gate 50 | Water Environment |
| 5363111134 | Shieldhall WWTW - Control System Replacement | 10 | Gate 50 | Water Environment |
| 5363111141 | Shieldhall WwTW - HV Refurbishment | 8 | Gate 50 | Water Environment |
| 5363111172 | MA037 Castle Moffat CWT | 12 | 0 | Water Quality |
| 5363111742 | North Lodge Rd WWPS1 Pumping Main Replacement Phase 3 | 12 | Gate 30 | Wastewater Flows |
| 5363112574 | Persley Growth from Aberdeen Strategy | 19 | 0 | Enabling Growth |
| 5363112576 | Nigg Growth small option | 19 | 0 | Enabling Growth |
| 5363112906 | Rosewell WwTW Growth | 9 | Gate 50 | Enabling Growth |
| 5363112907 | Roslin WwTW Growth | 7 | Gate 50 | Enabling Growth |
| 5363112911 | Meigle WwTW - Growth | 7 | Gate 50 | Enabling Growth |
| 5363112912 | Oldmeldrum WwTW - Growth | 8 | Gate 70 | Enabling Growth |
| 5363112935 | Ballater WwTW - Growth | 6 | Gate 70 | Enabling Growth |
| 5363113036 | RCI Tiree DMA Sandaig | 6 | Gate 70 | Water Continuity |
| 5363113095 | SR21 ES Torra WTW | 6 | Gate 70 | Water Quality |
| 5363113099 | SR21 Camphill WTW | 21 | Gate 40 | Water Quality |
| 5363113111 | SR21 Penwhirn WTW | 25 | Gate 30 | Water Quality |
| 5363113129 | SR21 Glenlatterach WTW | 25 | Gate 30 | Water Quality |
| 5363113139 | SR21 Londornoch WTW | 47 | Gate 30 | Water Quality |
| 5363113179 | Greenock WTW | 12 | 0 | Water Quality |

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Last approved gate | Primary Technical Appendix |
|---|---|---|---|---|
| 5363113549 | SW1670 - Borrowmeadow Road Stirling | 8 | Gate 70 | Wastewater Flows |
| 5363113565 | IFOS - Peatville Terrace Edinburgh - E1537 | 6 | Gate 50 | Wastewater Flows |
| 5363113592 | Daer WTW - DEVELOP - Strategic Replacement | 31 | 0 | Water Quality |
| 5363113124 | SR21 Daer WTW | 6 | Gate 60 | Water Quality |
| 5363113593 | Carron Valley WTW - DELIVER - Taste & Odour Improvements | 19 | 0 | Water Quality |
| 5363113601 | Persley WwTW River Don WW WFD Improvement | 7 | Gate 70 | Water Environment |
| 5363117623 | Assynt WOA - Maryburgh Trunk Main | 6 | Gate 70 | Water Continuity |
| 5363117638 | Pathhead WwTW - Capital Maintenance | 6 | Gate 60 | Water Environment |
| 5363113083 | SR21 ES Glenfarg WTW upgrade | 51 | Start On Site | Water Quality |
| 5363110889 | Edinburgh Lothians Castle Moffat Hopes - Resilience and Growth | 7 | Gate 30 | Water Continuity |
| 5363112317 | Turret - Legacy Sludge | 11 | Gate 80 | Water Environment |
| 5363112903 | Balmaha WwTW - Growth | 7 | Gate 80 | Water Environment |
| | **Total** | **1,426** | | |

*Approach for reviewing the investment case information*

1.2.21. In addition to developing a prioritisation approach for selecting a sample of projects to review, WICS also developed internal guidance for assessing investment cases and other information submitted to support the investment plan. The assessment also serves as a tool to confirm whether Scottish Water has and is following a robust framework and appropriate governance processes for appraising projects.

1.2.22. WICS conducted an in-the-round qualitative assessment of the sample of investment cases identified in Table 4. Each investment case was scored using a Red-Amber-Green as defined in Table 5 based on how well it has met WICS' criteria, described further below.

*Table 5: RAG scoring scale for assessing investment cases*

| Score | Definitions for pre-G50 investment cases | Definitions for post-G50 investment cases | Impact on Determination |
|---|---|---|---|
| **Red** | The investment case does not robustly demonstrate the need for investment or WICS has significant concerns over the cost estimates. | | Investment for this project or programme is not allowed, or is allowed subject to further evidence. |
| **Amber** | The investment case robustly demonstrates the need for investment, however; WICS has reservations about the appropriateness of the assumptions or the approach used to estimate costs and benefits. | The investment case meets the Need/Options criterion, however one of the following is true:<br>• WICS has reservations about how well the other criteria are met, or<br>• the investment case does not meet all other primary criteria (as defined in Table 6). | WICS has reservations about these projects. A project-specific efficiency challenge may be appropriate in addition to the overall efficiency challenge applied to the whole investment plan. |
| **Green** | WICS has no material concerns about the quality of the evidence in the investment case. | The investment case meets all primary criteria. | Investment for this project or programme is allowed, only subject to the overall efficiency challenge applied to the whole investment plan. |

1.2.23. Following the SRC27 Final Methodology, the approach distinguishes between projects and programmes that have not been developed in detail and have not reached Scottish Water's Gate 50 milestone, and those that have passed Gate 50 and should have at least a strategic options appraisal.

1.2.24. Regarding the information on pre-G50 investments, WICS required Scottish Water to clearly explain the rationale for the investment need as well as the assumptions for the benefits and costs of the investment within the final business plan submission. This includes explaining the methodology used to calculate the estimates, as well as the underpinning assumptions (see paragraph 1.2.12).

1.2.25. Regarding the information on post-G50 investments, the SRC27 Final Methodology required these investment cases to cover 8 areas, as outlined in paragraph 1.2.7. The 8 areas have been categorised as primary and secondary as per Table 6 to simplify the assessment and recognise that the secondary criteria may not be applicable for each investment case, or the consequences of not meeting the criteria might have a smaller impact. The three criteria on cost-benefit analysis, efficiency and clarity of benefits are grouped together as they all relate to aspects of the cost-benefit analysis.

*Table 6: Categorisation of the 8 areas required within an investment case*

| Area/Criterion name | | Category |
|---|---|---|
| Need/Options | | Primary |
| Quality regulator engagement | | Primary |
| Climate change adaptation and policy development | | Secondary |
| Cost-benefit analysis (grouped CBA) | Cost-benefit analysis (CBA) | Primary |
| | Efficiency | |
| | Clarity of benefits | |
| Cost sharing with partners | | Secondary |
| Customer and community views | | Secondary |

1.2.26. In addition to the methodology requirements, for investment post-Gate 50, WICS has also assessed the likelihood of the project being completed within the SRC27 period.

1.2.27. Table 7 and Table 8 list the questions used for assessing the investment cases from Table 4 for pre-G50 and post-G50 projects, respectively, and explain how the RAG status has been applied to each criterion.

*Table 7: Questions for assessing pre-G50 project investment case information*

| Question | Comment |
|---|---|
| **Assessment of Needs & Options** | |
| 1. Is sufficient evidence of the needs provided? (Calculated) | Each need in the investment case is assigned a score based on the level of evidence provided as per the scoring matrix below:<br>4 - Stage 1 Project Investment Appraisal (PIA), regulatory enforcement notice or similar are provided or evidenced<br>3 - Sufficient information regarding the needs provided in Stage 2 or Stage 3a/b PIAs<br>2 - A simple list of needs is provided in the PIA(s) with only limited evidence for the need<br>1 - Needs not presented clearly in the PIA(s)<br>0 - No information provided on why the project is needed<br>The sum of the scores for all needs is then divided by the maximum score this project could receive (the number of needs multiplied by the highest score 4) to get an overall percentage score. If the overall percentage is higher than 66%, WICS assesses there is sufficient evidence to assess the needs. If it is between 33% and 66%, the evidence of needs is adequate but not detailed. If it is below 33%, there is insufficient evidence to assess the needs. |
| 2. Does the investment case clearly demonstrate the need for the project? | Yes/No/Maybe/Not Applicable<br>A manual assessment using WICS' judgement based on the percentage score in Question 1. If the answer is "No", then this criterion is assigned a "Red" RAG status. |
| 3. Is the assumed solution appropriate to the identified needs? | Yes/No/Maybe/Not Applicable |
| **Overall RAG scoring for Needs & Options assessment** | If the answer to Question 2 is "No", then a "Red" status is assigned (i.e. WICS considers the needs are not confirmed). If the answers to Question 2 and Question 3 are "Yes", then a "Green" status is assigned (i.e. WICS considers the need is confirmed and the options are appropriate to the needs). Otherwise, an "Amber" status is assigned (i.e. WICS considers the evidence to assess needs and options is insufficient). |

| Question | Comment |
|---|---|
| **Assessment of Regulatory engagement** | |
| 4. Is there evidence the regulator has been engaged in respect to the project? | Yes/No/Maybe/Not Applicable |
| **Overall RAG scoring for Regulatory Engagement assessment** | If the answer to Question 4 is "No", then a "Red" status is assigned. If the answer is "Yes", then a "Green" status is assigned. Otherwise, an "Amber" status is assigned. |
| **Assessment of Cost estimate** | |
| 5. Is the cost reasonable and appropriate for the assumed solution? | Yes/No/Not enough information |
| 6. What confidence level does WICS have that the cost estimate is reasonable? | High/Low/Undetermined/Not Applicable |
| 7. If the cost estimate is assessed as unreasonable, does the cost estimate appear too low or too high? | Too low/Too high/Not Applicable |
| **Overall RAG scoring for Cost Estimate assessment** | If the answer to Question 5 is "No", then a "Red" status is assigned (i.e., WICS considers the validity of the cost estimate not confirmed). If the answer is "Yes", then a "Green" status is assigned (i.e. WICS considers that based on the information provided the cost estimate appears reasonable for the proposed solution/option). Otherwise, an "Amber" status is assigned (WICS have reservations regarding the reasonableness or efficiency of the cost). |
| **Assessment of Benefits & Risks** | |
| 8. Can the assumed solution reasonably deliver the benefits identified? | Yes/No/Maybe/Not Applicable |
| 9. What is the confidence level that the assumed solution can be delivered in SRC27? | High/Low/Undetermined/Not Applicable |
| **Overall RAG scoring for Benefits and Risk assessment** | If the answer to Question 8 is "No", then a "Red" status is assigned. If the answer is "Yes" but the answer to Question 9 is "Low", then an "Amber" status is assigned. If the answers to question 8 is “Yes” and 9 is "High", then a "Green" status is assigned. Otherwise, an "Amber" status is assigned. |

| Question | Comment |
|---|---|
| **Overall assessment** | |
| Overall assessment | Assessed as "Red" if either the Needs & Options RAG is "Red" or if the Cost estimate RAG is "Red" (i.e. WICS considers that the investment case does not robustly demonstrate the need for the investment). Assessed as "Green" if both of these criteria have a "Green" status and the RAG status of at least one of the other two criteria (Regulatory engagement or Benefits & Risks) is also "Green" (i.e. WICS considers that the investment case meets all primary criteria). Otherwise, the investment case is assessed as "Amber" (i.e. WICS has reservations about how well the criteria are met). |

*Table 8: Questions for assessing post-G50 project investment case information*

| Question | Comment |
|---|---|
| **Assessment of Needs & Options** | |
| 1. Is sufficient evidence of the needs provided? (Calculated) | Each need in the investment case is assigned a score based on the level of evidence provided as per the scoring matrix below:<br>4 - Stage 1 Project Investment Appraisal (PIA), regulatory enforcement notice or similar are provided or evidenced<br>3 - Sufficient information regarding the needs provided in Stage 2 or Stage 3a/b PIAs<br>2 - A simple list of needs is provided in the PIA(s) with only limited evidence for the need<br>1 - Needs not presented clearly in the PIA(s)<br>0 - No information provided on why the project is needed<br>The sum of the scores for all needs is then divided by the maximum score this project could receive (the number of needs multiplied by the highest score of 4) to get an overall percentage score. If the overall percentage is higher than 66%, WICS assesses that there is sufficient evidence to assess the needs. If it is between 33% and 66%, the evidence of need is adequate but not detailed. If it is below 33%, there is insufficient evidence to assess the needs. |

| Question | Comment |
|---|---|
| 2. Does the investment case clearly demonstrate the need for the project? | Yes/No/Maybe/Not Applicable<br>A manual assessment using WICS' judgement based on the percentage score in Question 1. If the answer is "No", then this criterion is assigned a "Red" RAG status. |
| 3. Is the number of long-list options appropriate? | Yes/No/Maybe/Not Applicable |
| 4. Is the number of short-list options appropriate? | Yes/No/Maybe/Not Applicable |
| 5. Are the options described in sufficient detail? | Yes/No/Maybe/Not Applicable |
| 6. Is a base case (do nothing/do minimum) included? | Yes/No/Maybe/Not Applicable |
| 7. Is the proposed solution appropriate to address the needs? | Yes/No/Maybe/Not Applicable<br>If the answer is "No", then this criterion is assigned a "Red" RAG status. |
| 8. Does the solution fully address the needs (i.e. eliminate all risks)? (Calculated) | Each need in the investment case is assigned a score for the base case risk level (i.e. for the Business as Usual case) and for the level of risk reduction indicated from the proposed solution.<br><br>An average risk score is calculated for the base case and the proposed solution case across all project needs. The solution is considered to fully address the needs only if there is 100% risk reduction. |
| 9. Does the proposed solution offer a **significant** level of risk reduction? (Calculated) | If the risk reduction calculated for Question 8 is at least 50%, that is considered significant. If it is between 20% and 50%, it is considered uncertain. If it is below 20%, it is considered marginal and this criterion is assigned a "Red" RAG status. |
| 10. Is the level of risk reduction commensurate with the scale and timing of the project? | Yes/No/Maybe/Not Applicable<br>A manual assessment using WICS' judgement based on the automated answers to Questions 8 and 9. |
| **Overall RAG scoring for Needs & Options assessment** | If the answer is "No" to Questions 2 or 7 or the reduction in risk is <20% for Question 9, then a "Red" status is assigned (i.e. WICS considers that the needs are not confirmed). If at least 5 of the questions from 3 to 10 are answered "Yes", then a "Green" status is assigned (i.e., WICS considers the need confirmed and the options appropriate to the needs). Otherwise, an "Amber" status is assigned (i.e., WICS considers the evidence for assessing needs and options insufficient). |
| **Assessment of Regulatory engagement** | |

| Question | Comment |
|---|---|
| 11. Is there evidence the regulator has been engaged in respect to the project? | Yes/No/Maybe/Not Applicable |
| 12. Does the investment have the support of quality regulators (DWQR/SEPA)? | Yes/No/Maybe/Not Applicable |
| 13. If not supported, has SW provided a sufficient explanation why this is the case? | Yes/No/Maybe/Not Applicable |
| **Overall RAG scoring for Regulatory Engagement assessment** | If the answer to Question 11 is “No”, then a "Red" status is assigned. If there has been engagement and either the regulator supports the project or, if not, Scottish Water has provided sufficient explanation, then a "Green" status is assigned. Otherwise, an "Amber" status is assigned. |
| **Assessment of Cost estimate** | |
| 14. Are estimated costs provided for each short-listed option? | Yes/No/Not Applicable |
| 15. Is a cost estimate provided for the proposed solution? | Yes/No/Not Applicable |
| 16. Is a detailed cost breakdown provided for the proposed solution? | Yes/No/Not Applicable<br>Question is applicable only if answer to Question 15 is "Yes". |
| 17. Is the costing methodology explained along with key assumptions? | Yes/No/Not Applicable |
| 18. Does WICS agree the methodology and the assumptions are sufficiently robust? | Yes/No/Not Applicable |
| 19. Are the results of a whole-life cost (NPC) analysis provided? | Yes/No/Not Applicable |
| 20. Is the proposed solution the lowest whole-life cost option? | Yes/No/Not Applicable |
| 21. Has a reasonable explanation been provided why the lowest whole life cost estimate has not been selected? | Yes/No/Not Applicable<br>Question is applicable only if answer to Question 20 is "No". |
| 22. Is the cost information sufficient for WICS to assess the cost? (Calculated) | If at least 6 of the previous 8 questions have been answered as "Yes", then it is considered there is sufficient cost information to allow further assessment. If that is |

| Question | Comment |
|---|---|
| | not the case, then WICS asked Scottish Water for further information through the final business plan query process. |
| 23. Is the cost of the proposed option/solution as set out in the PIA the same as the cost in Table X? (Calculated) | Yes/No/No data |
| 24. Is the cost difference between Table X-LBE acceptable (<8%)? (Calculated) | Yes/No/No data |
| 25. Is the cost estimate considered reasonable for the scope of the proposed option/solution? | Yes/No/Not enough information<br>This is an open check for material disparity between the estimate presented and the scope of the solution. Based on the information provided, the cost of similar projects known to WICS or in the final business plan and the experience of the reviewing Engineer. |
| 26. What confidence level does WICS have that the cost estimate is reasonable? | Low/High/Undetermined/Not Applicable |
| 27. If the cost estimate is assessed as unreasonable, does the cost estimate appear too low or too high? | Too low/Too high/Not Applicable |
| 28. Has evidence been provided that the costs are efficient? (As evidenced through different methods such as comparisons to past projects or the use of industry cost benchmarks) | Yes/No/Not enough information |
| **Overall RAG scoring for Cost Estimate assessment** | If the answer is “No” to Questions 25 and 28, then a "Red" status is assigned (i.e. WICS considers that the validity of the cost estimate is not confirmed). If the answer to both questions is "Yes”, then a "Green" status is assigned (i.e. WICS considers that, based on the information provided, the cost estimate appears reasonable for the proposed solution/option). Otherwise, an "Amber" status is assigned (i.e. WICS have reservations regarding the reasonableness or efficiency of the cost). |
| **Assessment of Benefits & Risks** | |
| 29. Are the benefits for each short-listed option clearly shown? | Yes/No/Not Applicable |
| 30. Are the benefits well evidenced? | Yes/No/Not Applicable |

| Question | Comment |
|---|---|
| 31. Can the proposed solution/option deliver the benefits identified? | Yes/No/Not Applicable |
| 32. Has a carbon impact assessment been made for the short-listed options? | Yes/No/Not Applicable |
| 33. Does the proposed option/solution have the lowest carbon emissions profile? | Yes/No/Not Applicable |
| 34. If NO, is the selection of the proposed solution justified for other reasons? | Yes/No/Not Applicable |
| 35. Are the levels of risk associated with each short-listed option shown? | Yes/No/Not Applicable |
| 36. Are the risks in delivering the proposed solution identified? | Yes/No/Not Applicable |
| 37. Based on the risk information is delivery likely to be on programme and budget? | Yes/No/Not Applicable |
| **Overall RAG scoring for Benefits and Risk assessment** | If the answer is “No” to either Questions 31 or 37, then a "Red" status is assigned. If at least 5 of the previous 9 questions have been answered with "Yes, then a "Green" status is assigned. Otherwise, an "Amber" status is assigned. |
| **Assessment of Project delivery** | |
| 38. Is the period for project preparation considered reasonable? | Yes/No/Not Applicable |
| 39. Is the period for construction/delivery considered reasonable? | Yes/No/Not Applicable |
| 40. Is the project likely to be completed in the SRC27 period? (Calculated) | If WICS assesses that the likely completion date is after the end of the SRC27 period, then the answer is "Unlikely". If the WICS assessed completion date is within 12 months of the end of the SRC27 period, then the answer is "Possibly". If more than 12 months, then the answer is "Probably". |
| **Overall assessment** | |

| Question | Comment |
|---|---|
| Overall assessment | Assessed as "Red" if either the Needs & Options RAG is "Red" or if the Cost estimate RAG is "Red" (i.e. WICS considers that the investment case does not robustly demonstrate the need for the investment).<br><br>Assessed as "Green" if all of the following conditions are true:<br>• all four sub-assessment RAG statuses are "Green",<br>• there is sufficient information to assess the project cost (Question 22),<br>• the cost difference between Table X and the project investment case is acceptable (Question 24), and<br>• the WICS assessed likely completion date is more than 12 months before the end of the SRC27 period.<br>In other words, WICS considers the investment case meets all primary criteria.<br><br>Otherwise, the investment case is assessed as "Amber" (i.e. WICS has reservations about how well the criteria are met). |

### Review of asset maintenance investment

1.2.28. Our final methodology explains that a key area for improvement in asset maintenance (which covers asset repairs, replacements, and refurbishments, abbreviated as AR3) is to develop detailed bottom-up evidence for future asset replacement.[10] This will help us understand whether Scottish Water is effectively maintaining its asset base and not creating challenges or risks for future generations of customers (recognising the Commissioning letter expectation that Scottish Water maintains service). We required Scottish Water to present its asset maintenance proposals at a higher level, based on programmes of work for different asset categories (e.g., water mains, water treatment works). In the context of asset maintenance, we define programmes of work as investment activities that relate to the same type of assets, involve repeatable work with similar construction requirements and risk profiles, and for which the asset location is unknown. For these programmes of work by asset category, we asked Scottish Water to show its assumptions for the:

- proposed number of maintenance interventions;
- proposed unit cost of interventions; and
- overall level of expenditure.

1.2.29. As explained in paragraphs 1.2.7 to 1.2.12, we required Scottish Water to provide standard information within investment cases for all projects and aggregated programmes of work which are in development and post-commitment (post-Gate 50), and to clearly explain the rationale for the investment need as well as the assumptions for the benefits and costing of investment pre-Gate 50. This includes explaining the methodology used to calculate the estimates and the underpinning assumptions.

1.2.30. Scottish Water explains in its final business plan that it has based all AR3 investment (both for projects and for programmes of work) on Management Approaches (MAs) to ensure the investment is based on consistent decision-making and is fully justified.[11] Scottish Water defines Management Approaches as "policies setting out the criteria under which interventions required to maintain our level of service can be 'triggered' and the cost of this policy approach".[12] Technical appendix 8 also explains how the MAs meet the final methodology requirements from paragraph 1.2.7.

1.2.31. In its final business plan submission, Scottish Water provided 50 Management Approach documents covering £4.7bn of AR3 investment and £0.1bn of enhancement and growth in the SRC27 period (2024-25 prices; post-efficiency) as listed in Table 9 below (the investment values in the table are for both AR3 and for enhancement and growth).

[10] WICS (2024), 'Strategic Review of Charges 2027-2033: Final Methodology', 12 December 2024, p. 118.
[11] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 008 – Investment Planning', 26 February 2026, p. 48.
[12] Scottish Water (2026), 'Final Business Plan 2027-2033 – Investing in Scotland's Future', 26 February 2026, p. 122.

1.2.32. The 9 Management Approaches highlighted in orange (namely, MA004, MA017, MA022, MA024, MA043, MA057, MA113, MA114, and MA119) were excluded from our internal review as they cover programmes of work which were included in the external engineering review, as explained in a later sub-section.

1.2.33. For the remaining 41 Management Approaches, WICS undertook a detailed review of 21 of them based on prioritisation criteria. WICS also reviewed an additional Management Approach (MA076 - Wastewater Studies), which was shared by Scottish Water through the query process. This MA is associated with £54 million of (enhancement) investment in SRC27 (2024-25 prices) and is also included in Table 9 below.

1.2.34. WICS will continue reviewing the remaining management approaches ahead of the final determination.

1.2.35. WICS applied the following RAG scoring matrix when assessing the Management Approaches:

- Red – WICS has significant concerns/questions over the MA, e.g. on the reasonableness of the cost estimates, the frequency/run rate of interventions in the chosen policy option or the level of risk of the policy. WICS to apply a cost challenge.
- Amber – WICS has some concerns/questions over the MA. WICS could apply a cost challenge, e.g. subject to further clarification from Scottish Water.
- Green – WICS has no concerns over the MA. There is no cost challenge proposed.

*Table 9: SRC27 investment by Management Approach*

| MA number | MA Name | Value in SRC27 (2024-25 prices; £m; post-efficiency) | Primary Service | Proportion of value in SRC27 for water | Proportion of value in SRC27 for wastewater | Proportion of value in SRC27 for shared assets | Included in the detailed review |
|---|---|---|---|---|---|---|---|
| MA003 | Maintain Pipebridges | 49 | Wastewater | 0% | 100% | 0% | ✓ |
| MA004 | Reservoir Safety | 300 | Wastewater | 100% | 0% | 0% | |
| MA011 | Wastewater Motor Control Centres | 32 | Wastewater | 0% | 100% | 0% | |
| MA012 | Wastewater Pumping Mains | 138 | Wastewater | 0% | 100% | 0% | ✓ |
| MA013 | Wastewater Control Systems | 41 | Wastewater | 0% | 100% | 0% | ✓ |
| MA016 | Network Water Quality | 60 | Water | 51% | 0% | 49% | ✓ |
| MA017 | Wastewater Treatment Works - Inlet Works | 124 | Wastewater | 0% | 100% | 0% | |
| MA018 | Ironworks | 73 | Wastewater | 0% | 100% | 0% | ✓ |
| MA022 | SCADA PLC HMI | 130 | Water | 100% | 0% | 0% | |
| MA023 | Wastewater Pumping Stations | 144 | Wastewater | 0% | 100% | 0% | ✓ |
| MA024 | Wastewater Bioresource Treatment and De-watering Centres | 447 | Wastewater | 0% | 100% | 0% | |
| MA028 | Water Catchment Management | 9 | Shared Services | 12% | 0% | 88% | |
| MA029 | Offices, Property and Estates | 66 | Shared Services | 9% | 9% | 81% | ✓ |
| MA033 | Water Filtration | 92 | Water | 100% | 0% | 0% | ✓ |
| MA035 | Wastewater Outfalls | 7 | Wastewater | 0% | 100% | 0% | |
| MA036 | Wastewater Screw Pumps | 26 | Wastewater | 0% | 100% | 0% | |
| MA039 | Combined Sewer Overflows | 23 | Wastewater | 0% | 100% | 0% | |
| MA042 | Wastewater Treatment Works - Primary Treatment | 77 | Wastewater | 0% | 100% | 0% | ✓ |

| MA number | MA Name | Value in SRC27 (2024-25 prices; £m; post-efficiency) | Primary Service | Proportion of value in SRC27 for water | Proportion of value in SRC27 for wastewater | Proportion of value in SRC27 for shared assets | Included in the detailed review |
|---|---|---|---|---|---|---|---|
| MA043 | Wastewater Treatment Works Secondary Tertiary Treatment | 203 | Wastewater | 0% | 100% | 0% | |
| MA044 | Telemetry | 23 | Water + Wastewater | 54% | 46% | 0% | |
| MA049 | Wastewater Odour Control Equipment | 13 | Wastewater | 0% | 100% | 0% | |
| MA052 | WTW Sludge and Washwater | 5 | Water | 100% | 0% | 0% | |
| MA053 | Scientific Instrument Replacement | 7 | Shared Services | 0% | 0% | 100% | |
| MA054 | Water and Wastewater Network Modelling | 27 | Shared Services | 0% | 0% | 100% | |
| MA056 | Renewable Energy Asset Maintenance | 18 | Shared Services | 0% | 0% | 100% | |
| MA057 | Wastewater Treatment Works Ancillaries | 160 | Wastewater | 0% | 100% | 0% | |
| MA058 | Water Pumping Stations | 48 | Water | 88% | 0% | 12% | ✓ |
| MA060 | Water Distribution Network Valves | 32 | Water | 100% | 0% | 0% | |
| MA062 | Sewer Structures | 19 | Wastewater | 0% | 100% | 0% | |
| MA063 | Water Resources Environmental Monitoring & Compliance | 45 | Water | 100% | 0% | 0% | ✓ |
| MA066 | Digital | 107 | Shared Services | 0% | 0% | 100% | ✓ |
| MA068 | Statutory, Essential and Planned Maintenance | 96 | Wastewater | 37% | 63% | 0% | ✓ |
| MA071 | Logistics Vehicles | 131 | Shared Services | 0% | 0% | 100% | ✓ |

| MA number | MA Name | Value in SRC27 (2024-25 prices; £m; post-efficiency) | Primary Service | Proportion of value in SRC27 for water | Proportion of value in SRC27 for wastewater | Proportion of value in SRC27 for shared assets | Included in the detailed review |
|---|---|---|---|---|---|---|---|
| MA073 | Distribution Infrastructure - Metering and Flow Monitoring | 41 | Water | 100% | 0% | 0% | ✓ |
| MA076 | Wastewater Studies | 54 | Wastewater | 0% | 100% | 0% | ✓ |
| MA080 | Boreholes and Springs | 10 | Water | 100% | 0% | 0% | |
| MA081 | Water Sample Points | 10 | Wastewater | 0% | 100% | 0% | |
| MA091 | High Voltage Assets | 79 | Water + Wastewater | 42% | 58% | 0% | ✓ |
| MA093 | WTW Civils & Process Structures | 38 | Water | 100% | 0% | 0% | |
| MA094 | WTW Process Stages Mechanical & Electrical | 59 | Water | 100% | 0% | 0% | ✓ |
| MA095 | WTW Water Quality Instrumentation | 57 | Water | 100% | 0% | 0% | ✓ |
| MA098 | Emergency Response | 3 | Shared Services | 0% | 0% | 100% | |
| MA111 | Water Distribution Mains | 554 | Water | 100% | 0% | 0% | ✓ |
| MA113 | Gravity Sewers | 302 | Wastewater | 0% | 100% | 0% | |
| MA114 | Water Treatment, Chemical Storage and Dosing | 143 | Water | 100% | 0% | 0% | |
| MA115 | Water Pipebridges | 15 | Water | 100% | 0% | 0% | |
| MA116 | Strategic Water Infrastructure | 150 | Water | 100% | 0% | 0% | ✓ |
| MA117 | Raw Water Intake and Storage | 13 | Water | 100% | 0% | 0% | |
| MA118 | Water Low Voltage Electrical Systems | 30 | Water | 100% | 0% | 0% | |
| MA119 | Treated Water Storage and Chlorine Contact Tanks and Pipes | 441 | Water | 70% | 30% | 0% | |
| MA120 | Site Buildings and Asset Access | 96 | Water + Wastewater | 46% | 39% | 15% | ✓ |
| | **Total** | **4,868** | | | | | |

### Benchmarking of selected projects and programmes of work

1.2.36. As outlined in our methodology, the scope for efficiency covers two elements:

- Catch-up efficiency: the reduction in expenditure to catch up with leading performing companies (i.e. the 'frontier'); and
- Frontier shift: recognition that the leading performing companies will continue to improve due to productivity improvements.

1.2.37. To gain insights on whether a catch-up efficiency challenge is appropriate in certain investment areas, we have examined Scottish Water's evidence in two main areas:

- Benchmarking of selected projects and programmes of work; and
- Scottish Water's wider evidence on overall investment efficiency based on benchmarking its cost estimating models.

1.2.38. This subsection focuses on the first area – benchmarking of selected projects and programmes of work. There are two elements to this benchmarking:

- Comparisons against those of other companies in selected investment areas; and
- Comparisons against Scottish Water's historic capital investment in certain areas.

1.2.39. To enable comparisons against other companies in selected investment areas, we have examined Ofwat's cost models developed for its 2024 price review (PR24) to understand how Scottish Water's capital costs compare to those of companies in England and Wales. Ofwat developed econometric and unit-cost models to assess company proposals for enhancement investment expenditure, which Ofwat defines as permanent increases or step changes in current service levels or the extension of existing services to new customers. As such, these models cover what we define as enhancement and growth investment in certain investment areas.[13]

1.2.40. In addition to Ofwat's enhancement models, we have also examined other Ofwat data sets published alongside the PR24 final determination that provide the opportunity for benchmarking Scottish Water's capital costs to those of other companies in other investment areas (e.g. water mains renewals).

1.2.41. In line with our EBP&R approach, we, together with Scottish Water, have examined the applicability of the models and datasets to Scottish Water's proposed investment programme for the 2027-33 regulatory period. In doing so, we have focused on two questions:

[13] Further details of these models are available at Ofwat (2024), 'PR24 final determinations expenditure allowances – enhancement cost modelling appendix', December.

- Is Scottish Water investing in similar areas over the 2027-33 regulatory period?
- Is the model or data set applicable to Scotland, recognising differences in environmental and water quality regulations between England and Wales and Scotland?

1.2.42. Based on the answers to these questions, we identified that some models are less applicable to Scottish Water, such as water investigations, as Scottish Water's investment plan does not include investment in these areas.

1.2.43. In its final business plan, Scottish Water provided data and modelling results covering eight areas:[14]

- Phosphorus removal;
- Sanitary parameters tightening;
- Storm overflows;
- Leakage (mains replacement);
- Lead pipe replacement;
- Metering;
- Flow monitoring at wastewater treatment works; and
- Chemicals removal.

1.2.44. Scottish Water explains that its analysis shows it is below or in line with the efficient benchmark used by Ofwat (based on the industry median) in six of the eight areas, with these six areas representing 88% of the value of investment across this set of areas. The two areas where Scottish Water is above the median relate to lead pipe replacement and metering.

1.2.45. Scottish Water considers that there are reasons beyond its control for its higher costs in these two areas. Scottish Water considers that Ofwat recognises such factors in how it uses the models to determine the allowed investment. In particular, Scottish Water notes that Ofwat will set the allowed investment based on the benchmark rather than a company's proposed costs, meaning a company's overall efficiency challenge will reflect its net efficiency position across the different models (i.e. areas where a company's costs are lower than the benchmark will offset areas where costs are higher, resulting in a lower efficiency challenge).

1.2.46. As such, Scottish Water considers that its cost forecasts in these areas are, overall, below or in line with the set of modelled benchmarks used by Ofwat.

1.2.47. Based on our further review of the investment proposed in the final business plan, we have identified other investment areas where there is scope to compare Scottish Water's costs

[14] Scottish Water (2026), 'Technical Appendix 12 – efficiency', 26 February 2026, pp.22-25.

against those of other companies using Ofwat's models and data-sets. These relate to the following investment areas:

- Asbestos cement water mains as part of the mains replacement programme;
- Part 4 water growth;
- Part 4 wastewater growth;
- Water infrastructure investment (part 3 water growth funded from infrastructure charges);
- Wastewater infrastructure investment (part 3 wastewater growth funded from infrastructure charges);
- Industrial Emissions Directive;
- Net zero covering carbon capture and process emissions; and
- Pilot activities.

1.2.48. We have also identified areas where it is possible to compare Scottish Water's proposed investment over 2027-33 to previous investment projects and programmes. These relate to the following investment areas:

- External sewer flooding; and
- Water and wastewater service relocations.

1.2.49. WICS agrees with the sentiment of Scottish Water's point that it is important to consider benchmarking evidence in the round to form an overall assessment. However, this does not preclude applying a targeted, specific cost challenge in areas where we judge there is scope for Scottish Water to further improve its efficiency. As such, we review the benchmarking evidence in each investment area separately to decide whether a further area-specific efficiency challenge is appropriate to capture the opportunities for catch-up efficiency.

1.2.50. Our benchmarking analysis of Scottish Water's costs follows a two-staged approach:

- Examining how Scottish Water's capital costs compare to either those of other companies or its historical expenditure in the relevant investment area; and
- Assessing whether differences in capital costs merit an efficiency challenge, recognising that there may be valid reasons beyond management control that explain differences in company costs.

1.2.51. Table 10 lists the 19 investment areas we have benchmarked. Further details behind each benchmarking model are available in the following sections.

*Table 10: List of investment areas for benchmarking*

| Area | Programme | Sub-area ("Investment Area") | Sub-area investment (2024-25 prices; £m) |
|---|---|---|---|
| Water Quality | Lead Management | Lead Communications Pipe Replacement | 35 |
| Water Continuity | Water Distribution | Maintain distribution mains - Accelerated Asbestos Cement water mains replacement | 143 |
| Water Continuity | Water Distribution | Maintain distribution mains | 392 |
| Water Continuity | Other Programmes | Follow market best practice metering requirements | 7 |
| Water Environment | Waste Water Treatment | WWTW Improvements | 58 |
| Water Environment | Waste Water Bioresource Treatment | Industrial Emissions Directives | 41 |
| Water Environment | Waste Water Sewer Networks | Unsatisfactory intermittent discharges | 269 |
| Water Environment | Waste Water Sewer Networks | Network monitoring | 9 |
| Managing Quantity of Flows | Enhancement | To reduce flood risk to customers impacted by high consequence external sewer flooding where not disproportionately expensive | 45 |
| Enabling Growth | Waste water Growth | Provision of Part 4 capacity to meet strategic & local growth requirements | 319 |
| Enabling Growth | Water Growth | Provision of Part 4 capacity to meet strategic & local growth requirements | 69 |
| Enabling Growth | Infrastructure Investment | Provision of strategic capacity in our networks to meet new demand - Wastewater | 69 |
| Enabling Growth | Infrastructure Investment | Enable economic growth - Water | 55 |
| Enabling Growth | Service Relocations | Comply with legislative requirements - (Water & Wastewater) | 39 |
| Climate Mitigation | Process Emissions | Process Emissions | 15 |
| Climate Mitigation | Carbon Capture | Carbon Capture | 29 |
| Climate Mitigation | Pilot activities | Pilot activities | 16 |
| | | **Total** | **1,610** |

1.2.52. Water meters are not included in Table 10 as this area is subject to an external engineering review that takes account of comparisons of Scottish Water's metering costs with those of other companies.

### External engineering review of projects and programmes by engineering consultants

1.2.53. We highlighted in our final methodology for SRC27 that we would require external technical expertise in engineering and asset management to review two areas of Scottish Water's proposed investment plan within its SRC27 Business Plan:

- The scope of a sample of Scottish Water's proposed investment solutions and the proposed costs; and
- Specific areas of asset management that apply across the investment programme, such as Scottish Water's approach to overheads and risk allowances.

1.2.54. We commissioned engineering consultants WSP to undertake this review on our behalf for both the draft and final business plans. The executive summaries of the final reports from each review are available on our website.

#### *Review of the draft business plan*

1.2.55. For the review of information in the draft business plan, we requested WSP to carry out:

- An engineering review of a sample of 2 programme areas – the areas we chose were the programme of works for maintaining treated water storage and the programme of works for addressing internal sewer flooding;
- An engineering review of a sample of 2 individual projects – the projects we chose were relating to the Black Esk Water Treatment Works and to the North Berwick Wastewater Treatment Works; and
- A review of Scottish Water's proposed level of overheads and approach for allocating these overheads for 2027-33.

1.2.56. In relation to the review of programmes and projects, we asked the consultant to answer the following questions. In the consultant's opinion:

- Has Scottish Water demonstrated that it has considered all reasonable options to meet the desired outcome? Has Scottish Water considered the 'do nothing' option and set out the costs and risks associated with such an option?
- In considering options to meet the desired outcome, how well has Scottish Water considered risk and how does Scottish Water's risk tolerance compare to the risk tolerance and/or levels of risk managed by other companies?

- Is the scope of solution proposed appropriate given the desired outcome and Scottish Water's risk tolerance? If the consultant's view is that the proposed solution exceeds what is necessary to meet the desired outcome taking account of either Scottish Water's risk tolerance or a reasonable risk tolerance, then

  - How does the solution exceed what is required to meet the outcome?
  - What would represent an appropriate scope challenge?

- Is the proposed scope of solution(s) appropriately costed and how do the unit costs/rates compare with similar projects or programmes completed by other water companies? If Scottish Water's unit costs/rates are higher than comparators:

  - Has Scottish Water explained why?
  - What is the consultant's view on Scottish Water's explanation?
  - If applicable, what would represent a reasonable cost challenge?

- Overall, will the proposed project/programme meet the desired outcome most effectively?

1.2.57. Regarding the review of Scottish Water's proposed overhead levels and approach to allocating them, Scottish Water has benchmarked its indirect and on-cost levels against those of comparator companies. One of the metrics it uses relates to 'pound in the ground' analysis, which measures indirect costs as a proportion of total direct construction costs. We asked the consultant to answer the following questions. In the consultant's opinion:

- Is Scottish Water's benchmarking of indirect and on-cost[15] levels (including based on its 'pound in the ground' analysis) against those of other companies robust and in line with the data and evidence available to the consultant (based on a sample of companies)? If not,

  - Which elements are not considered robust?
  - What are the implications regarding the proposed level of on-costs?
  - If applicable, what would represent a reasonable cost challenge?

1.2.58. The findings from the review are summarised in sections 1.3, 1.4, 1.5 and 1.7.

[15] On-costs are interchangeably used with indirect costs to refer to the indirect costs associated with delivering a capital project, typically split into two categories:
▪ Client On-Costs: Costs incurred by the client organisation (in this case, Scottish Water), such as project management, design, governance, stakeholder engagement, and internal overheads.
▪ Contractor On-Costs: Costs incurred by the contractor that are not part of direct construction, including site preliminaries, supervision, and contractor-side project management.

*Review of the final business plan*

1.2.59. WICS commissioned WSP to undertake a similar review of a larger sample of projects and programmes of work from Scottish Water's final business plan. This review had a more focused scope but a wider sample selection to increase coverage of the total investment programme, which has undergone an engineering review.

1.2.60. For the review of information in the final business plan, we requested WSP to carry out:

- An engineering review of the West Central Bioresources project – this project is estimated to cost around £560 million in SRC27 (2024-25 prices) including necessary upgrades to satellite sites and the asset maintenance required at the central Daldowie site immediately upon the expiry of the Private Finance Initiative contract in 2026 (for further details on this project and the Scottish Government assurance requirements for WICS please refer to Appendix 4);
- An engineering review of another individual project – this was selected to be the smart meter roll-out to non-domestic premises, estimated to cost £60 million in SRC27 (2024-25 prices); and
- An engineering review of a sample of 12 programme areas – the selected sample is estimated to cost around £1,800 million in SRC27 (2024-25 prices). The list of programmes is provided in Table 11 below.

*Table 11: List of programmes of work from the final business plan included in the sample for an external engineering review*

| Programme number | Description | Service | Total cost in SRC27 (£m; 2024-25 prices) |
|---|---|---|---|
| 1 | Maintain critical and non-critical sewers | Wastewater | 295 |
| 2 | Resolve matters in the interest of safety | Water | 278 |
| 3 | Unsatisfactory Intermittent Discharges programme | Wastewater | 260 |
| 4 | Maintain WTW Chemical Storage and Dosing | Water | 140 |
| 5 | Chlorine Contact Tank Management | Water | 134 |
| 6 | Maintain sludge treatment centres to ensure a quality product: sludge reception & cleaning, digestion & stabilisation, sludge storage, return liquor treatment, thermal drying and pelletising | Wastewater | 122 |
| 7 | Asset maintenance for returning PFI assets (excluding Daldowie) | Wastewater | 118 |
| 8 | Maintain treatment ancillaries including tanks, buildings, instrumentation, washwater, chemical dosing, sampling, tertiary lagoon | Wastewater | 114 |

| Programme number | Description | Service | Total cost in SRC27 (£m; 2024-25 prices) |
|---|---|---|---|
| 9 | Maintain secondary treatment including tanks, septic tanks, activated sludge assets, wet well, instrumentation, BAF filter, reed bed | Wastewater | 112 |
| 10 | Maintain SCADA, HMI, PLC | Water | 97 |
| 11 | Maintain inlet works including inlet, screening, grit removal and storm tanks | Wastewater | 82 |
| 12 | Provision of appropriate equipment and analysis to demonstrate pass forward flow (PFF) spill compliance at WWTW and that flow is maintained during the event duration | Wastewater | 65 |

1.2.61. The total estimated cost of the selected projects and programmes in SRC27 is around £2,434 million or 30% of the total investment programme in the final business plan.

1.2.62. For the West Central Bioresources project review, we asked WSP to answer the following questions. In the consultant's opinion:

- Is the investment need robustly demonstrated and justified?
- Has Scottish Water demonstrated that it has considered all reasonable options to meet the desired outcome? Has Scottish Water considered the 'do nothing' option and set out the costs and risks associated with such an option?
- Are Scottish Water's assumptions on the impact of the new Environmental Authorisation Scotland Regulations (EASR) and the impact on the disposal of sludge to land reasonable, recognising that this appears to be a material factor in Scottish Water deciding to deliver the project in-house?
- To what extent is the West Central Bioresources project consistent with the characteristics of a project that is suitable for a Mutual Investment Model (certainty of need, complexity to allow for a risk transfer at a reasonable price)?
- To what extent are Scottish Water's assumptions of the benefits from a project delivery in-house versus via a Mutual Investment Model reasonable?
- In considering options to meet the desired outcome, how well has Scottish Water considered risk?
- Is the scope of solution proposed appropriate given the desired outcome and Scottish Water's risk tolerance? If the consultant's view is that the proposed solution exceeds what is necessary to meet the desired outcome taking account of either Scottish Water's risk tolerance or a reasonable risk tolerance, then
  - How does the solution exceed what is required to meet the outcome?
  - What would represent an appropriate scope challenge?

- In considering options to meet the desired outcome and in developing the scope of the preferred solution, has Scottish Water taken a holistic planning approach, taking account of wider system/network or catchment management issues and opportunities?
- Is the proposed scope of solution(s) appropriately costed and how do the unit costs/rates compare with similar projects or programmes completed by other water companies? If Scottish Water's unit costs/rates are higher than comparators:

  - Has Scottish Water explained why?
  - What is the consultant's view on Scottish Water's explanation?
  - If applicable, what would represent a reasonable cost challenge?

- Overall, will the proposed project/programme meet the desired outcome most effectively?

1.2.63. Furthermore, the scope of the review should cover some of the requirements the Scottish Government has outlined in its final position paper regarding this investment project and its appraisal.[16] Specifically, we expect the consultant to review whether:

- The investment appraisal complies with HM Treasury's Green Book;
- The proposed solution aligns with the Scottish Government's Infrastructure Investment Plan and draft Bioenergy Policy Statement;
- The investment appraisal appraises options against their economic impact. This includes giving consideration to whole life costs and how capital costs can be shared between current and future customers. The investment case should also consider qualitative or quantitative wider economic benefits of the project;
- The investment appraisal appraises the options for this project against the potential for the solution to integrate with existing policies and plans at the national, regional and local level, e.g. National Planning Framework 4; and
- The investment appraisal appraises the options for the project against a range of environmental factors in line with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.[17] This is to reflect the overall balance of environmental impact and benefits. These include:

  - Population and Human Health;
  - Biodiversity;
  - Land, soil, water, air and climate;

[16] Scottish Government (2025), 'Letter from the Cabinet Secretary for climate action and energy', letter dated 7 November 2025.
[17] The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, Regulation 4(3) and Schedule 4(4) and (5).

- Material assets, cultural heritage and the landscape; and
- Vulnerability of the proposed development to major accidents and disasters.

1.2.64. For the review of the second individual project we asked WSP to answer the following questions. In the consultant's opinion:

- Is the investment need robustly demonstrated and justified?
- Has Scottish Water demonstrated that it has considered all reasonable options to meet the desired outcome? Has Scottish Water considered the 'do nothing' option and set out the costs and risks associated with such an option?
- In considering options to meet the desired outcome, how well has Scottish Water considered risk?
- Is the scope of solution proposed appropriate given the desired outcome and Scottish Water's risk tolerance? If the consultant's view is that the proposed solution exceeds what is necessary to meet the desired outcome taking account of either Scottish Water's risk tolerance or a reasonable risk tolerance, then:
  - How does the solution exceed what is required to meet the outcome?
  - What would represent an appropriate scope challenge?
- In considering options to meet the desired outcome and in developing the scope of the preferred solution, has Scottish Water taken a holistic planning approach, taking account of wider system/network or catchment management issues and opportunities?
- Is the proposed scope of solution(s) appropriately costed and how do the unit costs/rates compare with similar projects or programmes completed by other water companies? If Scottish Water's unit costs/rates are higher than comparators:
  - Has Scottish Water explained why?
  - What is the consultant's view on Scottish Water's explanation?
  - If applicable, what would represent a reasonable cost challenge?
- Overall, will the proposed project/programme meet the desired outcome most effectively?

1.2.65. For the review of 12 investment programmes of work, we expect it to be less in-depth than the project review and to focus on the underlying assumptions used to cost the programme and the efficiency of the proposed costs, answering the following questions. In the consultant's opinion:

- Is the investment need robustly demonstrated and justified?

- Is the scope of solution proposed broadly appropriate to meet that investment need? If the consultant's view is that the proposed solution exceeds what is necessary to meet the desired outcome, then:
  - How does the solution exceed what is required to meet the outcome?
  - What would represent an appropriate scope challenge?
- Is the proposed scope of solution(s) appropriately costed and how do the unit costs/rates compare with similar projects or programmes completed by other water companies? If Scottish Water's unit costs/rates are higher than comparators:
  - Has Scottish Water explained why?
  - What is the consultant's view on Scottish Water's explanation?
  - If applicable, what would represent a reasonable cost challenge?

1.2.66. The findings from the review are summarised in sections 1.3, 1.4 and 1.5.

## 1.3. Review of investment related to drinking water quality and continuity

1.3.1. This section outlines the investment in water quality and water continuity, which Scottish Water proposes to deliver by programme area, and details how WICS has reviewed these proposals by each of the review approaches below:

- Feedback from the Drinking Water Quality Regulator;
- Review of investment cases;
- Review of asset maintenance investment;
- Benchmarking review; and
- External engineering review.

### Summary of Scottish Water's proposals in the final business plan

1.3.2. Table 12 below outlines the investment Scottish Water proposes to deliver in its final business plan in relation to water quality and water continuity.

*Table 12: Business plan investment for water quality and continuity*

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) |
|---|---|---|
| TA001 - Water Quality | Water Treatment | 1,294 |
| TA001 - Water Quality | Water Storage | 318 |
| TA001 - Water Quality | Water Distribution | 64 |
| TA001 - Water Quality | Lead Management | 36 |
| TA001 - Water Quality | Raw Water and Catchment Management | 9 |
| TA002 - Water Continuity | Abstraction, Sources and Raw Water Transfers | 427 |
| TA002 - Water Continuity | Water Treatment | 7 |
| TA002 - Water Continuity | Water Transmission (trunk mains and strategic pipelines) | 99 |
| TA002 - Water Continuity | Water Pumping Stations | 48 |
| TA002 - Water Continuity | Water Distribution | 686 |
| TA002 - Water Continuity | Resilience and Growth | 126 |
| TA002 - Water Continuity | Other Programmes | 377 |
| | **Total** | **3,491** |

### Regulator feedback

1.3.3. We received feedback from DWQR in relation to the water quality investment area.

1.3.4. In its feedback, DWQR explained that it was broadly supportive of the approach taken by Scottish Water and generally agreed with the proposed business plan, which prioritises:

- Compliance with legal duties;
- Resilience of supplies with failsafe arrangements; and
- Acceptability of supplies to consumers.

1.3.5. DWQR explained that the proposed plan goes some way in addressing risk, but risk remains, and focus is required on the operation and maintenance of assets to protect public health.

1.3.6. DWQR set out the main drivers of investment, including:

- Improvements are associated with delivery of a revised disinfection policy, which will require significant improvement over the 2027-33 regulatory period and beyond;
- Inspection and repair of all treated water storage assets, which is the subject of an enforcement notice;
- Maintaining and improving customer acceptability related to discolouration, taste and odour;
- Lead compliance;

- Addressing ageing and deteriorating assets in the face of climate change and more recent regulatory changes; and
- Protection of public health in relation to raw water supplies, with concern that recent information shows the number of supplies significantly exceeding the investment plan.

1.3.7. DWQR issued an enforcement notice to develop and implement an action plan related to its risk assessment methodologies and understanding of significant risks, requiring improvements in these areas.[18] In our engagement with DWQR, it reiterated these concerns and highlighted that Scottish Water may need to reprioritise investment during the 2027-33 regulatory period once Scottish Water has a better understanding of the significant risks.

1.3.8. Through the information provided by DWQR, we consider that there is limited discretionary investment in relation to the water quality programme. Furthermore, investment may need to be reprioritised during the regulatory period, recognising Scottish Water's work to deliver a revised disinfection policy and risk assessment methodologies.

### Review of investment cases

1.3.9. We undertook an engineering review of 27 projects, valued at greater than £6 million, covered by the water quality and water continuity technical appendices. These 27 projects have a combined value of £748 million. The results of our review, assessed against the criteria set out in paragraphs 1.2.21 to 1.2.27, are shown in Table 13.

1.3.10. Of the 27 projects, 22 were assessed with a Green RAG score, meaning these investments are allowed. 3 were assessed with an Amber RAG score, meaning WICS have reservations regarding one or more assessment criteria, and 2 have a Red RAG score, meaning investment may not be allowed.

1.3.11. In our initial assessment, several projects received Red or Amber RAG scores for the regulatory engagement criteria, specifically because no evidence was provided that they were supported by the DWQR. For clarification, WICS was not requiring DWQR approval; rather, only evidence that the solution had been shared with the DWQR and that no objections had been raised. This recognises DWQR's regulatory role and that DWQR will not endorse a specific solution, as outcome risk must sit with Scottish Water as operator. During our review, WICS held bilateral discussions with the DWQR regarding the water quality projects, and the DWQR responded with a note indicating that the need for investment and the solution had been shared across all the projects we have reviewed.[19]

[18] DWQR (2025), 'Water Industry (Scotland) Act 2002 Enforcement Notice Under Section 10 (1)', letter dated 01 December 2025, available at Enforcement, last accessed on 21 April 2026.
[19] Email from DWQR to WICS titled 'WICS/DWQR Bilateral 13 April 2026', dated 20/04/2026.

*Table 13: Assessment summary of water-related project investment cases*

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Primary Technical Appendix | RAG Score: Needs & Options | RAG Score: Regulatory Engagement | RAG Score: Cost Estimate | RAG Score: Benefits & Risk | RAG Score: Overall Assessment |
|---|---|---|---|---|---|---|---|---|
| 5363113077 | SR21 Turriff WTW | 142 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113079 | SR21 Glendevon WTW | 53 | Water Quality | AMBER | GREEN | RED | RED | RED |
| 5363113086 | SR21 Mannofield WTW - Ceramic | 63 | Water Quality | GREEN | GREEN | AMBER | GREEN | GREEN |
| 5363113110 | SR21 Mannofield WTW | 1 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113087 | SR21 Bradan_WTW Future Plan | 50 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110861 | Lomond Scheme - Distributed Control System DCS replacement or renewal | 24 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110875 | Balmore WTW HV Asset Replacement | 12 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113090 | SR21 Stornoway WTW | 49 | Water Quality | GREEN | GREEN | AMBER | GREEN | GREEN |
| 5363113108 | Lintrathen WTW - OT - ASD and Disinfection Upgrades | 11 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113113 | SR21 ASD - Blairlinnans WTW | 12 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113225 | Invercannie 1924 Aqueduct Conduit Replacement | 28 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113405 | Loch Katrine New Aqueduct North End Long Chamber to South End Long Chamber | 22 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110870 | Glenhove TWP - HV Asset Replacement | 7 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363111172 | MA037 Castle Moffat CWT | 12 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113036 | RCI Tiree DMA Sandaig | 6 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113095 | SR21 ES Torra WTW | 6 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Primary Technical Appendix | RAG Score: Needs & Options | RAG Score: Regulatory Engagement | RAG Score: Cost Estimate | RAG Score: Benefits & Risk | RAG Score: Overall Assessment |
|---|---|---|---|---|---|---|---|---|
| 5363113099 | SR21 Camphill WTW | 21 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113111 | SR21 Penwhirn WTW | 25 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113129 | SR21 Glenlatterach WTW | 25 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113139 | SR21 Londornoch WTW | 47 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113179 | Greenock WTW | 12 | Water Quality | GREEN | GREEN | AMBER | GREEN | AMBER |
| 5363113592 | Daer WTW - DEVELOP - Strategic Replacement | 31 | Water Quality | GREEN | GREEN | AMBER | AMBER | AMBER |
| 5363113124 | SR21 Daer WTW | 6 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113593 | Carron Valley WTW - DELIVER - Taste & Odour Improvements | 19 | Water Quality | GREEN | GREEN | RED | RED | RED |
| 5363117623 | Assynt WOA - Maryburgh Trunk Main | 6 | Water Continuity | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113083 | SR21 ES Glenfarg WTW upgrade | 51 | Water Quality | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110889 | Edinburgh Lothians Castle Moffat Hopes - Resilience and Growth | 7 | Water Continuity | AMBER | GREEN | GREEN | AMBER | AMBER |
| | **Total** | **748** | | | | | | |

*Projects assessed with a Red RAG score*

1.3.12. **SR21 Glendevon WTW**. WICS requested further information regarding this project in a formal query on 13th March 2026.[20] Scottish Water replied to the query; however, we still have reservations in respect to several assessment criteria.

1.3.13. The reasons for the Red RAG score for Glendevon water treatment works (WTWs) project are:

- Needs & Options: not all needs/risks set out in the Stage 1 PIA, which are based on the DWQR Needs Statement, will be addressed by the proposed solution.
- We assess that the £54 million budget in the final business plan appears low relative to the proposed solution and there is a risk that the benefits of the project will not be realised. The scope of the recommended option (Option 9a) includes:
  - Installation of auto-shutdown system;
  - An additional clear water tank; and
  - Replacement of the existing rapid gravity filter plant with a ceramic membrane filtration plant.

1.3.14. Our assessment of the capital cost for the proposed scope at Glendevon WTW, which is a large 91Ml/d plant, is that there is a material risk of cost escalation from the forecast in the business plan, meaning that the proposed scope and the full benefits may not be delivered in SRC27.

1.3.15. **Carron Valley WTW – DELIVER – Taste & Odour Improvements**. WICS requested further information regarding this project in a formal query on 20th March 2026.[21] Scottish Water replied to the query; however, we still have reservations regarding our assessment of the cost estimation criteria.

1.3.16. The reasons for the Red RAG score for Carron Valley WTW project are:

- The investment is included in the final business plan because it is included in Scottish Water's Letter of Commitment (LoC) to the DWQR to address a "high risk" of exceeding the standard for disinfection by-products, specifically haloacetic acid (HAA).
- The Stage 3a PIA, included in the evidence base, proposes process maximisation work and the addition of an enhanced organics removal process to reduce the total organics content and, hence, disinfection by-product formation (including HAAs).
- In its query response, Scottish Water stated that "*Subsequent pilot plant studies identified the potential to deliver a more cost-effective solution (still based on ozone)*

[20] WICS query reference 03-09 issued 13/03/2026 and reply from Scottish Water dated 03/04/2026
[21] WICS query reference 04-10 issued 20/03/2026 and reply from Scottish Water dated 31/03/2026

*for addressing the T&O issues*" and confirmed the £19 million final business plan budget as being sufficient for this purpose.

- However, WICS see no evidence that the budget of £19 million will be sufficient to provide a solution, on a 125Ml/d WTW, that would provide enhanced organics removal and address the "high risk" of haloacetic acid exceedances in customers' water supply.

1.3.17. If a more comprehensive solution is required at Carron Valley WTW to address the "high risk" of haloacetic acid exceedances in customers' water supply, we have concerns that investment to address taste and odour issues will be insufficient and will not be a good use of customers' money.

*Projects assessed with an Amber RAG score*

1.3.18. **Greenock WTW**. The project assumes enhanced organics removal is required to reduce disinfection by-products, specifically haloacetic acid, as required by the LoC with the DWQR. WICS notes that the final business plan budget of £12 million appears low compared to the cost estimates for other organics removal projects.

1.3.19. **Edinburgh Lothians Castle Moffat Hopes - Resilience and Growth**: The purpose of this project is to address a current and worsening Supply-Demand Balance (SDB) in the Edinburgh and Lothians water resources zones. The project investment appraisal[22] notes that the latest best cost estimate is £100 million, and the Gate 90 date is in 2035, so the main investments that could result from this project are not planned for SRC27. In a formal query, WICS asked Scottish Water how the £7 million final business plan budget would be spent towards achieving the aims of this project. Scottish Water advised that the SRC27 scope would include project development work such as physical investigations and modelling.[23]

1.3.20. This project is scored Amber for both the Needs & Options and the Benefits & Risk assessment to reflect concern that a lack of tangible or well-defined objectives for SRC27 could result in insufficient progress achieved in SR27. WICS proposes to monitor progress on this important strategic project to ensure the available funding is used to address the need for long-term continuity of water supply to customers in the Edinburgh and Lothian area.

1.3.21. **Daer WTW - DEVELOP - Strategic Replacement project**: Daer is a 75-year-old WTW with a need to address water quality deficiencies. The project investment appraisal, which was instigated following an Enforcement Notice from DWQR, concludes that the most economically viable whole-life-cost strategy for Daer WTW is replacement with improved

[22] Scottish Water (2024), 'Stage 1: Case for Change Level 2 – Edinburgh & Lothians, Castle Moffat & Hopes Resilience', September 2024, p. 13, submitted with the final business plan on 26 February 2026.
[23] WICS query reference 05-08 issued 27/03/2026 and reply from Scottish Water dated 03/04/2026

water treatment technology at a new works. The reasons for the amber RAG score is as follows:

- Scottish Water has recognised this in the final business plan by including a budget of around £31 million "to undertake the initial options appraisal for the strategic replacement of Daer WTW and the subsequent detailed design of the preferred option by the end of SR27 for delivery in SR33, subject to available financing against other priorities to be determined through the business plan process for SR33."[24]
- WICS have concerns that without a well-defined programme showing how the project will be implemented over SRC27 and SRC33, the development of this project will leave insufficient progress towards realising the longer-term project benefits – hence the Amber RAG score. WICS proposes to monitor progress on this important strategic project to ensure customers can see progress towards the longer-term benefits that will eventually be delivered.
- In addition, WICS are concerned that the cost proposed of £31 million for the initial assessment of options and detailed design is higher than industry norms for detailed design, which we would normally expect to be in the range 4% - 6% for estimated capital cost, i.e. not more than £18 million.

1.3.22. There are 2 projects we have assessed as Green for the overall RAG score and Amber only for Cost Estimation. In these 2 projects, we have noted that the final business plan budget is below the cost estimate presented in the latest project investment appraisal. We queried Scottish Water for further information on these differences; however, Scottish Water assured us that they are comfortable with the proposed budget. Whilst the final business plan estimate may be reasonable, the Amber RAG score reflects a risk of cost escalation for these projects in the SRC27 regulatory period. The two projects with such cost estimation differences are:

- SR21 Mannofield WTW – Ceramic: £76.0 million in appraisal and £64.4 million in the final business plan.[25]
- SR21 Stornoway WTW: £60.5 million in the appraisal and £50.2 million in the final business plan.[26]

*Conclusions reflected in the main draft determination document*

1.3.23. Our assessment for the draft determination is that we propose to retain the allowances for both Glendevon water treatment works and Carron Valley, but require confirmation from Scottish Water in the following areas:

[24] WICS query reference 06-07 issued 02/04/2026 and reply from Scottish Water dated 09/04/2026
[25] WICS query reference 05-07 issued 27/03/2026 and reply from Scottish Water dated 09/04/2026
[26] WICS query reference 03-11 issued 13/03/2026 and reply from Scottish Water dated 20/04/2026

- For Glendevon, we require Scottish Water to confirm the project needs and whether the full scope will be met for the proposed costs; and
- For Carron Valley, we require that Scottish Water confirm the project needs and whether the solution relates to taste and odour only, or taste and odour and haloacetic acids. If it is only taste and odour, we require confirmation that the investment will not be redundant and that the proposed investment is consistent with a low regrets/least regrets pathway.

1.3.24. We will revisit both projects in our final determination and may remove them if Scottish Water is unable to provide the necessary assurances.

1.3.25. For the Daer water treatment works, we propose reducing the allowance by £13.4 million to £18 million, recognising that this should be sufficient to cover the assessment of the option selection and detailed design for a project of this size.

### Review of asset maintenance investment

1.3.26. Table 14 lists the reviewed Management Approaches, which cover investments mostly related to water services along with WICS' RAG assessment. The 3 Management Approaches highlighted in orange (namely, MA022, MA114, and MA119) were excluded from our internal review as they cover programmes of work which were included in the external engineering review by WSP. The following paragraphs detail the assessment of each of the remaining 9 MAs.

*Table 14: Management Approaches relating mostly to Water service*

| MA number | MA Name | Value in SRC27 (2024-25 prices; £m; post-efficiency) | Primary Service | Proportion of value in SRC27 for water | Proportion of value in SRC27 for wastewater | Proportion of value in SRC27 for shared assets | WICS assessment |
|---|---|---|---|---|---|---|---|
| MA016 | Network Water Quality | 60 | Water | 51% | 0% | 49% | Green |
| MA022 | SCADA PLC HMI | 130 | Water | 100% | 0% | 0% | |
| MA033 | Water Filtration | 92 | Water | 100% | 0% | 0% | Amber |
| MA058 | Water Pumping Stations | 48 | Water | 88% | 0% | 12% | Red |
| MA063 | Water Resources Environmental Monitoring & Compliance | 45 | Water | 100% | 0% | 0% | Amber |
| MA073 | Distribution Infrastructure - Metering and Flow Monitoring | 41 | Water | 100% | 0% | 0% | Red |
| MA094 | WTW Process Stages Mechanical & Electrical | 59 | Water | 100% | 0% | 0% | Amber |
| MA095 | WTW Water Quality Instrumentation | 57 | Water | 100% | 0% | 0% | Amber |
| MA111 | Water Distribution Mains | 554 | Water | 100% | 0% | 0% | Amber |
| MA114 | Water Treatment, Chemical Storage and Dosing | 143 | Water | 100% | 0% | 0% | |
| MA116 | Strategic Water Infrastructure | 150 | Water | 100% | 0% | 0% | Green |
| MA119 | Treated Water Storage and Chlorine Contact Tanks and Pipes | 441 | Water | 70% | 30% | 0% | |
| | **Total** | **1,820** | | | | | |

### *MA016 Network Water Quality*

1.3.27. Management Approach 16 relates to the management of water discolouration within the network. Scottish Water is proposing to maintain its policy for the 2021-27 regulatory period.

1.3.28. Scottish Water proposes to spend £60 million (2024-25 prices) on interventions relating to water discolouration over the 2027-33 regulatory period.

1.3.29. We observed differences in unit costs for mains replacement between the final business plan and the management approach policy. Scottish Water explained these differences.

1.3.30. We also noted that this management approach includes an additional £30 million in investment to reduce customer contacts for discolouration and taste and odour issues, which is a concern for the DWQR.

1.3.31. We propose no further cost challenge in this area based on the following points:

- we are applying an additional challenge to performance on the outcome measures for customer contacts for discolouration, taste and odour issues and interruptions to supply and leakage, which will all be affected by mains replacement; and
- the DWQR's concerns regarding discolouration, taste and odour.

1.3.32. Table 15 provides our draft allowance.

*Table 15: Draft Determination allowance for MA016 Network Water Quality*

| MA016 Network Water Quality | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £60m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £60m |
| Draft outputs to be delivered over 2027-33: Length of potable water mains replaced (km) | 37 |

### *MA033 Water Filtration*

1.3.33. Management Approach 33 covers the following water filtration assets:

- Sand filters, which it assumes are refurbished at condition grade 4, which is assumed to correspond to 14 years;
- Membranes, which it assumes are refurbished at condition grade 4, which is assumed to correspond to 4 years; and
- Granular Activated Carbon (GAC) filters, which it assumes are refurbished at condition grade 4, which is assumed to correspond to 1 or 4 years, depending on asset life.

1.3.34. The management approach indicates that for all filtration assets, Scottish Water will undertake reactive replacements and inspections in response to unforeseen performance events.

1.3.35. Scottish Water proposes to spend £92 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.3.36. The policy trigger is refurbishment at condition grade 4, yet there is currently no asset condition data available and no modelled deterioration curves for membrane, sand or GAC filter assets, resulting in reliance on high-level assumptions.

1.3.37. Scottish Water's management approach clearly sets out its assumptions for the unit costs and the number of filters refurbished. However, our assessment is that the unit costs and the rate of asset refurbishment could be based on more comprehensive information.

1.3.38. For example, the assumed unit costs for GAC filters is based on 3 projects. Furthermore, the assumed unit costs for the refurbishment of sand filters (£185,000) is based on a weighted average of three standard refurbishments at a cost of £80,000 each and one major refurbishment at a cost of £500,000. The cost of the standard refurbishment is derived based on actual outturn costs from the 2021 refurbishment programmes in the East and North. However, the cost of the major refurbishment is based on the estimated or actual costs for 8 major projects, with an average of around £390,000. The average unit cost for projects with actual costs is around £325,000. If this cost is used in the weighted-average unit costs for sand filters, then it reduces unit cost to around £140,000 rather than £185,000.

1.3.39. We considered applying a cost challenge based on this updated estimate for sand filters, recognising the general theme across the management approach of basing cost information on limited observations across all three filter types. However, we have decided not to apply such a challenge at this stage. We may revisit this for our Final Determination. Table 16 provides our draft allowance.

*Table 16: Draft Determination allowance for MA033 Water Filtration*

| MA033 Water Filtration | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £92m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £92m |
| Draft outputs to be delivered over 2027-33: Number of filters and membranes replaced | 507 |

### *MA058 Water Pumping Stations*

1.3.40. Management Approach 58 covers the following assets:

- Critical pumping station MEICA equipment, where condition-based performance monitoring will be introduced to proactively intervene when monitoring indicates that the asset is nearing the end of life. Large assets will be refurbished where possible to extend asset life prior to replacement, whereas small assets will be replaced;
- Non-critical pumping station MEICA equipment, which will be responsively replaced when assets fail;
- Critical pumping station civil assets, where there will be an intervention when assets are at a condition grade 5 and will be refurbished to extend life where possible; and
- Non-critical pumping station civil assets, where there will be an intervention when assets are at a condition grade 5 and will be refurbished to extend life where possible.

1.3.41. Scottish Water is proposing to spend £48 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.3.42. The management approach includes information on unit costs and the number of interventions. For example, the management approach provides the following assumption on average unit costs:

- Pump replacement: £100,000 (small) to £180,000 (large), with an additional 20% uplift for responsive replacements to cover the cost of temporary works;
- Pump refurbishment: £60,000 (small and large); and
- Pump repair: £10,000 (small) to £20,000 (large).

1.3.43. The final business plan includes investment of £48 million to deliver 160 asset interventions (a repair, refurbishment, or replacement), which results in a unit cost of around £300,000 per intervention.

1.3.44. We recognise that the £300,000 may include other activities associated with water pumping stations. However, we judge it high recognising:

- the highest intervention cost, which would be around £220,000 for a responsive replacement of a large pump (£180,000 with the additional 20% uplift); and
- the 160 interventions in the final business plan will comprise different interventions such as repairs and refurbishments at pumps of different sizes, all of which we would expect to be lower cost than the £220,000.

1.3.45. Given these points, we consider an additional cost challenge of 10% to be reasonable and acknowledge that other factors, such as differences in the price base and other activities, could explain some of the difference between the £300,000 (2024-25 prices) and the highest intervention cost. This results in a cost challenge of around £5 million, as set out in Table 17.

*Table 17: Draft Determination allowance for MA058 Water Pumping Stations*

| MA058 Water Pumping Stations | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £48m |
| Cost challenge (2024-25 prices) | -£5m |
| Draft allowance (2024-25 prices) | £43m |
| Draft outputs to be delivered over 2027-33: Number of water pump interventions | 160 |

### *MA063 Water Resources Environmental Monitoring & Compliance*

1.3.46. Management Approach 63 covers 524 measuring and monitoring points and the various meters, pressure transducers, probes and data loggers associated with each.

1.3.47. Scottish Water proposes segmenting its approach into critical and non-critical assets. Critical assets will be replaced 1 year before the expected end of asset life. Non-critical assets will be replaced in a responsive manner following asset failure.

1.3.48. Scottish Water is proposing to spend £45 million in this area over the 2027-33 regulatory period.

1.3.49. The evidence supporting the asset maintenance investment is limited. The number of assets and interventions does not appear consistent throughout the management approach. There is also limited information disaggregating electromagnetic flow meters by size, which makes it difficult to test the reasonableness of assumptions. However, we note that asset maintenance investment represents a smaller proportion of the proposed investment (around £6 million of £45 million). Therefore, on materiality grounds, we judge that no further cost challenge is appropriate in this area. We may revisit this for our Final Determination.

1.3.50. Table 18 provides our draft allowance.

*Table 18: Draft Determination allowance for MA063 Water Resources Environmental Monitoring & Compliance*

| MA063 Water Resources Environmental Monitoring & Compliance | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £45m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £45m |
| Draft outputs to be delivered over 2027-33: Number of sites with interventions | 1,301 |

### *MA073 Distribution Infrastructure - Metering and Flow Monitoring*

1.3.51. Management Approach 73 covers meters, flow monitoring and Pressure Reduction Valves (PRVs) where critical assets will be refurbished or replaced depending on meter performance and non-critical assets will be responsively refurbished or replaced on asset failure.

1.3.52. Scottish Water is proposing to spend £41 million in this area over the 2027-33 regulatory period.

1.3.53. Our review of the final business plan shows that Scottish Water plans to deliver 8,726 maintenance interventions, which suggests a unit cost of around £4,900 per intervention (2024-25 prices). However, the management approach includes an allocation of £48 million to deliver around 22,000 maintenance interventions over the same period, which suggests a unit cost of around £2,200 per intervention (price base unclear from the management approach). As such, the cost per intervention in the final business is around twice that in the management approach. This suggests that the forecast cost in the final business plan is too high, and a further cost challenge is reasonable.

1.3.54. However, we also recognise that we are setting Scottish Water a more challenging forecast for the leakage outcome measure, and that there may be some interaction between the proposed investment and this measure (e.g., the maintenance of pressure-reduction valves). Balancing these different factors, we propose applying a smaller challenge of 10%, as set out in Table 19.

*Table 19: Draft Determination allowance for MA073 Distribution Infrastructure - Metering and Flow Monitoring*

| MA073 Distribution Infrastructure - Metering and Flow Monitoring | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £41m |
| Cost challenge (2024-25 prices) | -£4m |
| Draft allowance (2024-25 prices) | £37m |
| Draft outputs to be delivered over 2027-33: Number of leakage management equipment interventions | 8,726 |

### *MA094 WTW Process Stages Mechanical & Electrical*

1.3.55. Management Approach 94 covers water treatment works (WTW) mechanical and electrical (M&E) process assets, which will be responsively replaced on failure (condition grade 5). Scottish Water will also:

- Undertake planned interventions where a responsive approach is no longer economically viable or practicable;

- Subject assets to regular operational visual checks to identify condition, performance and health and safety issues;
- Intervene to mitigate as far as reasonably practicable all health and safety risks with the potential to breach the preferred risk appetite; and
- Hold spares or implement other control measures on critical systems/equipment.

1.3.56. Scottish Water proposes to spend £59 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.3.57. Our assessment is that the unit costs and some other key underpinning assumptions could be based on more comprehensive information. We also note that the chosen option relies on the assumption that all WTW process M&E assets are non-critical, which the management approach explains "is understood to be incorrect, however there is insufficient information available at present to determine which assets should be considered critical."[27] We note the management approach suggests that critical assets likely constitute a small proportion (estimated as 1-2%) of the asset base and that the chosen option provides for planned interventions for these assets.[28] We nevertheless agree with the recommendation "that asset criticality is reviewed to determine if an alternative policy option, such as planned replacement, would be more appropriate."[29]

1.3.58. In addition, the current condition of WTW process M&E assets is unknown. The management approach assumes a single-step deterioration profile and that all assets have a lifetime of 25 years. We agree with the proposed improvement actions for the management approach to gather condition data for all WTW process M&E assets and to develop deterioration curves for each asset equipment type.

1.3.59. Given data limitations, which the management approach acknowledges, we are proposing no cost challenge in this area. However, we require improvements to the data underpinning the management approach, including, but not limited to, the project data used to underpin unit costs and asset criticality categorisation. Table 20 provides our draft allowance.

*Table 20: Draft Determination allowance for MA094 WTW Process Stages M&E*

| MA094 WTW Process Stages M&E | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £59m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £59m |

[27] Scottish Water (2025), 'Summary Management Approach WTW Process Stages Mechanical and Electrical MA094', April 2025, p.39.
[28] Scottish Water (2025), 'Summary Management Approach WTW Process Stages Mechanical and Electrical MA094', April 2025, p.32.
[29] Scottish Water (2025), 'Summary Management Approach WTW Process Stages Mechanical and Electrical MA094', April 2025, p.33.

| | |
|---|---|
| Draft outputs to be delivered over 2027-33: Number of WTW process stages M&E interventions | 4,058 |

*MA095 WTW Water Quality Instrumentation*

1.3.60. Scottish Water's Management Approach 95 covers water quality (WQ) instrumentation assets, both at water treatment works and within the network. These assets will be responsively replaced at the end of condition grade 4, which is assumed to be at an approximate age of 15 years. The assets will also undergo calibration and servicing.

1.3.61. Scottish Water proposes to spend £57 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.3.62. The policy involves replacement at the end of condition grade 4, but there is no condition data, resulting in reliance on age-based deterioration profiles.

1.3.63. The total investment proposed in Table X for the 2027-33 period is almost 3 times higher than the total investment over the 2021-27 period. We also note a difference between the total investment proposed in Table X for the 2027-33 period (£60m; 2024-25 prices) and the forecast investment implied by the management approach (£42m; outturn).[30] We asked Scottish Water about this as part of the business plan query process. Scottish Water confirmed that additional investment has been included in the final business plan as a result of input from DWQR on the level of ambition in the draft business plan. As such, additional funding has been allocated to reduce compliance risk following DWQR's feedback.

1.3.64. We have concerns about the cost efficiency of the proposed investment in this area; however, we are aware that the Drinking Water Quality Regulator for Scotland (DWQR) has wider concerns over the lack of disinfection monitoring. As such, we have decided against applying a further cost challenge. Nonetheless, we emphasise the need to improve the data underpinning this management approach. We may revisit this for our Final Determination.

1.3.65. Table 21 provides our draft allowance.

*Table 21: Draft Determination allowance for MA095 WTW Water Quality Instrumentation*

| MA095 WTW Water Quality Instrumentation | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £57m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £57m |
| Draft outputs to be delivered over 2027-33: Number of WTW instrumentation interventions | 1 |

[30] This £42m is calculated by multiplying the average of 2028 and 2029 investment on MA095 page 37 by 6.

*MA111 Water Distribution Mains*

1.3.66. Management Approach 111 covers 44,300km of non-strategic mains. This management approach sets out that Scottish Water will continue annual return 2024 (AR24) service levels with respect to bursts and interruptions to customers.

1.3.67. Scottish Water is proposing to spend £554 million in this area over the 2027-33 regulatory period.

1.3.68. We identified concerns with how elements of this estimation have been developed. In particular, Scottish Water has allocated £40 million annually to responsive burst repair. However, when we attempted to reconstruct this value using the historical burst rate and the reported cost per burst contained within the management approach document, we calculated a figure of £20 million. We submitted a query to Scottish Water on this through the business plan query process. Scottish Water confirmed the value of £40 million, explaining that this represents the totality of reactive distribution network costs and not solely the unit cost of burst main repairs that is in the Management Approach. The broader range of activities included in the business plan includes:

- Inlet and outlet pipework associated with treated water pumping stations;
- Service pipes up to the property boundary box;
- External stop valves and associated fittings; and
- Network telemetry and valve installations delivered alongside responsive works

1.3.69. As a result of Scottish Water's query response we have not applied a cost challenge in this area, especially considering that we are setting Scottish Water a more challenging forecast for the leakage outcome measure, and that there may be some interaction between the proposed investment and this measure.

1.3.70. Table 22 provides our draft allowance.

*Table 22: Draft Determination allowance for MA111 Water Distribution Mains*

| MA111 Water Distribution Mains | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £554m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £554m |
| Draft outputs to be delivered over 2027-33: Km of water distribution mains replaced | See Table 37 for km of water distribution mains replaced |

1.3.71. We also cover water distribution mains in the next sub-section as part of our benchmarking. However, as set out, the cost of repairing bursts is not included in that assessment and we propose applying no further cost challenge to water distribution mains.

*MA116 Strategic Water Infrastructure*

1.3.72. Management Approach 116 covers the following assets:

- Raw water mains, critical trunk mains and subsea mains, which will be proactively refurbished and replaced depending upon condition;
- Aqueducts, which will be refurbished depending on asset age; and
- Non-critical trunk mains, which will be replaced after failure.

1.3.73. Scottish Water proposes spending £150 million on maintaining these assets during the 2027-33 regulatory period.

1.3.74. Scottish Water's proposed spend is below the level required by the management approach and the replacement rate based on expected asset life. Scottish Water has explained that it will create guidance for how this discrepancy will be managed by December 2026. Subject to this guidance being created, we are satisfied with how Scottish Water will manage this difference.

1.3.75. We therefore propose no further cost challenge in this area.

1.3.76. Table 23 sets out our draft allowance in this area.

*Table 23: Draft Determination allowance for MA116 Strategic Water Infrastructure*

| MA116 Strategic Water Infrastructure | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £150m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £150m |
| Draft outputs to be delivered over 2027-33: Km of trunk mains and raw water mains replaced | 23 |

### Benchmarking

1.3.77. Table 24 sets out the investment areas subject to benchmarking for water quality and continuity and our assessment.

*Table 24: Assessment summary of water-related areas suitable for benchmarking*

| Area | Programme | Sub-area ("Investment Area") | Sub-area investment (2024-25 prices; £m) | WICS Assessment |
|---|---|---|---|---|
| Water Quality | Lead Management | Lead Communications Pipe Replacement | 35 | Cost challenge proposed |

| | | | | |
|---|---|---|---|---|
| Water Continuity | Water Distribution | Maintain distribution mains - Accelerated Asbestos Cement water mains replacement | 143 | No cost challenge proposed |
| Water Continuity | Water Distribution | Maintain distribution mains | 392 | No cost challenge proposed on mains replacement |
| Water Continuity | Other Programmes | Follow market best practice metering requirements | 7 | Cost challenge proposed |
| | | **Total** | **577** | |

*Lead communications pipe replacement*

1.3.78. We have benchmarked the costs for Scottish Water's lead communications pipe replacement using Ofwat's PR24 lead enhancement expenditure models. Both models use the number of lead communication pipes replaced or relined to explain differences in the efficient investment in replacing or relining them.[31]

1.3.79. For the unit cost model, we apply two adjustments:

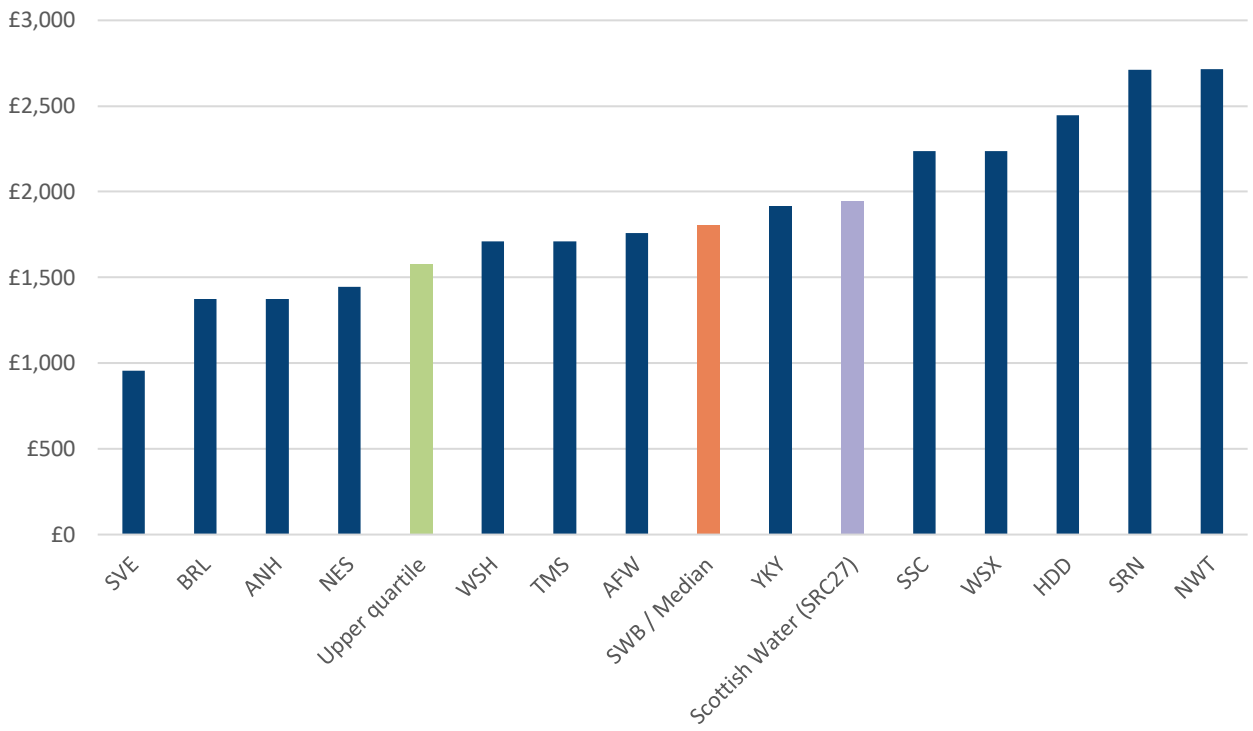
- Converting the England and Wales forecast investment over the PR24 period (covering the years 2025-30) to 2024-25 price bases using CPI inflation; and
- Including Scottish Water as an observation.

1.3.80. Figure 1 shows the forecast unit cost of lead communication pipe replacement for Scottish Water and the companies in England and Wales, based on £ per communication pipe replaced or relined.[32]

[31] Data for the companies in England and Wales is from Ofwat (2024), 'PR24-FD-CA36-Water-Lead-enhancement-expenditure-model', 12 December 2024. Data for Scottish Water is from Table X of the Business Plan data tables submitted to WICS.

[32] The analysis excludes Portsmouth Water, which Ofwat removed as an outlier. WICS has also excluded both South East Water and Sutton and East Surrey as neither company reported forecast investment over 2025-30.

*Figure 1: Forecast unit cost of lead communication pipe replacement (2024-25 prices): £ per pipe*




1.3.81. The unit costs in Figure 1 shows that Scottish Water's costs are above both the upper quartile and the median company in Great Britain. Table 25 shows the results of the unit cost models and Scottish Water's assessed efficiency score based on the median company.[33]

*Table 25: Scottish Water efficiency based on unit cost models for lead communication pipes replacement*

| Lead communication pipes replacement | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £35.0m |
| Number of lead communication pipes to be replaced | 18,000 |
| Scottish Water forecast unit cost per pipe (2024-25 prices) | £1,946 |
| Median Unit cost in GB (2024-25 prices) | £1,804 |
| Upper Quartile cost in GB (2024-25 prices) | £1,578 |
| Scottish Water assessed efficiency score relative to median | 1.08 |

1.3.82. For the econometric model, we apply two adjustments to Ofwat's forecast model:

- examining forecast investment and number of lead communication pipes replaced or relined over the regulatory period (2025-26 to 2029-30 for the companies in England and Wales and 2027-28 to 2032-33 for Scottish Water), rather than annually; and

[33] Scottish Water reports the same values in 2022-23 prices in Table 53 of Technical Appendix 12; however, the numbers align when presented in the same price base. Scottish Water (2026), 'Technical Appendix 012 – Efficiency', 26 February 2026, p.119.

- including Scottish Water as an observation.

1.3.83. We set out the results of the econometric model in Table 26.

*Table 26: Lead communication pipes replacement model*

| Lead communication pipes replacement | Values |
|---|---|
| Ln (Lead communication pipes replaced) (Nr) | 0.94***[34] |
| Constant | -5.89*** |
| Adjusted R-squared | 0.93 |
| Observations | 15 |
| Scottish Water forecast unit cost per pipe (2024-25 prices) | £1,946 |
| Median Unit Cost (2024-25 prices) | £1,820 |
| Scottish Water assessed efficiency score relative to median | 1.07 |

1.3.84. Scottish Water considers that the model effectively assumes that all relevant factors impacting a company's costs of replacing lead communication pipes can be captured in a single variable: the number of lead communication pipes to be replaced. Scottish Water notes that other factors may also impact a water company's costs, such as population density and that Ofwat tested such factors in developing the model but did not find them statistically significant.

1.3.85. We note from Figure 1 that companies with similar operating characteristics to Scottish Water, such as Dwr Cymru, Northumbrian Water, and Yorkshire Water, which serve large rural areas as well as densely populated cities, forecast lower costs per lead communication pipe replaced. Furthermore, Scottish Water has not provided evidence to demonstrate that it faces higher costs in these areas due to factors outside management control. As such, we consider that a cost challenge representing 'catch-up' is appropriate in this area.

1.3.86. Both the unit cost and econometric models provide similar efficiency scores for Scottish Water. Furthermore, we consider that the econometric model performs well from both statistical and operational/engineering perspectives, with the coefficient having the expected sign. Given these factors, we could set a cost allowance based on the upper quartile level. However, at this stage, we propose applying a cost challenge based on the median unit cost from the unit cost model (i.e. the higher of the two estimates) in the event that other factors beyond management's control are not captured in the model and affect Scottish Water's costs.

1.3.87. Our draft allowance is set out in Table 27.

[34] *** denotes significance at the 0.1% level, which means that we can have 99.9% confidence that lead communication pipes replaced explains the level of investment in this area.

*Table 27: Draft Determination allowance for lead communication pipes*

| Lead communication pipes replacement | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £35m |
| Cost challenge (2024-25 prices) | -£3m |
| Draft allowance (2024-25 prices) | £32m |
| Draft outputs to be delivered over 2027-33: Number of lead communication pipes replaced | 18,000 |

1.3.88. This is slightly lower than the cost challenge implied from Scottish Water's calculated efficiency score in technical appendix 12.

### *Water mains replacement*

1.3.89. We have used Ofwat's PR24 data sets to benchmark Scottish Water's forecast mains replacement investment, covering both the replacement of Asbestos Cement water mains and other material types. We examined the scope to benchmark these materials separately; however, the data sets for the water companies in England and Wales do not provide a breakdown of mains replacement investment by material type.

1.3.90. The cost of mains replacement investment per metre for the median efficient company in England and Wales is £300 per metre in 2022-23 prices, or £324 per metre in 2024-25 prices.[35] Table 28 shows Scottish Water's unit cost of water mains replacement investment compared to the unit cost of the median efficient company in England and Wales.

*Table 28: Scottish Water efficiency based on unit costs for water mains investment*

| Water mains replacement | Value |
|---|---|
| Scottish Water forecast water mains investment expenditure (2024-25 prices) | £555m[36] |
| Scottish Water forecast mains replacement investment (2024-25 prices) | £314m[37] |
| Length of mains to be replaced (kilometres) | 1,214 |
| Scottish Water forecast unit cost per metre (2024-25 prices) | £259 |
| Median Unit cost per metre in England and Wales (2024-25 prices) | £324 |
| Scottish Water assessed efficiency score relative to the median unit cost | 0.80 |

1.3.91. Scottish Water has allocated £314 million of the forecast water mains investment to mains replacement, with the remainder relating to repairs for bursts. Our assessment of the repairs

[35] The £300 per metre is set out in Ofwat (2025), 'PR24-FD-CA34-Water-Leakage-enhancement-expenditure-model-v3-1', 26 February 2025.

[36] This figure is higher than the sum of the sub areas: "Maintain distribution mains - Accelerated Asbestos Cement water mains replacement" and "Maintain distribution mains" because it contains expenditure from two other sub areas which contribute to mains replacement.

[37] £314m of Scottish Water's forecast water mains investment of £555m relates to mains replacement, with the remainder relating to repairs from bursts.

expenditure is covered in the review of Management Approach 111 (see paragraphs 1.3.66 to 1.3.71).

1.3.92. As shown in Table 28, Scottish Water's assessed efficiency score is 0.80, indicating that its costs are 20% lower than those of the median-efficient company in England and Wales. We therefore propose to apply no catch-up efficiency challenge related to mains replacement investment.

1.3.93. However, based on our benchmarking analysis, we do consider that Scottish Water could deliver further leakage benefits from its forecast water mains investment as set out in chapter 4 of the Draft Determination.

1.3.94. Our draft allowance and forecast outputs is set out in Table 29.

*Table 29: Draft Determination allowance for water mains investment*

| Water mains replacement | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £314m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £314m |
| Draft outputs to be delivered over 2027-33: km of Asbestos Cement water mains replaced | 614 |
| Draft outputs to be delivered over 2027-33: km of other water mains replaced | 599 |

### *Metering*

1.3.95. We have used Ofwat's PR24 datasets to benchmark Scottish Water's forecast investment in smart meter upgrades and new installations. Scottish Water proposes in its final business plan to spend around £60 million to upgrade 130,000 meters at non-domestic premises with smart ones, and to spend around £7 million to install 4,920 smart meters at first-time registered non-domestic properties during the SRC27 period.[38] This results in unit costs of £463 per meter for upgrades and £1,358 per meter for new installations, or a combined unit cost of £495 per meter (all 2024-25 prices). Scottish Water has also compared these costs to the median unit costs in England and Wales in Annex B of technical appendix 12[39] where it shows the significant difference to the median unit costs for meter upgrades (£88 per meter in 2022-23 prices, or £95 in 2024-25 prices) and for new meter installs (£414 per meter in 2022-23 prices or £448 in 2024-25 prices) in England and Wales.[40]

[38] As per final business plan data table 5, lines P-5363112530 and P-887-Planned respectively.
[39] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 – Efficiency', 26 February 2026, p. 123.
[40] See also Ofwat (2024), 'Water enhancement expenditure model PR24CA32: Metering', republished on 26 February 2025. Available at https://www.ofwat.gov.uk/wp-content/uploads/2025/02/PR24-FD-CA32-Water-Metering-enhancement-expenditure-model-v3-1.xlsx, accessed from page https://www.ofwat.gov.uk/regulated-companies/price-review/2024-price-review/final-determinations-models/, section '8. Enhancement feeder models – Water'.

1.3.96. Scottish Water provided two main reasons for this significant difference. Firstly, Scottish Water considers that it currently lacks the economies of scale in meter deployment achieved by companies in England and Wales. Secondly, Scottish Water considers that its planned non-household meter upgrades are lower in volume and more geographically dispersed than those of companies in England and Wales. Scottish Water explains that Ofwat's modelling does not sufficiently account for these two factors, which explains the material difference from the benchmark.

1.3.97. We also asked our engineering consultants, WSP, to review the programme for installing smart meters at non-household premises. Paragraphs 1.3.110 to 1.3.113 set out the results from that review and the cost challenge we have applied in this area.

### External engineering review of the business plan

*Review following the draft business plan submission*

1.3.98. Following the draft business plan submission, WSP reviewed one water project and one water programme.

1.3.99. The project review related to the Black Esk Water Treatment Works project, which started in the 2021-27 regulatory period and has an estimated total value in SRC27 of around £10 million in the draft business plan. WSP considered the proposed investment solution to be technically sound and aligned with strategic needs. However, they outlined concerns about unclear cost escalations across project appraisal stages, potentially due to insufficient risk or optimism bias in earlier appraisal stages, and a lack of transparency in assessing carbon emissions. Nevertheless, WSP did not identify an overall cost challenge, as most contractor-estimated costs were relatively mature and aligned with benchmarks.

1.3.100. The programme review was for maintaining treated water storage tanks, with an estimated total value of around £390 million (2023-24 prices) in the draft business plan, equivalent to £400 million in 2024-25 prices. WSP considered that the programme meets DWQR's requirements in terms of scope. However, WSP recommended a more detailed cost-estimation approach, as the unit rates for refurbishment and replacement exceed industry benchmarks. WSP identified a potential cost challenge of £50 million to £100 million, which may be reduced if further robust cost justification is provided.

*Review following the final business plan submission*

1.3.101. The project on Black Esk water treatment works has since started on site with construction now underway. As such, we have not re-examined the project.

1.3.102. We have further reviewed the treated water storage programme in the final business plan submission as explained in the following paragraphs.

1.3.103. From our review of the final business plan, we note that Scottish Water has reduced the investment in maintaining treated water storage tanks from £400 million in 2024-25 prices in the draft business plan to £290 million in the final business plan. We asked Scottish Water how it considered our feedback on the cost of the treated water storage programme from the draft business plan, and for an explanation of the reduction in investment. We wanted to understand whether the reduction was due to lower investment demand or a reduction in assumed unit costs in response to our feedback on the draft business plan submission.

1.3.104. Scottish Water's response to our question suggested that the reduction was related to a change in forecast demand levels following its updates to its management approaches. However, it explained that the treated water storage programme should be considered together with the maintenance of chlorine contact tanks. Scottish Water explained that the total investment across both maintenance programmes remains broadly the same between the draft and the final business plan. Table 30 compares Scottish Water's proposed maintenance investment between the draft and final business plan.

*Table 30: Treated water storage and chlorine contact tank maintenance*

| In 2024-25 prices | Draft Business Plan | Final Business Plan | Difference |
|---|---|---|---|
| Treated water storage tank maintenance | £400m | £290m | -£111m |
| Chlorine contact tanks maintenance | £25m | £134m | £109m |
| **Total** | **£426m** | **£423m** | **-£2m** |

1.3.105. Following our feedback on the draft business plan, we consider that the reduction in the treated water storage programme relates to a change in investment demand and that Scottish Water has not provided a more robust cost justification. As such, we propose applying a cost challenge in this area in our draft determination.

1.3.106. In considering the appropriate cost challenge, we calculate the identified cost challenge as a percentage of Scottish Water's proposed investment in the draft business plan. Table 31 shows that a cost challenge of £50 million to £100 million is equivalent to a cost challenge of around 12.5% to 25%.

*Table 31: Treated water storage cost challenge*

| Treated water storage | Values |
|---|---|
| Treated water storage: draft business plan submission (2023-24 prices) | £391m |
| Treated water storage: draft business plan submission (2024-25 prices) | £400m |
| Cost challenge based on the lower end of the range | £50m |
| Cost challenge based on the higher end of the range | £100m |
| Proposed cost challenge: low range (%) | 12.5% |
| Proposed cost challenge: high range (%) | 25.0% |

1.3.107. In setting the appropriate cost challenge, we need to balance the scope for efficiency with other factors, such as the consequences of setting an efficiency challenge that is too high, which may result in under-delivery. We consider this risk is higher for Scottish Water than for companies in England and Wales, recognising that the latter can manage shortfalls in funding through access to external capital. In this regard, we consider that a catch-up efficiency target of 10% on the lower end of the range, reflecting the scope for Scottish Water to catch up on the benchmark's lower unit costs, is achievable and appropriate.

1.3.108. Table 32 sets out our proposed cost challenge and our draft determination allowance.

*Table 32: Draft Determination allowance for treated water storage*

| Treated water storage | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £290m |
| Cost challenge (2024-25 prices) | -£29m |
| Draft allowance (2024-25 prices) | £261m |
| Draft outputs to be delivered over 2027-33: Number of treated water storage asset interventions | 17 |

1.3.109. Furthermore, as per paragraph 1.2.60, WSP further reviewed 1 project and 4 water programmes from the final business plan submission which are covered in the following paragraphs:

- Project for smart meter roll-out to non-domestic premises – £60 million in SRC27 (2024-25 prices);
- Programme to 'Resolve matters in the interest of safety' – £278 million in SRC27 (2024-25 prices);
- Programme to 'Maintain WTW Chemical Storage and Dosing' – £140 million in SRC27 (2024-25 prices);
- Programme for 'Chlorine Contact Tank Management' – £134 million in SRC27 (2024-25 prices); and
- Programme to 'Maintain SCADA, HMI, PLC' – £97 million in SRC27 (2024-25 prices).

1.3.110. The review of the smart meter roll-out project (£60 million in SRC27) found that the investment need for the transition from mechanical to smart metering is clearly articulated, strategically justified, and broadly compliant with policy and regulatory expectations. Scottish Water has demonstrated a strong strategic rationale, linking the investment to long-term supply demand pressures, notably the forecast 240 Ml/d deficit by 2050, as well as shorter-term SRC27 leakage reduction requirements (10-13%) and regionally acute water stress. Smart metering is appropriately positioned as a key enabler of demand management, leakage reduction, customer engagement, and network resilience, with an anticipated contribution of around 80 Ml/d of sustainable demand reduction. Scottish Water has undertaken a proportionate and structured options appraisal and that it

appropriately evaluates the chosen solution, noting that few viable alternatives exist and that this approach is widely used and proven in England and Wales for domestic metering, offering clear advantages over traditional mechanical meters.

1.3.111. The projected customer-demand-reduction benefits are well profiled, achievable, and appropriately stated. However, we consider the trajectory for achieving the benefits from network leakage reduction (half of all forecast benefits) to be challenging and ambitious. As such, we will monitor progress closely to understand benefits realisation.

1.3.112. As part of the review, Scottish Water provided a more disaggregated breakdown of the associated programme costs by meter size. This information showed that 95% of smart meter installations involve small meter sizes, which are more expensive, as are medium-sized meters. Based on the granular cost data, the blended unit rate averages out at £445 per meter. These costs include the cost for the physical meter, installation, traffic management, and an uplift for installations in the north and island regions of Scotland. The total programme also includes costs for surveys and for the smart metering component (i.e. the smart technology). This compares with median costs in England and Wales for upgrading a meter of £95 (2024-25 prices) and for new meter installs of £448 (2024-25 prices) (see paragraph 1.3.95). As set out in paragraph 1.3.96, Scottish Water explains that the material difference is due to a lack of economies of scale compared to the benchmarking companies and the low volume and high geographic dispersion of non-household meter upgrades. WSP considers high start-up costs to be a valid component of the overall cost profile. However, while it acknowledges that these factors may explain part of the cost difference, WSP still recommended that a cost challenge of 10% to 15% would be reasonable. We agree with this assessment.

1.3.113. Taking account of our own benchmarking analysis and WSP's findings and recommendations, our view is that Scottish Water has not sufficiently evidenced its higher costs. As such, we apply a 15% cost challenge on this programme in the Draft Determination. If Scottish Water can evidence in response to the Draft Determination consultation why its costs of deploying smart meters are materially higher than those of the companies in England and Wales, then we will review this cost challenge.

1.3.114. Table 33 sets out our proposed cost challenge and our draft determination allowance.

*Table 33: Draft Determination allowance for metering*

| Smart meter upgrades | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £60m |
| Cost challenge (2024-25 prices) | -£9m |
| Draft allowance (2024-25 prices) | £51m |
| Draft outputs to be delivered over 2027-33: Number of meter upgrades for non households | 130,000 |

1.3.115. The review of programme to 'Resolve matters in the interest of safety' (£278 million in SRC27) found that the investment need is clearly and robustly demonstrated, driven by statutory obligations under the Reservoirs (Scotland) Act 2011, with failure consequences firmly aligned to Scottish Water's highest risk appetite due to potential impacts on public safety, the environment and continuity of supply. The proposed scope of solution is appropriate and proportionate, encompassing statutory and proactive inspections, rolling maintenance, and Measures in the Interest of Safety (MIOS), with the chosen policy position of proactive compliance and maintenance reasonably selected on the basis of whole-life cost, risk reduction, and resilience benefits. There is a clear line of sight between regulatory drivers, asset criticality, option selection and intended outcomes, providing confidence that Scottish Water is managing reservoir safety risks in a structured, proactive and policy-compliant manner.

1.3.116. The costing approach appears reasonable, based on historical data and latest best estimates (LBEs). However, the £1.1 million unit cost for standard MIOS resolution is high compared to industry standards.[41] This unit cost is based on historical rates for 157 MIOS interventions. Based on WSP's review, we consider that the historic rates of 20 of those interventions should be categorised as what Scottish Water refers to "big ticket" MIOS because they are over £2 million and average £6.3 million in total costs. Including these 20 interventions in the calculation of the standard MIOS unit rate would overestimate the unit rate – if they were excluded, the average value of a MIOS intervention would be £382,947, which more closely aligns with WSP's expectations. Our engineering consultants advised on a cost challenge of between 8% and 12%, noting that it is difficult to determine whether the overall programme investment cost is sensitive to discrepancies in unit costs, as programme costs could vary significantly depending on site-specific constraints, reservoir size, type, and required works. Confidence in the costs would also be strengthened through greater disaggregation of MIOS costs and clearer treatment of discontinuance options. Based on this advice, we consider a 5% cost challenge is appropriate in this area.

1.3.117. Table 34 sets out our proposed cost challenge and our draft determination allowance.

*Table 34: Draft Determination allowance for resolving matters in the interest of safety*

| Resolve matters in the interest of safety (reservoirs) | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £278m |
| Cost challenge (2024-25 prices) | -£14m |

[41] Measures in the Interest of Safety (MIOS) are identified through independent engineer inspections as mandated by the Reservoirs (Scotland) Act 2011. Scottish Water distinguishes two types of MIOS interventions: standard and "big ticket", where the former includes "fixing an asset to ensure it can continue to operate and achieve its expected operational asset life" while the latter includes "renovation / overhaul of older or damaged equipment or replacement of parts of the asset to bring the asset back to a workable condition to extend the expected life of the asset". Scottish Water (2025) 'Summary Management Approach: Water Reservoir Safety MA004', 15 April 2025, pp.28-29, submitted with the final business plan on 26 February 2026.

| | |
|---|---|
| Draft allowance (2024-25 prices) | £286m |
| Draft outputs to be delivered over 2027-33: Number of reservoir interests of Safety interventions | 114 |

1.3.118. The review of the programme to 'Maintain WTW Chemical Storage and Dosing' (£140 million in SRC27) found that the investment need is robustly justified, policy compliant, and strategically aligned with Scottish Water's statutory duties and Ministerial Objectives. The chosen policy position and associated solution scopes are appropriate and proportionate. Scottish Water's approach to inspections, condition assessment, and policy appraisal demonstrates a sound asset management framework, and the solution development is being managed appropriately as projects progress through the gated process. The unit rates applied for the three activity areas are broadly reasonable for this programme, even as the programme remains at an early stage of development through the LBEs. This is based on a sample of 14 similar projects, for which costs were generally aligned with prevailing industry values. However, there is a lack of clarity about how Scottish Water derived the LBEs and the assumptions it used. There is a limited cost challenge, no formal benchmarking against industry comparators, and insufficient evidence of project- or programme-level cost-benefit analysis within Scottish Water's management approach policy. While WSP's subject matter expert review suggests unit rates are broadly reasonable, the absence of systematic benchmarking and quantified efficiency measures reduces confidence in overall cost efficiency. WSP is confident the established delivery approach for this programme will be effective and recommends that Scottish Water challenges unit rates through the implementation of the enterprise delivery model. Based on this, WSP recommended a cost challenge between 2% and 4%. However, given the suggested cost challenge of 2% to 4%, we are satisfied that the costs are broadly reasonable and therefore do not propose to apply a cost challenge in this area. We may revisit this for our Final Determination.

1.3.119. The review of the programme for 'Chlorine Contact Tank Management' (£134 million in SRC27) found that the investment need is clearly demonstrated and is driven by asset age, deteriorating condition, and the critical role chlorine contact tanks play in achieving permit standards for effluent quality. Scottish Water has considered all of the appropriate options for this programme, and the proposed scope of solution is appropriate and proportionate to the identified risks. A large proportion of CCTs have severe operational limitations (some cannot be taken out of service at all, while others can only be taken out of service partially). No clear plan has been identified to manage these constraints, which could lead to unplanned maintenance and unaccounted costs during delivery. Programme outcomes are defined solely in terms of activity counts (e.g. the number of refurbishments), without quantified targets or post-efficiency values, limiting confidence in value-for-money and deliverability assurances. The unit costs for refurbishment and replacement interventions are based on those for treated water storage, which are typically larger than those for chlorine contact tanks. WSP considers that the upper end of unit costs for chlorine contact

tanks is in line with industry standards for large, high-volume assets, which would be atypical for Scottish Water. WSP advised that a cost challenge of 7% to 10% is applied due to Scottish Water's reliance on a condition-based methodology, the pace of delivery mandated by DWQR regulations, and the aforementioned size assumption in costing. As such, we apply a cost challenge of 10%, representing the scope for catch-up efficiency for this investment area.

1.3.120. Since Scottish Water has not provided the number of interventions or outputs to be delivered by this programme, we require Scottish Water to confirm the forecast number of interventions in this area in its response to our Draft Determination.

1.3.121. Table 35 sets out our proposed cost challenge and our draft determination allowance.

*Table 35: Draft Determination allowance for chlorine contact tank management*

| Chlorine contact tank management | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £134m |
| Cost challenge (2024-25 prices) | -£13m |
| Draft allowance (2024-25 prices) | £120m |
| Draft outputs to be delivered over 2027-33: Capacity at WTW sites made compliant with standards (Ml/d) | 0 |

1.3.122. The review of the programme to 'Maintain SCADA, HMI, PLC' (£97 million in SRC27) found that the investment need is clearly demonstrated and justified, reflecting the critical role of SCADA, HMI and PLC assets in maintaining safe, compliant and resilient system operation, with failures posing unacceptable risks to public health, environmental performance and security of supply. Scottish Water has a strong and comprehensive understanding of the operational technology asset base, supported by complete obsolescence data and well-defined lifecycle assumptions, which provides a robust foundation for forecasting investment need over the SR27 period. The selected policy of planned replacement at obsolescence Grade 3 is appropriate and proportionate, striking a reasonable balance between cost, risk and deliverability given short asset lifecycles and the lead times required for project development and delivery. Unit costs and overall cost forecasts are considered reasonable and well supported by recent delivery experience and transparent assumptions, with limited site-specific variability enabling a relatively high degree of confidence in the proposed investment profile. They are aligned with similar programmes completed by other water companies. Based on this assessment, WICS does not propose a cost challenge in this area.

### Conclusion of review of investment related to drinking water quality

1.3.123. Table 36 below summarises WICS' draft allowance for each investment programme within the water quality and water continuity areas following our review as explained in this

section. As explained in Chapter 5 of the Draft Determination, we also apply a further efficiency productivity challenge to this allowance and allow some additional investment, which we have not allocated to a specific investment programme or project. These adjustments are not captured in the table below.

1.3.124. Table 37 and Table 38 below outline the relevant enhancement and asset maintenance outputs respectively for the water quality and water continuity areas which we expect to be delivered for the allowed investment (i.e. the tables do not reflect the additional outputs we expect Scottish Water to deliver with the additional investment allocations we make in Chapter 5 of the main Draft Determination document). Where there are no listed asset maintenance outputs, we require Scottish Water to confirm the forecast number of interventions or outputs in its response to our Draft Determination.

*Table 36: Draft Determination allowance for drinking water quality and continuity investment*[42]

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA001 - Water Quality | Water Treatment | 1,294 | 1,267 | Cost challenge on the project for Daer WTW (-£13.4 million) and on the programme for maintaining chlorine contact tanks (-£13 million). |
| TA001 - Water Quality | Water Storage | 318 | 289 | Cost challenge on the programme for maintaining treated water storage (-£29 million). |
| TA001 - Water Quality | Water Distribution | 64 | 64 | |
| TA001 - Water Quality | Lead Management | 36 | 34 | Cost challenge on the programme to replace lead communications pipes (-£3 million). |
| TA001 - Water Quality | Raw Water and Catchment Management | 9 | 9 | |
| TA002 - Water Continuity | Abstraction, Sources and Raw Water Transfers | 427 | 413 | Cost challenge on the programme for resolving matters in the interest of safety (maintaining dams and ancillary items; -£14 million). |
| TA002 - Water Continuity | Water Treatment | 7 | 7 | |
| TA002 - Water Continuity | Water Transmission (trunk mains and strategic pipelines) | 99 | 99 | |

[42] WICS' draft allowance in this table is before applying an additional productivity efficiency challenge and before allowing additional unallocated investment. Please refer to Chapter 5 of the Draft Determination for more details on these further adjustments.

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA002 - Water Continuity | Water Pumping Stations | 48 | 43 | Cost challenge on the programme for maintaining the pumping equipment (-£5 million). |
| TA002 - Water Continuity | Water Distribution | 686 | 682 | Cost challenge on the programme for maintaining distribution infrastructure meters and monitoring equipment (i.e. leakage management equipment; -£4 million). |
| TA002 - Water Continuity | Resilience and Growth | 126 | 126 | |
| TA002 - Water Continuity | Other Programmes | 377 | 368 | Cost challenge on the metering programme (-£9 million). |
| | **Total** | **3,491** | **3,400** | |

*Table 37: Enhancement outputs to be delivered with Draft Determination allowance for water*

| Table 2 ref. | Output category | Unit | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 | Total |
|---|---|---|---|---|---|---|---|---|---|
| **T2.5** | Number of lead communication pipes replaced | Number | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | 3,000 | **18,000** |
| **T2.7** | Capacity at WTW sites with new auto-shutdown risk control interventions | Ml/d | - | 60 | 12 | - | 97 | - | **168** |
| **T2.8** | Capacity at WTW sites made compliant with standards | Ml/d | 107 | 3 | 182 | 237 | 120 | 156 | **804** |
| **T2.9** | Capacity at WTW sites with improved treatment process | Ml/d | 14 | 72 | 12 | 9 | 4 | 60 | **170** |
| **T2.10** | Number of raw water supplies with improved water quality | Number | - | - | 1 | 10 | 11 | 12 | **34** |
| **T2.20** | Number of properties where persistent low pressure is resolved | Number | - | 3 | 14 | 9 | 7 | 7 | **40** |
| **T2.22** | Number of properties with improved resilience of water supply | Number of properties | - | - | - | - | - | 158,651 | **158,651** |
| **T2.27** | Number of properties with meter installations for first time registered non-domestic premises | Number | 820 | 820 | 820 | 820 | 820 | 820 | **4,920** |
| **T2.41** | Meter upgrades - non-households | Number | 26,500 | 26,500 | 24,000 | 21,500 | 21,500 | 10,000 | **130,000** |
| **T2.42** | Length of potable water mains renewed | km | 107 | 147 | 170 | 179 | 295 | 315 | **1,214** |
| **T2.54** | Reduction in leakage | Ml/d | 3 | 3 | 3 | 3 | 4 | 4 | **20** |
| **T2.58** | Number of treated water storage operability (by-pass) interventions | Number | 10 | 5 | 1 | - | - | - | **16** |
| **T2.58** | Number of properties with lead sampling and risk assessment completed | Number | 894 | 932 | 1,007 | 1,083 | 1,155 | 1,230 | **6,301** |
| **T2.58** | Number of sites with standby power equipment installed | Number | - | - | - | - | 52 | - | **52** |

*Table 38: Replacement, repair and refurbishment outputs to be delivered*

| Primary output | Unit | Total |
|---|---|---|
| Number of sites with reservoir drawdown enhancements | Number | - |
| Demand-side improvements delivering benefits (excluding benefits from metering and leakage reductions) | Ml/d | - |
| Number of WTW Instrumentation interventions | Number | 1 |
| Number of catchments managed to protect and improve water quality | Number | 10 |
| Number of membranes replaced or maintained | Number | 177 |
| Number of WTW sand filters with media replaced | Number | 145 |
| Number of WTW Granular Activated Carbon (GAC) filters with media replaced | Number | 185 |
| Number of treated water storage asset interventions | Number | 17 |
| Number of secondary disinfection asset interventions | Number | 53 |
| Length of trunk main interventions | Metres | 21,752 |
| Number of raw water intake interventions | Number | 10 |
| Number of treated water pump interventions | Number | 139 |
| Number of raw water pump interventions | Number | 20 |
| Length of raw water mains interventions | Metres | 1,531 |
| Length of aqueducts or tunnel interventions | Metres | - |
| Length of mains with pressure management intervention | Metres | 5,454 |
| Number of sites with emergency planning equipment installed | Number | - |
| Number of sites with emergency planning equipment interventions | Number | 20 |
| Number of strategic network valve interventions | Number | 237 |
| Number of sites with black start capability improved | Number | 12 |
| Number of water hydraulic models maintained | Number | 300 |
| Number of sites with metals removal interventions | Number | 1 |
| Length of water mains cleaned | Metres | - |
| Number of reservoir interests of Safety interventions | Number | 118 |
| Number of raw water storage asset interventions | Number | - |
| Number of water pipe bridge interventions | Number | 10 |
| Number of fixed wire electrical system or statutory maintenance asset interventions | Number | - |
| Number of SCADA, HMI, PLC asset interventions | Number | 243 |
| Number of WTW Chemical Storage and Dosing Vessel interventions | Number | 201 |
| Number of properties with reduced risk of flooding from mains | Number of properties | - |
| Number of leakage management equipment interventions | Number | 8,726 |
| Number of WTW sludge handling asset interventions | Number | - |
| Number of existing meter interventions | Number | 4,261 |
| Number of street furniture interventions | Number | - |
| Number ATOM water asset interventions | Number | - |
| Number of borehole interventions | Number | - |
| Number of high voltage system interventions | Number | 14 |

| | | |
|---|---|---|
| Number of water sites with Motor Control Centre interventions | Number | 98 |
| Number of sample point interventions | Number | 394 |
| Number of sites with water security interventions | Number | 920 |
| Number of sites with standby power equipment interventions | Number | 95 |
| Number of water sites with telemetry interventions | Number | 6 |
| Capacity at WTW sites made compliant with standards | Ml/d | - |
| Number of water property operational buildings interventions | Number | 33 |
| Number of WTW chemical storage and dosing interventions | Number | 18 |
| Number of Phosphate Equipment asset interventions | Number | 208 |
| Number of Filtration and disinfection asset interventions | Number | 3,852 |
| Number of sub-sea main interventions | Number | - |
| Number of water demand management interventions | Number | - |

## 1.4. Review of investment related to water environment and managing quantity of flows

1.4.1. This section outlines the investment in water environment and managing the quantity of flows which Scottish Water proposes to deliver by programme area, and details how WICS has reviewed these proposals by each of the review approaches below:

- Feedback from the Scottish Environmental Protection Agency;
- Review of investment cases;
- Review of asset maintenance investment;
- Benchmarking review; and
- External engineering review.

### Summary of Scottish Water's proposals in the final business plan

1.4.2. Table 39 outlines the investment Scottish Water proposes to deliver in its final business plan in relation to the water environment and managing the quantity of flows.

*Table 39: Business plan investment for water environment and managing quantity of flows*

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) |
|---|---|---|
| TA003 - Water Environment | Waste Water Treatment | 983 |
| TA003 - Water Environment | Waste Water Bioresource Treatment | 157 |
| TA003 - Water Environment | Water Treatment Works Sludge Storage | 17 |
| TA003 - Water Environment | Waste Water Sewer Networks | 413 |
| TA003 - Water Environment | Waste Water Other – Region Wide | 291 |
| TA003 - Water Environment | Water Abstraction - Water Resources Environmental Monitoring and Compliance | 6 |

| | | |
|---|---|---|
| TA003 - Water Environment | Water Reservoir Compensation Compliance and RBMP Enhancement | 40 |
| TA003 - Water Environment | Other PFI Transfers | 7 |
| TA004 - Managing Quantity of Flows | Asset Repair, Refurbishment and Replacement (AR3) | 603 |
| TA004 - Managing Quantity of Flows | Enhancement | 367 |
| | **Total** | **2,885** |

### Regulator feedback

1.4.3. We received feedback from SEPA in relation to the investment covering water environment and wastewater flows. SEPA identified the following statutory drivers for investment:

- Bathing Water Directive;
- Water Environment (Shellfish Water Protected Areas: Designation) (Scotland) Order 2026 Shellfish Waters;
- Urban Wastewater Treatment Directive – current and recast;
- Water Resources Water Environment and Water Services ( Scotland) Act 2003;
- Climate Change (Scotland) Act 2009 – adaptation duty; and
- Flood Risk Management Act.

1.4.4. SEPA considers that, while the Final Business Plan demonstrates progress in several areas, a number of significant statutory risks remain unresolved. In particular, gaps persist regarding unsatisfactory intermittent discharges (UIDs), bathing waters, water resources, blue-green infrastructure (BGI), climate commitments, legislative preparedness, and the rephasing of SR21 programmes.

1.4.5. SEPA considers Scottish Water's approach in the final business plan is to include allocations mostly for studies and preliminary work (such as installing Pass Forward Flow monitors) rather than for implementing solutions to address any identified non-compliance with respect to investment planning for bathing waters, water resources and urban wastewater. SEPA also requests provisions for studies for shellfish water protected areas and committing investment to deliver identified improvements in SRC27. SEPA considers deferring improvements to the SRC33 period is unacceptable as this heightens the risk of breaching statutory duties, compressing delivery timelines and cost escalations. SEPA considers that the current provisions for addressing non-compliance in SRC27 is insufficient and would prefer for Scottish Water to commit larger investment allocations across its wastewater duties to provide assurance that compliance with both current and incoming legislation (e.g. PFAS, UWWTD Recast, Climate Policy) will be achieved within SRC27.

1.4.6. SEPA has specific concerns with respect to the Unsatisfactory Intermittent Discharges (UIDs) programme where it asked Scottish Water to deliver within SRC27 25% of the total remaining

UIDs after the planned RBMP3[43] UIDs are addressed. Scottish Water is proposing to deliver 150 UIDs in SRC27, which is less than 25% of the total and also includes 43 RBMP3 UIDs (to be delivered by December 2027).

1.4.7. SEPA highlighted that rephasing of SRC21 commitments to SRC27 continues despite its strong objections. SEPA has indicated it may use regulatory powers to ensure commitments originally due in the SRC21 period are delivered. It also requested that our Draft Determination explicitly require Scottish Water to progress improvements identified during the SRC27 period through the change control process, so they are delivered within the period rather than delayed until SRC33.

1.4.8. SEPA has also highlighted that there is further scope for Scottish Water to adopt more blue-green infrastructure solutions, enhance flood resilience given FEH22 rainfall modelling,[44] and more proactively identify properties at future risk. It considers that reductions in expenditure compared to the draft business plan on water continuity, climate change and growth have not been supported by analysis demonstrating that statutory compliance will still be achieved.

### Review of investment cases

1.4.9. We completed an engineering review of 22 projects, valued at greater than £6 million, covered by the water environment and wastewater flow technical appendices. These 22 projects have a combined value of £332 million. The results of our review, assessed against the criteria set out in paragraphs 1.2.21 to 1.2.27, are shown in Table 40.

1.4.10. Of the 22 projects, 17 were assessed with a Green RAG score, meaning these investments are allowed. 4 were assessed with an Amber RAG score, meaning WICS have reservations regarding one or more assessment criteria, and 1 has a Red RAG score, meaning investment may not be allowed.

[43] River Basin Management Plan 3 which covers the period from 1 January 2022 to 31 December 2027.
[44] The FEH22 rainfall model is the Flood Estimation Handbook's latest UK-wide statistical model for rainfall depth-duration-frequency estimation.

*Table 40: Assessment summary of wastewater-related project investment cases*

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Primary Technical Appendix | RAG Score: Needs & Options | RAG Score: Regulatory Engagement | RAG Score: Cost Estimate | RAG Score: Benefits & Risk | RAG Score: Overall Assessment |
|---|---|---|---|---|---|---|---|---|
| 5363110201 | W571 - Dolphin Road Glasgow | 15 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110202 | NE60 Cavendish Avenue area Perth | 10 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363111113 | Kinning Park WwPS - Asset Replacement | 49 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363111130 | ALLANFEARN STC NH711475 - REPLACEMENT OF DIGESTER 1 AND 2 | 19 | Water Environment | GREEN | GREEN | AMBER | AMBER | AMBER |
| 5363112312 | Allanfearn WwTW - Treatment and bioresource | 55 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112893 | Dunbar WwTW - Growth | 36 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112894 | Dalderse WwTW - Growth | 16 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113603 | Fauldhouse WwTW River Almond Ww WFD Improvements | 11 | Water Environment | GREEN | GREEN | GREEN | AMBER | GREEN |
| 5363117633 | Turriff WwTW - Capital Maintenance | 14 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110205 | 719-1 Queen Street Dumfries | 8 | Wastewater Flows | GREEN | GREEN | AMBER | RED | AMBER |
| 5363110206 | IFOS Empire Way and Dominion Road Gretna - 347 2 | 9 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110207 | EFOS - Barron Terrace and Waggon Road Leven | 7 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | AMBER |
| 5363111111 | Troqueer WWPS - Site Replacement | 7 | Water Environment | GREEN | GREEN | GREEN | AMBER | AMBER |

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Primary Technical Appendix | RAG Score: Needs & Options | RAG Score: Regulatory Engagement | RAG Score: Cost Estimate | RAG Score: Benefits & Risk | RAG Score: Overall Assessment |
|---|---|---|---|---|---|---|---|---|
| 5363111134 | Shieldhall WWTW - Control System Replacement | 10 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363111141 | Shieldhall WwTW - HV Refurbishment | 8 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363111742 | North Lodge Rd WWPS1 Pumping Main Replacement Phase 3 | 12 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113549 | SW1670 - Borrowmeadow Road Stirling | 8 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113565 | IFOS - Peatville Terrace Edinburgh - E1537 | 6 | Wastewater Flows | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363113601 | Persley WwTW River Don WW WFD Improvement | 7 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363117638 | Pathhead WwTW - Capital Maintenance | 6 | Water Environment | RED | GREEN | AMBER | AMBER | RED |
| 5363112317 | Turret - Legacy Sludge | 11 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112903 | Balmaha WwTW - Growth | 7 | Water Environment | GREEN | GREEN | GREEN | GREEN | GREEN |
| | **Total** | **332** | | | | | | |

*Projects assessed with a Red RAG score*

1.4.11. **Pathhead WwTW – Capital Maintenance:** The project investment appraisal provided by Scottish Water lacked sufficient evidence to assess this project. To address this, WICS raised a formal query with Scottish Water, and further information on the project's needs and options was provided.[45] However, we still have concerns that this project lacks sufficient evidence to support the investment. In particular:

- Although Scottish Water confirmed that the primary need at this project is asset maintenance, not growth as presented in the original evidence, we do not see evidence that the works is in poor condition (due to aged assets) or that there are recorded non-compliance events;
- There is only limited information provided regarding the incapability of the existing assets and what effect these incapabilities have on the effectiveness of the treatment process. There is no evidence of non-compliance;
- There is no assessment of the needs relative to risk reduction that will be achieved by any of the short-listed options;
- There is only limited evidence given for the selection of the recommended option from the short-listed options; and
- There is no comparison of risk reduction or cost against a base case option.

1.4.12. Therefore, WICS considers that the Needs and Options assessment criteria are not met in this case and that insufficient information has been provided for WICS to assess the cost estimate for Pathhead WwTW.

*Projects assessed with an Amber RAG score*

1.4.13. **ALLANFEARN STC NH711475 - REPLACEMENT OF DIGESTER 1 AND 2:** WICS queried the lack of evidence to substantiate the £24 million cost estimation for this project (total expenditure over SRC21 and SRC27). Scottish Water responded that this project would now be closed and restarted at Gate 30 and included in a wider Allanfearn wastewater treatment works project, we assume this is the £56 million Allanfearn WwTW - Treatment and bioresource, project reference 5363112312.[46]

1.4.14. Therefore, our understanding is that the budget of £19.5 million for this project in SRC27 is no longer needed and can be removed from the final business plan as the replacement of the digesters is included in the Allanfearn WwTW - Treatment and bioresource, project reference 5363112312.

[45] WICS query reference 08-13 issued 17/04/2026 and reply from Scottish Water dated 01/05/2026
[46] WICS query reference 07-12 issued 10/04/2026 and reply from Scottish Water dated 28/04/2026

1.4.15. **Troqueer WWPS - Site Replacement**: WICS requested further information on the cost estimate for this project, as the final business plan budget of £7 million appears low compared to similar projects, raising the risk that the full benefits of the investment may not be realised. In response to our query, Scottish Water explained that the cost estimation had been assured in accordance with its procedures.[47] Despite this, the assessment score for Troqueer wastewater pumping station remains Amber due to a lack of evidence that the project benefits and the risks in project delivery had been adequately considered in the project investment appraisal.

1.4.16. **719-1 Queen Street Dumfries**: The proposed solution for this internal flooding prevention project involves extensive civil engineering works in an established residential area. This includes a storage tank to be constructed in an existing car park, with a proposed volume of 3,050 m3 and a diameter of circa 12m at 22m deep. Together with sewers to be constructed in relatively narrow streets, with the sewers ranging in diameter from 400mm to 1200mm. The evidence provided demonstrates that the solution is appropriate, but there is a clear risk of cost escalation due to the inherent nature of the proposed civil engineering works. Identified risks include:

- sewers on private land/car parks that will require landowner permission;
- full road closures and extensive traffic management;
- unknown ground conditions – risk of excavation in rock and historic building remains in the construction footprint;
- construction of the deep storage tank could risk disturbance/vibration of adjacent buildings;
- it is possible not all sewer laterals have been located resulting in addition works being required; and
- utility cables and pipes may obstruct the proposed route of new sewers requiring rerouting and design changes.

1.4.17. WICS consider the high construction risks associated with this project may result in cost escalation and/or the benefits identified for this project not being fully delivered.

*Observations regarding other projects assessed as Amber*

1.4.18. **EFOS - Barron Terrace and Waggon Road Leven**: This external flooding reduction project is not due to start until 2031. The works entail inherent construction delivery risk, as the solution involves installing large-diameter sewer pipes in relatively narrow streets in Leven. There are noted risks related to existing utility locations, ground conditions and work under an existing road bridge. The overall Amber score reflects our concern that, with the proposed

[47] WICS query reference 08-12 issued 17/04/2026 and reply from Scottish Water dated 07/05/2026

start date late in the SRC27 period, there is a distinct risk of project time and cost overrun into the next investment period.

*Conclusions reflected in the main draft determination document*

1.4.19. Based on our assessment of the evidence provided, the investment of around £6 million proposed in the final business plan for Pathhead WwTW will not be allowed.

1.4.20. Based on our understanding, the Allanfearn STC digester replacement project can be removed from the final business plan budget along with the associated investment of £19.5 million in the 2027-33 period, to avoid double-counting of this amount in the wider Allanfearn wastewater treatment works project.

### Review of asset maintenance investment

1.4.21. Table 41 below lists the reviewed Management Approaches, which cover investments mostly related to wastewater services, along with WICS' RAG assessment. The 6 Management Approaches highlighted in orange (namely, MA004, MA017, MA024, MA043, MA057, and MA113) were excluded from our internal review as they cover programmes of work which were included in the external engineering review by WSP. The following paragraphs detail the assessment of each of the remaining 8 management approaches.

*Table 41: Management Approaches relating mostly to Wastewater service*

| MA number | MA Name | Value in SRC27 (2024-25 prices; £m; post-efficiency) | Primary Service | Proportion of value in SRC27 for water | Proportion of value in SRC27 for wastewater | Proportion of value in SRC27 for shared assets | WICS assessment |
|---|---|---|---|---|---|---|---|
| MA003 | Maintain Pipebridges | 49 | Wastewater | 0% | 100% | 0% | Amber |
| MA004 | Reservoir Safety | 300 | Wastewater | 100% | 0% | 0% | |
| MA012 | Wastewater Pumping Mains | 138 | Wastewater | 0% | 100% | 0% | Green |
| MA013 | Wastewater Control Systems | 41 | Wastewater | 0% | 100% | 0% | Green |
| MA017 | Wastewater Treatment Works - Inlet Works | 124 | Wastewater | 0% | 100% | 0% | |
| MA018 | Ironworks | 73 | Wastewater | 0% | 100% | 0% | Amber |
| MA023 | Wastewater Pumping Stations | 144 | Wastewater | 0% | 100% | 0% | Amber |
| MA024 | Wastewater Bioresource Treatment and De-watering Centres | 447 | Wastewater | 0% | 100% | 0% | |
| MA042 | Wastewater Treatment Works - Primary Treatment | 77 | Wastewater | 0% | 100% | 0% | Amber |
| MA043 | Wastewater Treatment Works Secondary Tertiary Treatment | 203 | Wastewater | 0% | 100% | 0% | |
| MA057 | Wastewater Treatment Works Ancillaries | 160 | Wastewater | 0% | 100% | 0% | |
| MA068 | Statutory, Essential and Planned Maintenance | 96 | Wastewater | 37% | 63% | 0% | Amber |
| MA076 | Wastewater Studies | 54 | Wastewater | 0% | 100% | 0% | Green |
| MA113 | Gravity Sewers | 302 | Wastewater | 0% | 100% | 0% | |
| | **Total** | **2,208** | | | | | |

*MA003 Maintain Pipebridges*

1.4.22. Management Approach 3 covers the following wastewater pipe bridges and overland sewer assets:

- Critical wastewater pipe bridges and overland sewer assets, which will undergo either planned intervention at condition grade 3 or on specialist engineer recommendation, or responsive intervention upon failure; and
- Non-critical wastewater pipe bridges and overland sewer assets, which will undergo either planned intervention at condition grade 4 or on specialist engineer recommendation, or responsive intervention upon failure.

1.4.23. Scottish Water defines critical assets as assets with one of the following characteristics:

- Crosses a railway or road;
- Crosses a footpath;
- Crosses a watercourse upstream of and near a designated Bathing Water; and
- Crosses a watercourse and is assessed as having potential for a Category 1 / 2 Environmental Pollution Incident (EPI).

1.4.24. Scottish Water is proposing to spend £49 million in this area over the 2027-2033 regulatory period.

1.4.25. MA003 clearly sets out the estimated unit costs of interventions and run rates. However, we note that the unit costs of interventions outlined in the final business plan are significantly lower than those outlined in the management approach. Additionally, the number of interventions is significantly higher in the final business plan than in the management approach. This is shown in Table 42.

*Table 42: Pipebridge interventions management approach versus final business plan*

| Criteria | Document | Values |
|---|---|---|
| Number of interventions in SRC27 | Final business plan | 296 |
| | MA003 | 180 |
| Unit cost | Final business plan | £166,000 |
| | MA003 | £750,000 |
| SRC27 total cost | Final business plan | £49m |
| | MA003 | £144m |

1.4.26. Through our query process, Scottish Water has identified that the number of interventions in the business plan is incorrect. We require Scottish Water to correct this and confirm the number of interventions in its response to the Draft Determination to be included in the Final Determination.

1.4.27. Table 43 provides our draft allowance.

*Table 43: Draft Determination allowance for MA003 Maintain Pipebridges*

| MA003 Maintain Pipebridges | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £49m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £49m |
| Draft outputs to be delivered over 2027-33: Number of sites with wastewater pipebridge interventions | TBC |

### *MA012 Wastewater Pumping Mains*

1.4.28. Management Approach 12 covers wastewater pumping mains (also known as rising mains; 1,441km owned by Scottish Water and 117km of Private Finance Initiative assets) and their component air valves (1,165 Scottish Water-owned and 223 PFI in-use air valves on the asset register, though many more are unrecorded).

1.4.29. The chosen policy option is to have a proactive intervention programme for critical pumping mains to replace or refurbish 1/50th of the total asset base each year (c.15km), with the intention to intervene on all assets that will be more than 50 years old by 2050. Non-critical pumping main assets will be replaced or refurbished after 3 bursts in 2 years. All pumping main assets will be repaired whenever a burst occurs. Air valves on all assets will be inspected every 10 years and serviced or replaced as per the inspection recommendation.

1.4.30. Scottish Water proposes to spend £138 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.4.31. MA012 clearly sets out the estimated unit costs of interventions and run rates. Whilst we note that the number of interventions set out in the final business plan is below that in the management approach, our assessment is that the costs are broadly consistent with the expected unit costs. We therefore consider the costs to be reasonable in this area.

1.4.32. Table 44 provides our draft allowance.

*Table 44: Draft Determination allowance for MA012 Wastewater Pumping Mains*

| MA012 Wastewater Pumping Mains | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £138m |
| Cost challenge (2024-25 prices) | 0 |
| Draft allowance (2024-25 prices) | £138m |
| Draft outputs to be delivered over 2027-33: Length of wastewater pumping main interventions (km) | 77 |

| | |
|---|---|
| Draft outputs to be delivered over 2027-33: Number of air valve interventions at wastewater pumping mains | 171 |

### *MA013 Wastewater Control Systems*

1.4.33. Management Approach 13 covers control system equipment at wastewater sites. Critical assets will be replaced at condition grade 4, and non-critical assets will be replaced on failure.

1.4.34. Scottish Water proposes to spend £41 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.4.35. The number of interventions and unit costs provided within the management approach are explained by policy choices and are based on historical values from similar projects. We are satisfied that these are reasonable and proportionate. We note that the proposed costs represent an increase of more than double Scottish Water's expenditure in this area in the 2021-27 regulatory period; however, Scottish Water explains that this is a step towards the sustainable level from current expenditure. We therefore consider the costs to be reasonable in this area.

1.4.36. Table 45 provides our draft allowance.

*Table 45: Draft Determination allowance for MA013 Wastewater Control Systems*

| MA013 Wastewater Control Systems | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £41m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £41m |
| Draft outputs to be delivered over 2027-33: Number of wastewater SCADA interventions | 96 |

### *MA018 Ironworks*

1.4.37. Management Approach 18 covers ironworks assets across Scottish Water's water and wastewater networks. These assets will be reactively replaced on failure, with limited proactive replacement, for example, when local authorities resurface roads.

1.4.38. Scottish Water proposes to spend £73 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.4.39. Scottish Water's management approach explains that unit costs and run rates are based on historic data. The assumed unit costs have not been benchmarked against those of other utilities or highway authorities. Moreover, the management approach acknowledges that there is uncertainty around the historic replacement rates underpinning the chosen option:

- The total number of ironworks assets is uncertain (estimated 3–4 million);
- Asset age, condition, and deterioration profiles are unknown;
- There is no reliable estimate of the total operating life;
- There is no deterioration model for this asset group; and
- All ironworks are categorised as non-critical given their function within the network and due to lack of evidence that failures would reach a "do not" risk appetite.

1.4.40. The management approach acknowledges that whilst the manufacturer advises ironworks should last at least 30 years, the current replacement rate suggests a considerably longer asset life. The proposed replacement rate implies an asset life of 300-400 years, reflecting uncertainty about the number of ironworks assets. As Scottish Water acknowledges, without a consolidated replacement rate for ironworks across all capital investment areas, it is difficult to assess whether the number of interventions is reasonable.

1.4.41. The chosen intervention run rates are a continuation of current practice and interim assumption, but cannot be regarded as evidence that these assets are being managed effectively, especially given the data uncertainties.

1.4.42. Through the query process, Scottish Water noted that Table X reports no outputs for this management approach as the interventions proposed under this management approach, such as replacing a manhole cover, are classed as responsive repair. Scottish Water noted that this is consistent with how outputs have been reported in the business plan data tables and in the annual return.

1.4.43. We are proposing no further cost challenge in this area. However, we emphasise the need for improvements in the underpinning data, for example, to determine whether the replacement rate is appropriate and to demonstrate that fix-on-fail is the optimal choice.

1.4.44. Table 46 provides our draft allowance.

*Table 46: Draft Determination allowance for MA018 Ironworks*

| MA018 Ironworks | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £73m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £73m |
| Draft outputs to be delivered over 2027-33: Number of street furniture interventions | 0 |

### *MA023 Wastewater Pumping Stations*

1.4.45. Management Approach 23 covers the following wastewater pumping station assets:

- Critical pumping station MEICA assets, which will undergo proactive intervention informed by electricity consumption monitoring. The proposed intervention varies depending on specific characteristics:

  - Terminal pumping station MEICA or large assets (>= 100 kW) will be refurbished where possible to extend asset life and replaced where refurbishment is unviable;
  - Small assets (< 100 kW) will be replaced; and
  - In addition to the above, for those assets with receiving water that is a Bathing Water or Shellfish Water will be proactively inspected annually (prior to the bathing season) and will undergo proactive intervention when electricity use data and/or inspection results indicate the asset is nearing the end of life;

- Non-critical pumping station MEICA assets, which will be responsively replaced at failure; and
- Critical and non-critical pumping station civil assets, which will be proactively inspected every 20 years, undergo proactive intervention at condition grade 5, with refurbishment preferred where possible to extend asset life.

1.4.46. Scottish Water proposes to spend £144 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.4.47. The management approach sets out the proposed number of interventions for the wastewater pumping station's civil assets per decade. However, it is difficult to assess the number of interventions as the management approach does not appear to indicate the number of wastewater pumping station civil assets.

1.4.48. While there is a lack of clarity in MA023 regarding the proposed number of interventions under the chosen option for each category of MEICA wastewater pumping station asset (critical/non-critical and small/large), Scottish Water has provided some clarification on this through the query process. For example, Scottish Water proposes around 250 pump replacements at wastewater pumping stations per year. Given the median replacement age of 14.5 years for MEICA pumping station assets, this would appear to be lower than the steady-state annual replacement rate for the 5,867 wastewater pump assets.

1.4.49. We note that some key assumptions underpinning the management approach are based on limited data. Several examples are set out below:

- The policy trigger for civil assets is the asset reaching condition grade 5 (CG5). The condition data for civil assets is extrapolated from 2007 surveys. This reliance on outdated data introduces a risk that the number of assets at CG5 is understated and that run rates may need to increase as inspections progress. As such, we agree with Scottish Water's assessment that improving civil asset condition data is a high priority;

- Scottish Water does not have a comprehensive view of the condition across wastewater pumping station MEICA assets. The MEICA asset condition is inferred based on age;
- The approach proposed for non-critical MEICA assets differs from that proposed for civil assets or critical MEICA assets. Yet, the management approach notes that the exercise of defining which assets are critical has not been undertaken, and asset criticality is assumed based on asset location, size and position on the network;
- The policy for some critical MEICA assets assumes that refurbishment provides an additional 10 years of life, but the basis of this assumption is unclear; and
- The policy assumes an inspection cost of £1,000; however, it identifies the need to develop an agreed cost for pumping station inspections (MEICA and civil).

1.4.50. We are proposing no cost challenge in this area. However, we emphasise the need to improve the data underpinning this management approach.

1.4.51. Table 47 provides our draft allowance.

*Table 47: Draft Determination allowance for MA023 Wastewater Pumping Stations*

| MA023 Wastewater Pumping Stations | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £144m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £144m |
| Draft outputs to be delivered over 2027-33: Number of sites with wastewater pumping station interventions | 22 |

### *MA042 Wastewater Treatment Works - Primary Treatment*

1.4.52. Management Approach 42 covers the following wastewater treatment works (WWTW) - primary treatment assets:

- Critical MEICA assets, which will be monitored with planned intervention - repair, refurbishment or replacement - initiated where there is a high risk of imminent failure;
- Non-critical MEICA assets, which will be monitored with responsive intervention initiated upon failure, whether that be repair, refurbishment or replacement; and
- Critical civil assets, which will undergo either planned intervention at condition grade 5 or on specialist engineer recommendation or responsive intervention upon failure.

1.4.53. Scottish Water is proposing to spend £77 million (2024-25 prices) in this area over the 2027-33 regulatory period. This is around 30% higher than the forecast set out in the management

approach.[48] We requested further clarification from Scottish Water on this difference, and Scottish Water explained that the forecast number of interventions (what Scottish Water calls investment demand) in this area in the final business had already exceeded the forecast level when preparing the management approach.

1.4.54. However, we note that the final business plan forecasts 45 interventions, which is well below the forecast in the management approach.[49] This is the opposite of what would be expected based on Scottish Water's response.

1.4.55. While this is the case, we do not propose a further cost challenge in this area at this stage. However, we require Scottish Water to explain the difference in the proposed number of interventions between the final business plan and management approach in its response to our Draft Determination. We will then revisit this allowance in our Final Determination.

1.4.56. Table 48 provides our draft allowance.

*Table 48: Draft Determination allowance for MA042 WWTW Primary Treatment*

| MA042 WWTW Primary Treatment | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £77m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £77m |
| Draft outputs to be delivered over 2027-33: Number of WWTW primary treatment asset interventions | 45 |

### *MA068 Statutory, Essential and Planned Maintenance*

1.4.57. Management Approach 68 covers the statutory, essential and planned maintenance activities at water and wastewater sites, offices and other properties. Scottish Water's approach is to meet all statutory requirements.

1.4.58. Scottish Water's approach for each of these areas is:

- Statutory activities will continue as required to meet legal obligations;

[48] The 30% is based on the management approach estimate of £55m (price base not known) from Table 51 of MA042 and £77m in the final business plan (although the latter is in 2024-25 prices and post-efficiency, which suggests that the difference may be higher than 30%). Scottish Water (2025), 'Summary Management Approach Wastewater Treatment Works – Primary Treatment MA042', April 2025, p.60.

[49] The management approach does not set out the forecast number of interventions over the 2027-33 regulatory period; however, Table 48 does provide civil and meica interventions for 2028 and 2029, which suggest around 380 interventions a year. Scottish Water (2025), 'Summary Management Approach Wastewater Treatment Works – Primary Treatment MA042', April 2025, p.56.

- Essential inspections (including Asbestos, Fire Safety and Legionella) will be conducted in line with the relevant risk level, with maintenance conducted as required following inspections;
- Fixed Wire Testing will be conducted every 3 years; and
- Planned maintenance will continue in line with the previous risk-based approach.

1.4.59. Scottish Water is proposing to spend £96 million (2024-25 prices) in this area over the 2027-33 regulatory period.

1.4.60. While we are concerned that Scottish Water has not provided an estimated number of interventions for Statutory activities or Essential inspections, representing c.60% of total spend within this MA, we are satisfied that the costs are reasonable for the areas where the number of interventions and unit costs have been provided. Further, we note that the proposed spend on this MA is approximately 10% lower than in the 2021-27 regulatory period, pre-efficiency.

1.4.61. Recognising the points above, we propose no further cost challenge in this area. However, we require Scottish Water to confirm the forecast number of interventions in this area in its response to our Draft Determination. We will then revisit this allowance in our Final Determination.

1.4.62. Table 49 provides our draft allowance.

*Table 49: Draft Determination allowance for MA068 Statutory, Essential and Planned Maintenance*

| MA068 Statutory, Essential and Planned Maintenance | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £96m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £96m |
| Draft outputs to be delivered over 2027-33: Number of asset interventions covering fixed wire electrical systems, wastewater treatment works statutory maintenance and ATOM water and wastewater assets | 0 |

### *MA076 Wastewater Studies*

1.4.63. Management Approach 76 was not submitted with the final business plan, but was provided through our query process with Scottish Water. The management approach covers studies which understand and confirm whether a problem identified by Scottish Water requires immediate resolution. Studies provide a view of the scale of possible solutions and develop a high-level estimate of the investment required. In its response to our query, Scottish Water provided unit costs for the studies.

1.4.64. WICS recognises that it is important to undertake studies to ensure that any future investment will provide the required benefits. In line with past practice, we propose to allow the expenditure associated with the management approach.

1.4.65. However, we consider it prudent to impose conditions on the allowance. We expect that Scottish Water will conduct regular engagement with SEPA, to allow SEPA to keep updated of progress and the recommended action from the studies. We also expect that Scottish Water meets its 2030 deadline to avoid delaying future investment.

*Table 50: Draft Determination allowance for MA076 Wastewater Studies*

| MA076 Wastewater Studies | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £54m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £54m |
| Draft outputs to be delivered over 2027-33: Number of wastewater treatment improvement studies | 50 |
| Draft outputs to be delivered over 2027-33: Number of climate change audits and studies | 1 |

### Benchmarking

1.4.66. Table 51 sets out the investment areas subject to benchmarking for water environment and wastewater flows and our assessment.

*Table 51: Assessment summary of wastewater-related areas suitable for benchmarking*

| Area | Programme | Sub-area ("Investment Area") | Sub-area investment (2024-25 prices; £m) | WICS Assessment |
|---|---|---|---|---|
| Water Environment | Waste Water Treatment | WWTW Improvements | 58 | No cost challenge proposed |
| Water Environment | Waste Water Bioresource Treatment | Industrial Emissions Directives | 41 | No cost challenge proposed |
| Water Environment | Waste Water Sewer Networks | Unsatisfactory intermittent discharges | 269 | No cost challenge proposed |
| Water Environment | Waste Water Sewer Networks | Network monitoring | 9 | No cost challenge proposed |

| | | | | |
|---|---|---|---|---|
| Managing Quantity of Flows | Enhancement | To reduce flood risk to customers impacted by high consequence external sewer flooding where not disproportionately expensive | 45 | No cost challenge proposed |
| | | **Total** | **679** | |

*Wastewater Treatment Works improvements (Phosphorus removal)*

1.4.67. Wastewater treatment works are subject to phosphorus consent limits in order to avoid negative environmental impacts. To meet regulatory guidelines, Scottish Water must undergo enhancement investment to ensure these requirements are being met.

1.4.68. Scottish Water has applied the phosphorus removal benchmarking models developed by Ofwat in PR24 to benchmark Scottish Water's proposed phosphorus removal enhancement expenditure against the companies in England and Wales.[50] Ofwat developed four models for phosphorus removal schemes, two based on historic data and two on forecast data.[51] Ofwat calculated a final allowance for phosphorus removal by applying an equal weighting to each model. While Scottish Water notes that there are large variances in the results of companies between models, at an overall level Scottish Water is broadly in line with the median benchmark used by Ofwat in its benchmarking.

1.4.69. As an additional check, WICS have applied the model developed by the CMA for benchmarking phosphorus removal costs in the PR24 redeterminations, including Scottish Water's data.[52] The CMA used both historical and forecast phosphorus removal scheme data to benchmark the proposed phosphorus removal costs in England and Wales. However, as we do not have historical scheme costs, we have instead used only forecast data. While this provides an incomplete dataset, we consider that it is appropriate for the analysis.

1.4.70. The CMA models, which use a different modelling technique, confirm the results from Scottish Water's own analysis. This suggests that Scottish Water's proposals are broadly efficient compared to the historical and forecast phosphorus removal schemes in England and Wales. We therefore consider the costs to be reasonable in this area.

[50]Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 – Efficiency', 26 February 2026, p. 114.
[51] Ofwat (2024), 'PR24 final determinations Expenditure allowances – enhancement cost modelling appendix', December 2024, p. 80.
[52] CMA (2026), ' Water PR24 references Final Determinations Volume 2: Enhancement costs – Chapter 5', 10 March 2026, p. 27.

*Table 52: Draft Determination allowance for phosphorous removal*

| Phosphorus removal | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £45m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £45m |
| Draft outputs to be delivered over 2027-33: Population equivalent of WWTW sites made compliant with standards – phosphorus | 376,321 |

### *Wastewater Treatment Works improvements (Sanitary parameters tightening)*

1.4.71. Expenditure on sanitary parameters tightening relates to the costs of meeting more stringent permit requirements at wastewater treatment works for ammonia or biochemical oxygen demand levels.

1.4.72. Scottish Water conducted its own benchmarking using Ofwat's models and showed that its proposals are efficient in this area.[53] The costs shown in Table 53 below include expenditure outside of the SRC27 period, since Ofwat's models focus on the total costs of meeting a requirement, so all relevant expenditure must be included.

*Table 53: Scottish Water's benchmarking analysis of expenditure on sanitary parameters tightening*

| Sanitary parameters tightening proposal | 2024-25 prices |
|---|---|
| Scottish Water's total forecast expenditure over SRC21, SRC27 and SRC33 | £12.0m |
| Modelled allowances after median efficiency challenge using: | |
| - Scheme-level model | £13.5m |
| - Company-level model | £29.4m |
| Triangulated model allowance | £21.4m |
| Implied efficiency score | 0.56 |

1.4.73. WICS agrees with Scottish Water's analysis and therefore considers the costs to be reasonable in this area. Of the £12 million total forecast expenditure, £6.7 million falls within the SRC27 period.

1.4.74. Scottish Water explains in its submission that the three sites where enhancement is required to address sanitary parameters tightening also face an enhancement requirement to meet a tighter phosphorus consent. Its approach to addressing these sites was to develop and cost them as single projects, given the significant interrelatedness between the two enhancement requirements. Consequently the outputs for these projects have not been disaggregated, meaning the outputs for projects relating to sanitary parameters tightening are included in Table 52.

[53] Scottish Water (2026), 'SR27 final business plan: Technical Appendix 12 – Efficiency', 26 February 2026, p.116.

*Table 54: Draft Determination allowance for sanitary parameters tightening*

| Sanitary parameters tightening | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £6.7m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £6.7m |
| Draft outputs to be delivered over 2027-33: Population equivalent of WWTW sites made compliant with standards - phosphorus | 0 |

### *Industrial Emissions Directives*

1.4.75. Industrial Emissions Directives (IED) compliance can be disaggregated into several components, such as secondary containment (bunding) and tank covering. Ofwat set allowances for these two components using econometric models and applied the resulting efficiency to other IED costs.[54] Scottish Water has not provided scheme-level information nor benchmarking evidence in the technical appendices. Due to these data limitations, a simple unit cost per bioresource treatment site has been used for comparison against the modelled costs in England and Wales.

*Table 55: Comparison of IED unit costs per bioresource treatment site*

| Industrial Emissions Directives | Values |
|---|---|
| Scottish Water forecast unit cost (2024-25 prices) | £5.07m |
| England and Wales modelled average unit cost (2024-25 prices) | £10.24m |
| England and Wales modelled median unit cost (2024-25 prices) | £10.30m |

1.4.76. Scottish Water's unit cost is lower than that observed in England and Wales. We therefore consider that Scottish Water's costs in this area are reasonable.

*Table 56: Draft Determination allowance for Industrial Emissions Directives investment*

| Industrial Emissions Directives | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £41m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £41m |
| Draft outputs to be delivered over 2027-33: Number of sludge treatment centres achieving compliance with Industrial Emissions Directive | 8 |

[54] Ofwat (2024), 'PR24 final determinations – Expenditure allowances – enhancement cost modelling appendix', December 2024.

*Unsatisfactory intermittent discharges / Storm overflows*

1.4.77. Ofwat models storm overflow costs in three categories: storage at the network, storage at wastewater treatment works, and flow to full treatment schemes. Ofwat's key cost driver for the first two categories – which are most relevant to Scottish Water's investment – is equivalent storage, a measure of the volume of spill needing to be managed to meet target spill frequencies.[55]

1.4.78. However, Scottish Water was unable to provide equivalent storage data as required for Ofwat's models. Scottish Water explains that this is because Scottish Water's approach to Unsatisfactory Intermittent Discharges (UIDs) differs from the approach to storm overflows taken in England and Wales in that Scottish Water's targets do not relate to spill frequency, but to UID priority and water body quality. As a result, additional storage capacity is not the proposed solution for the majority of Scottish Water's overflows. While Scottish Water has carried out some benchmark modelling for projects where it has been able to estimate equivalent storage, it does not believe the results of these models are insightful, given that the predicted costs are around 10 times higher than Scottish Water's forecast expenditure.[56] We also note Scottish Water's concern that variation in the types of solutions chosen for each UID is likely to reduce the applicability of Ofwat's benchmarking models.[57]

1.4.79. Given these factors, this cost area is subject to review by our external engineering consultants, WSP, whose findings have informed our Draft Determination as explained in the next sub-section.

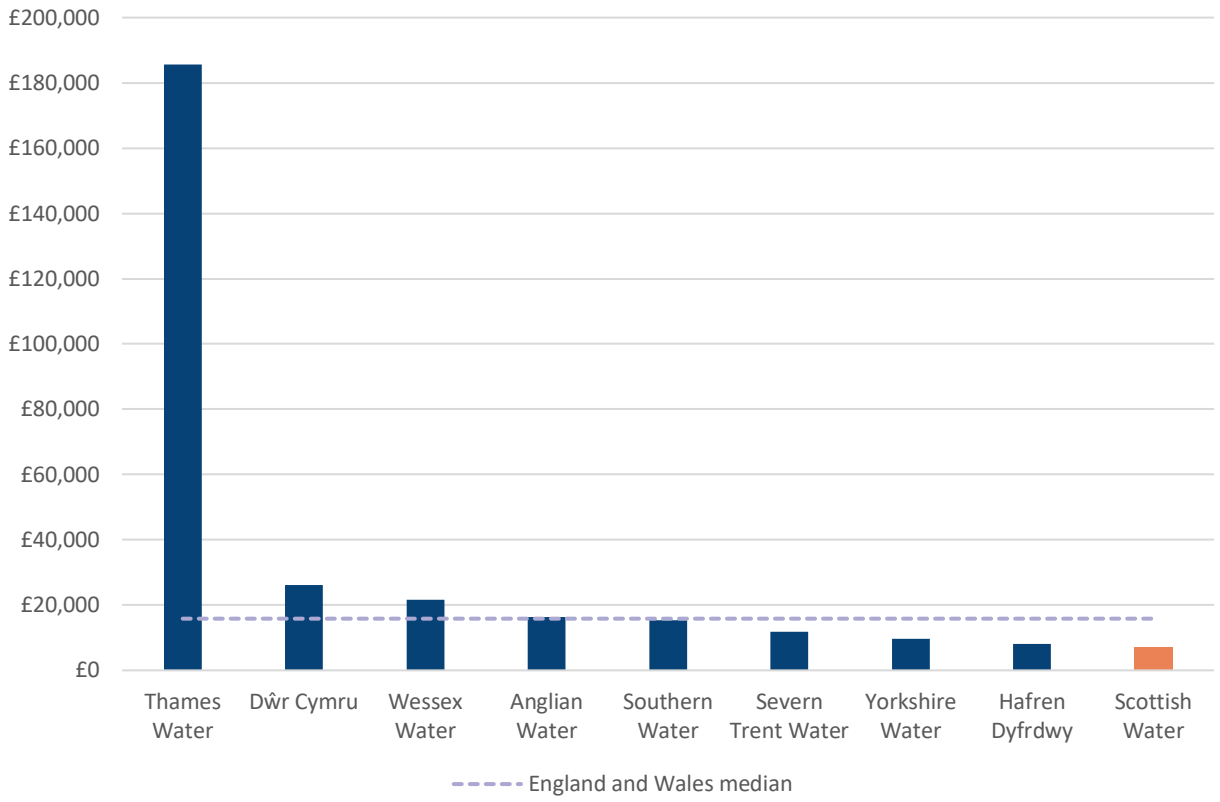
*Network monitoring*

1.4.80. Ofwat models costs for network monitoring by allocating individual schemes to categories based on whether they involve the installation of Event Duration Monitors (EDMs) alone or in combination with other work, such as civils or pass-forward flow monitors. As Scottish Water has not provided scheme-level data on the deployment of Event Duration Monitors (EDMs), we have used a simple unit-cost model to benchmark Scottish Water's costs against Ofwat's modelled costs for EDM installation only.[58]

[55] Ofwat (2024), 'PR24 final determinations – Expenditure allowances – enhancement cost modelling appendix', December 2024, pp. 30-32.
[56] Scottish Water (2026), 'Business Plan 2027-2033 Technical Appendices – Efficiency', 26 February 2026, pp.117-118.
[57] Scottish Water (2026), 'Business Plan 2027-2033 Data Table Commentaries – Table 5: Projects and Programmes', 26 February 2026, pp. 7-8.
[58] Ofwat (2025), 'Waste water – MCERTS emergency overflows enhancement expenditure model', republished 26 March 2025, available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ofwat.gov.uk%2Fwp-content%2Fuploads%2F2025%2F03%2FPR24-FD-CA28-Wastewater-MCERTS-emergency-overflows-enhancement-expenditure-model.v3-1.xlsx&wdOrigin=BROWSELINK

1.4.81. On a simple unit cost basis, Scottish Water compares favourably to the median in England and Wales for the installation of event duration monitors, as shown in Figure 2. We therefore consider Scottish Water's costs to be reasonable in this area.

*Figure 2: Comparison of unit cost for event duration monitor deployment (EDM only) in Great Britain (£ per EDM)*




1.4.82. Table 57 sets out our draft allowance.

*Table 57: Draft Determination allowance for network monitoring*

| Network monitoring | Value |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £9m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £9m |
| Draft outputs to be delivered over 2027-33: Number of Event Duration Monitors deployed | 1,300 |

### *External sewer flooding*

1.4.83. We have benchmarked Scottish Water's costs in this area against their historical performance using data from the Annual Return. As Scottish Water's proposed costs are below historical expenditure, we are satisfied that their proposal represents efficient expenditure in this area and therefore are not proposing any further cost challenge.

1.4.84. Table 58 sets out our draft allowance. Note that later in our review process we allow an additional £10 million for Scottish Water to reach a more challenging target for number of areas at risk of external sewer flooding. This is explained in Chapter 4, section 4.6 and Chapter 5, section 5.9 of the main Draft Determination document. The additional investment allocation and the associated additional outcomes and outputs are not reflected in this appendix.

*Table 58: Draft Determination allowance for external sewer flooding*

| External sewer flooding | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £45m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £45m |
| Draft outputs to be delivered over 2027-33: Number of properties removed from external flooding at risk register | 624 |

### External engineering review of the business plan

*Summary of findings*

1.4.85. Regarding the programme for addressing internal sewer flooding, which had an estimated total value of around £111 million (2024-25 prices) in the draft business plan, WSP considers that Scottish Water has a mature process for prioritising and delivering flood mitigation. Lower-cost projects offer good value; however, WSP recommended that higher-cost projects be further scrutinised for value for money, and that multi-driver projects provide greater transparency into how costs are allocated to each investment driver.[59]

*Evidence from the final business plan*

1.4.86. We have further reviewed the investment addressing internal sewer flooding in the final business plan submission, as explained in the following paragraphs.

1.4.87. Scottish Water's proposed programme cost for reducing flood risk to customers affected by repeat high-consequence internal sewer flooding has been reduced by 25% between the draft and final business plan, from £111 million in the draft to £84 million in the final (2024-25 prices).

1.4.88. In the draft determination, we are not proposing a cost efficiency challenge for the internal sewer flooding programme. However, as discussed in section 4.6 of the Draft Determination, we are applying a more ambitious performance profile than Scottish Water has proposed for the two internal sewer flooding outcomes. Specifically, we are setting a lower starting

[59] These are projects which address more than one investment need, or driver, e.g. internal flooding enhancements, Unsatisfactory Intermittent Discharges requirements, growth-related investments, and capital maintenance.

position for the number of internal sewer flooding incidents, and a lower starting position in combination with an overall reduction in the number of properties at risk of internal sewer flooding (where Scottish Water has forecast no overall change through the period).

1.4.89. Furthermore, as per paragraph 1.2.60, WSP reviewed 8 additional wastewater programmes from the final business plan submission, which are covered in the following paragraphs:

- Maintain critical and non-critical sewers – £295 million in SRC27 (2024-25 prices);
- Unsatisfactory Intermittent Discharges programme – £260 million in SRC27 (2024-25 prices);
- Maintain sludge treatment centres to ensure a quality product: sludge reception & cleaning, digestion & stabilisation, sludge storage, return liquor treatment, thermal drying and pelletising – £122 million in SRC27 (2024-25 prices);
- Asset maintenance for returning PFI assets (excluding Daldowie) – £118 million in SRC27 (2024-25 prices);
- Maintain treatment ancillaries including tanks, buildings, instrumentation, washwater, chemical dosing, sampling, tertiary lagoon – £114 million in SRC27 (2024-25 prices);
- Maintain secondary treatment including tanks, septic tanks, activated sludge assets, wet well, instrumentation, BAF filter, reed bed – £112 million in SRC27 (2024-25 prices);
- Maintain inlet works including inlet, screening, grit removal and storm tanks – £82 million in SRC27 (2024-25 prices); and
- Provision of appropriate equipment and analysis to demonstrate pass forward flow (PFF) spill compliance at WWTW and that flow is maintained during the event duration – £65 million in SRC27 (2024-25 prices).

1.4.90. The review of programme to maintain sewers (£295 million in SRC27) found that the investment need for SRC27 sewer capital maintenance is clearly justified, policy compliant, and strategically sound, supported by statutory duties, Ministerial Objectives, and a demonstrated understanding of asset risk and deterioration. The scope of the solutions is broadly appropriate, with a balanced mix of planned and reactive interventions informed by asset risk modelling and established management approaches, and a delivery model that has been proven in previous regulatory periods. The chosen policy options and solutions for the 3 activities in this programme are appropriate and in line with industry practice for a sewer maintenance programme. However, while the need and strategic intent are strong, the main weaknesses relate to cost definition, assurance, and maturity of supporting evidence. The unit rates are broadly appropriate; however, these cost estimates rely heavily on historic unit rates with limited adjustment for future market conditions, insufficient benchmarking, and unclear assumptions. This limits cost efficiency and increases the risk of higher overall programme costs due to uncertainties. Climate change impacts and efficiency opportunities are acknowledged but not yet translated into targeted, costed interventions. Based on this,

WSP recommended a cost challenge between 3% and 5%, reflecting the high number of assumptions used in estimating the costs (which are not clearly defined or sufficiently transparent) and the resulting uncertainties.

1.4.91. We have decided not to apply a cost challenge in this area. However, we will actively monitor the investment in this area during the period, and we expect Scottish Water to outperform its final business plan forecasts.

1.4.92. The review of the programme to address Unsatisfactory Intermittent Discharges (UIDs) (£260 million in SRC27) found that the investment need is clearly and robustly justified, supported by legislative drivers, regulatory alignment, environmental evidence, and a structured, risk-based policy framework agreed with SEPA. The investment need and scope are appropriate, proportionate, and supported by a robust, evidence-based prioritisation framework and a credible delivery strategy, including adoption of the DV4 enterprise model. Overall, the average unit rates for both Water Quality drivers and Sewer-Related Debris (SRD) drivers are generally considered acceptable and are comparable to those observed in England and Wales UID projects. However, confidence is reduced by gaps in cost assurance and economic evidence, particularly the heavy reliance on indicative unit rates, limited benchmarking, and the absence of project-level cost-benefit analysis. The majority of this programme is still at early stages of development and has yet to go through the gated progress and will lean towards high costs throughout the programme lifecycle. Scottish Water does recognise this and is intending to mitigate this by more efficient delivery process defined by its enterprise delivery model. While delivery capability is credible and improving, stronger cost transparency, benchmarking (especially for standard SRD interventions), and clearer demonstration of efficiency benefits are required to fully validate value for money and reduce delivery risk in SR27.

1.4.93. WSP considered that a potential cost challenge between 10% and 15% could be applied due to costs being immature and relying heavily on assumptions and engineering judgement with limited scope definition. However, we consider there is a risk of cost escalation for the UID programme, given the complexity of some of the required solutions, as we observed during the 2021-27 regulatory period. As such, we have not applied a specific cost challenge for UIDs in our Draft Determination. We may revisit the scope for a cost challenge for the Final Determination.

1.4.94. The review of programme to maintain sludge treatment centres (£112 million in SRC27) determined that the need to invest in planned and responsive maintenance at the bioresource dewatering and treatment centres is clearly demonstrated, justified and defined – all covered assets are critical since failure to treat bioresources appropriately could lead to odour nuisance, permit breaches or Category 1 pollution incidents. The proposed solution scope is appropriate – the engineering solutions that would flow from the investment are anticipated to be industry-standard and therefore to have known cost/risk profiles. Costs

appear appropriate to the number of sites and planning stage, with assumptions based on "engineering judgement, recent experience and knowledge of the overall asset base and local knowledge of the sites". Based on this review, we do not propose a cost challenge in this area.

1.4.95. The review of the programme to maintain returning PFI assets (£118 million in SRC27) found that the investment need is clearly established and aligned with Ministerial Objectives. Several critical wastewater assets, serving 37% of Scotland's population, will return to Scottish Water ownership; operational control with limited contractual hand back requirements and a managed and timely transition is essential to mitigate and manage the risk to service, operations and regulatory compliance. Given the contractual obligations upon expiry of these PFI contracts, the scope for each programme, while limited, appears well defined and appropriate to meet the investment need of maintaining service standards. However, there are multiple concerns around how the cost estimates were derived:

- Scottish Water's asset models assume that assets will be returned to Scottish Water with little or no asset life remaining. This high-level assumption can lead to over-forecasting and estimation of the capital maintenance needs at the outset, leading to increased cost for each PFI;
- Risk allocations make up 45% of the proposed programme costs, determined using engineering judgment and historical information on similar projects, but the assumptions lack any robust descriptions. No risk model has been produced to show reasonable scenarios for asset condition at contract expiry and projected costs. The PFI External Assurance Report V1.3 produced by Gleeds also highlights that risk and capital allocations are high-level and recommends increased transparency of the risk calculations;
- There are no efficiencies built into transition costs – a blanket £1 million per PFI expiry has been allocated to the transition, based on historic run rates from already expired PFI contracts; however, it could be reasonable to assume there would be efficiencies to make as Scottish Water becomes more familiar with the transition requirements; and
- Cost data from previous PFI returns (Allanfearn, Nigg, Persley and Peterhead PFI in 2022) suggests cost reductions should be applied to this PFI programme.

1.4.96. For these reasons, WSP recommended a cost challenge between 10% and 15%. Based on this review, we have questions about whether some maintenance costs are duplicated or proportionate. However, we have not applied a further cost challenge to maintenance investment. We consider that these findings provide further support for our cost challenge to the operating expenditure from returning PFI sites, as set out in Chapter 6 of the Draft Determination. We may revisit this position for the Final Determination.

1.4.97. The review of the programme to maintain treatment ancillaries (£114 million in SRC27) found that the investment need is clearly defined and justified, and the scope of options is appropriate for the given risk appetite and required outcomes. Costs have been determined using models for the asset classes to determine the volume of interventions over the regulatory period, and costed with Scottish Water's in-house cost models, which are appropriate for the breadth and scope of the project. Unit costs are derived from cost models using Gate 90 and Gate 110 (outturn) supplier costs and seem broadly reasonable for this type of programme.

1.4.98. The review of the programme to maintain secondary treatment (£112 million in SRC27) found that the investment need is clearly defined and justified and the scope of options is appropriate for the given risk appetite and required outcomes. Costs have been determined using models for the asset classes to determine the volume of interventions over the regulatory period, and costed with Scottish Water in-house cost models, which is appropriate for the breadth and scope of the project. Unit costs are derived from informed engineering judgement and cost models using Gate 90 and Gate 110 (outturn) supplier costs. External benchmarking (by ChandlerKBS/Cumming Group, commissioned by Scottish Water) shows material cost variances to the industry median benchmark for two of the associated cost curves (cost variances of over 50%). Scottish Water has noted that further data collection is required and will continue to look at sourcing additional data points to improve confidence in this area. We consider that the costs for the constituent assets in the programme are reasonable compared to the industry benchmark. However, the programme unit costs are based on 'representative assets', whereas the associated management approach (MA043) lacks detail on variations in size, type, service, and actuation of the assets, which would impact their unit costs. Based on this, WSP recommended a cost challenge between 7% and 10% and, as such, we apply a 10% cost challenge in this area in the Draft Determination.

1.4.99. Table 59 sets out our proposed cost challenge and our Draft Determination allowance.

*Table 59: Draft Determination allowance for maintaining secondary treatment*[60]

| Maintain secondary treatment | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £112m |
| Cost challenge (2024-25 prices) | -£11m |
| Draft allowance (2024-25 prices) | £100m |
| Draft outputs to be delivered over 2027-33: Number of WWTW secondary treatment asset interventions | 329 |

1.4.100. The review of the programme to maintain inlet works (£82 million in SRC27) found that the scope of options is appropriate for the given risk appetite and required outcomes. Costs

[60] Numbers do not add up due to rounding.

have been determined using models for the asset classes to determine the volume of interventions over the regulatory period, and costed with Scottish Water's in-house cost models, which are appropriate for the breadth and scope of the project. Unit costs are derived from informed engineering judgement and cost models using Gate 90 and Gate 110 (outturn) supplier costs. However, while WSP noted that costs appear to be reasonable for this type of programme, it could not make an appropriate observation of the unit costs as there is no detail to the average size / type of the assets included in the derivation of the average unit cost, or the assets covered by the programme. As per WSP's recommendation, we ask that Scottish Water provide a further detailed explanation for how the unit costs for this programme have been derived in its response to the Draft Determination consultation, including how average asset and equipment costs were calculated, the data sources used, and the key factors influencing these estimates. We will review this as part of our Final Determination.

1.4.101. The review of the programme for PFF compliance (£65 million in SRC27) found that the proposed scope is proportionate and appropriate given the current level of maturity and uncertainty. The primary driver is regulatory, with SEPA clearly signalling that a lack of evidence on Pass Forward Flow compliance will not be acceptable under the Environmental Performance Assessment Scheme, regardless of whether actual non-compliance exists. The initial focus on enhanced monitoring and data integration is appropriate as a first step to establish compliance status, recognising that monitoring alone does not resolve non-compliance but enables informed decisions on operational, licensing or capital interventions. As there is no management approach to detail the specific scope of work, WSP cannot assure that the scope will meet the requirements set out by SEPA. WSP recommended WICS should seek confirmation from SEPA that the proposed solution will meet the required need. We require Scottish Water to confirm this with SEPA and provide an update in Scottish Water's response to our Draft Determination consultation.

1.4.102. Cost estimates are high-level and reliant on professional judgement, with reasonable unit assumptions for monitoring installation, but limited supporting evidence for wider programme allowances at this stage, creating uncertainty over affordability and future funding requirements. Due to the low level of programme maturity, WSP did not recommend a cost challenge but recommended that WICS continue to assess this programme as it develops through the 2027-33 period. Based on this, we do not propose a cost challenge for this area, but we will monitor its development and delivery.

### Conclusion of review of investment related to water environment

1.4.103. Table 60 below summarises WICS' draft allowance for each investment programme within the water environment and managing quantity of flows areas following our review as explained in this section. As explained in Chapter 5 of the Draft Determination, we also apply a further efficiency productivity challenge to this allowance, and we also allow some

additional investment, which we have not allocated to a specific investment programme or project. These adjustments are not captured in the table below

1.4.104. Table 61 and Table 62 below outline the relevant enhancement and asset maintenance outputs respectively for the water environment and managing quantity of flows areas which we expect to be delivered for the allowed investment in this appendix (i.e. the tables do not reflect the additional outputs we expect Scottish Water to deliver with the additional investment allocations we make in Chapter 5 of the main Draft Determination document). Where there are no listed asset maintenance outputs, we require Scottish Water to confirm the forecast number of interventions or outputs in its response to our Draft Determination.

*Table 60: Draft Determination allowance for water environment and managing flows investment (excluding West Central Bioresources)*[61]

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA003 - Water Environment | Waste Water Treatment | 983 | 966 | Removal of the project Pathhead WWTW (-£6 million) and cost challenge on the programme for maintaining secondary treatment processes (-£11 million). |
| TA003 - Water Environment | Waste Water Bioresource Treatment | 157 | 138 | Removal of the project Allanfearn STC for replacing digestors (-£19.5 million). |
| TA003 - Water Environment | Water Treatment Works Sludge Storage | 17 | 17 | |
| TA003 - Water Environment | Waste Water Sewer Networks | 413 | 413 | |
| TA003 - Water Environment | Waste Water Other – Region Wide | 291 | 291 | |
| TA003 - Water Environment | Water Abstraction - Water Resources Environmental Monitoring and Compliance | 6 | 6 | |
| TA003 - Water Environment | Water Reservoir Compensation Compliance and RBMP Enhancement | 40 | 40 | |
| TA003 - Water Environment | Other PFI Transfers | 7 | 7 | |

[61] WICS' draft allowance in this table is before applying an additional productivity efficiency challenge and before allowing additional unallocated investment. Please refer to Chapter 5 of the Draft Determination for more details on these further adjustments.

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA004 - Managing Quantity of Flows | Asset Repair, Refurbishment and Replacement (AR3) | 603 | 603 | |
| TA004 - Managing Quantity of Flows | Enhancement | 367 | 367 | |
| | **Total** | **2,885** | **2,848** | |

*Table 61: Enhancement outputs to be delivered with Draft Determination allowance for wastewater*

| Table 2 ref. | Output category | Unit | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 | Total |
|---|---|---|---|---|---|---|---|---|---|
| **T2.11** | Number of Event Duration Monitors (EDM) deployed | Number | 184 | 192 | 208 | 224 | 238 | 254 | **1,300** |
| **T2.12** | Number of unsatisfactory intermittent discharges (UID) improved or removed | Number | 39 | 24 | 7 | 20 | 26 | 34 | **150** |
| **T2.13** | Number of sites with Water Framework Directive improvements | Number | - | - | - | - | - | 18 | **18** |
| **T2.15** | Increase in renewable energy generated | GWh / Annum | - | - | - | 4 | - | - | **4** |
| **T2.16** | Population equivalent of WWTW sites with environmental pollution risk reduced | Population equivalent | - | 757,000 | - | - | - | - | **757,000** |
| **T2.18** | Number of sludge treatment centres achieving compliance with Industrial Emissions Directive | Number | - | - | - | 1 | 1 | 6 | **8** |
| **T2.23** | Number of properties removed from internal flooding at risk register | Number | 34 | 15 | 66 | 60 | 59 | 66 | **300** |
| **T2.24** | Number of properties removed from external flooding at risk register | Number | 40 | 6 | 41 | 63 | 186 | 288 | **624** |

| Table 2 ref. | Output category | Unit | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 | Total |
|---|---|---|---|---|---|---|---|---|---|
| **T2.29** | Population equivalent of WTW sites with legacy sludge issues resolved | Population equivalent | 18,109 | 67,787 | - | - | - | - | **85,896** |
| **T2.32** | Number of wastewater treatment improvement studies | Number | 1 | 3 | 6 | 15 | 18 | 7 | **50** |
| **T2.33** | Number of climate change audits and studies | Number | - | - | 1 | - | - | - | **1** |
| **T2.47** | Number of flow monitors installed at WWTW | Number | - | - | 52 | 52 | 315 | 443 | **862** |
| **T2.49** | Population equivalent of WWTW sites made compliant with standards - phosphorus | Population equivalent | 271,093 | - | - | 14,153 | 22,441 | 112,969 | **420,656** |
| **T2.51** | Population equivalent of WWTW sites made compliant with standards - other | Population equivalent | 17 | 1 | - | - | 320 | 3,000 | **3,338** |
| **T2.52** | Number of screens installed[62] | Number | 39 | 24 | 7 | 20 | 26 | 34 | **150** |
| **T2.58** | Number of flood risk management (Section 16) models | Number | - | - | - | - | - | 68 | **68** |
| **T2.58** | Number of education campaigns targeted at customers in sewer choke hot spot areas | Number | - | - | - | - | - | 1 | **1** |
| **T2.58** | Number of surface water management planning schemes | Number | - | - | - | - | - | 4 | **4** |
| **T2.58** | Number of properties with temporary internal flood prevention measures | Number | 85 | 89 | 96 | 103 | 110 | 117 | **600** |
| **T2.58** | Number of Private Finance Initiative (PFI) sites returned to Scottish Water | Number | - | - | - | 1 | - | - | **1** |
| **T2.58** | Number of catchments with intelligent network technology | Number | 1 | - | - | - | - | - | **1** |

[62] These outputs align to T2.12 as it is assumed those UIDs will be addressed using screening. The number of screens is an estimate of what may be required to resolve the number of UIDs for which this is the appropriate solution. WICS expects both line T2.12 and line T2.52 to be delivered with the same investment allowance.

*Table 62: Replacement, repair and refurbishment outputs to be delivered*

| Primary output | Unit | Total |
|---|---|---|
| Number of WWTW inlet works asset interventions | Number | 745 |
| Number of sites with abstraction and compensation monitoring equipment interventions | Number | 1,283 |
| Length of non-critical sewer interventions | Metres | 128,702 |
| Length of critical sewers interventions | Metres | 13,136 |
| Number of sites with wastewater pipebridge interventions | Number | TBC[63] |
| Length of wastewater pumping main interventions | Metres | 71,228 |
| Number of air valves interventions at wastewater pumping mains | Number | 171 |
| Number of sites with sewage pumping station interventions | Number | 20 |
| Number of Legacy sewage pumping stations improved to meet appropriate standard | Number | 2 |
| Number of wastewater Network Motor Control Centre interventions | Number | 8 |
| Number of screw pumps intervention | Number | 8 |
| Number of sites with sewer structures APNRV or flood mitigation device interventions | Number | 270 |
| Number of Combined Storm Overflow (CSO) screen interventions | Number | 3 |
| Number of storm tank interventions | Number | - |
| Number of Sustainable Drainage system interventions | Number | - |
| Number of sites with sewer structure syphons interventions | Number | - |
| Length of sea outfalls replaced or maintained | Metres | - |
| Number of WWTW primary treatment asset interventions | Number | 45 |
| Number of WWTW secondary treatment asset interventions | Number | 348 |
| Number of WWTW treatment ancillaries asset interventions | Number | 2,641 |
| Number of WWTW odour equipment asset interventions | Number | 53 |
| Number of WWTW sites with temporary process unit interventions | Number | 1 |
| Number of site welfare facilities interventions - WWTW | Number | 3 |
| Number of sites with security fending or gate interventions - wastewater | Number | 46 |
| Number of redundant or abandoned assets interventions - WWTW | Number | 7 |
| Number of WWTW Motor Control Centre interventions | Number | 12 |
| Number of wastewater SCADA interventions | Number | 96 |
| Number of wastewater telemetry interventions | Number | 406 |
| Number of sludge treatment centre asset interventions | Number | 249 |
| Number of wastewater network models maintained | Number | 452 |
| Number of fixed wire electrical system or statutory maintenance asset interventions | Number | - |
| Number of high voltage system interventions | Number | 7 |
| Number of fixed wire electrical system asset interventions | Number | - |
| Number of street furniture interventions | Number | - |

[63] Refer to paragraph 1.4.26.

| | | |
|---|---|---|
| Number of WWTW statutory maintenance asset interventions | Number | - |
| Number of ATOM wastewater network asset interventions | Number | - |
| Number of ATOM wastewater treatment asset interventions | Number | - |
| Number of wastewater property operational building interventions | Number | 6 |
| Number of Private Finance Initiative (PFI) sites returned to Scottish Water | Number | 7 |

## 1.5. Review of investment related to growth

1.5.1. There are different arrangements in place for growth investment depending on the type of asset. These arrangements vary in terms of who delivers the investment and how the investment costs are recovered. Table 63 provides an overview of the arrangements for each of the infrastructure asset groups, referred to as Parts 1 to 4, for household growth. The arrangements for non-households differ, with non-household developers meeting the cost of upgrading Part 3 and Part 4 infrastructure assets to meet new growth.[64]

*Table 63: Infrastructure asset group*

| Part | Water | Wastewater | Arrangements |
|---|---|---|---|
| 1 | New connections from an individual household to a water main | New connections from an individual household to a sewer | Developers undertake the work and meet these costs |
| 2 | New water mains that connect developments to existing water mains | New sewers that connect developments to existing sewers and some sustainable urban drainage systems (SUDS) | Developers undertake the work and meet the costs<br><br>Scottish Water will provide a reasonable cost contribution, subject to a cap |
| 3 | Existing local bulk infrastructure such as water mains and service reservoirs | Existing local bulk infrastructure such as sewers, wastewater pumping systems and some SUDS | Not attributable to a developer and identified in a strategic network impact assessment:<br><br>Scottish Water undertakes the work<br><br>Scottish Water collects an infrastructure charge from developers |

[64] For more details see Scottish Water (2023), 'Connecting to our local network infrastructure', June 2023, p.14.

| | | | |
|---|---|---|---|
| | | | Attributable to a developer and not identified in a strategic network impact assessment:<br><br>Scottish Water will include the costs of enhancing its existing network assets in its calculation of reasonable cost contribution, subject to a cap |
| 4 | Strategic assets such as water treatment works and water resources | Strategic assets such as wastewater treatment works, biosolid facilities and outfalls | Scottish Water undertakes the work with covers recovered from general charges |

1.5.2. This sub-section focuses on Part 3 and Part 4 growth for water and wastewater. It outlines the investment which Scottish Water proposes to deliver by programme area, and details how WICS has reviewed these proposals by each of the review approaches below:

- Review of investment cases;
- Benchmarking review; and
- External engineering review.

### Summary of Scottish Water's proposals in the final business plan

1.5.3. Table 64 below outlines the investment Scottish Water proposes to deliver in its final business plan in relation to growth in connections.

*Table 64: Business plan investment for growth*

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) |
|---|---|---|
| TA005 - Enabling Growth | Waste water Growth | 319 |
| TA005 - Enabling Growth | Water Growth | 71 |
| TA005 - Enabling Growth | Infrastructure Investment | 123 |
| TA005 - Enabling Growth | Service Relocations | 38 |
| | **Total** | **551** |

### Review of investment cases

1.5.4. We conducted an engineering review of 13 projects, valued at greater than £6 million, covered by the enabling growth technical appendix. These 13 projects have a combined value of £236 million. The results of our review, assessed against the criteria set out in paragraphs 1.2.21 to 1.2.27, are shown in Table 65.

1.5.5. Of the 13 projects, 8 were assessed with a Green RAG score, meaning these investments are allowed. 2 were assessed with an Amber RAG score, meaning WICS have reservations regarding one or more assessment criteria and 3 have a Red RAG score meaning investment may not be allowed.

*Table 65: Assessment summary of growth-related project investment cases*

| Investment Code | Investment Name | Value in SRC27 (2024-25; £m) | Service | Primary Technical Appendix | RAG Score: Needs & Options | RAG Score: Regulatory Engagement | RAG Score: Cost Estimate | RAG Score: Benefits & Risk | RAG Score: Overall Assessment |
|---|---|---|---|---|---|---|---|---|---|
| 5363112919 | New Bandeath WwTW - Growth | 50 | Wastewater | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363118737 | S-WW-140325-Stirling WWTW Growth and CM | 36 | Wastewater | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112948 | Erskine WwTW - Growth | 19 | Wastewater | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110167 | AVSE - Growth (capex) Seafield | 18 | Wastewater | Enabling Growth | GREEN | GREEN | RED | GREEN | RED |
| 5363110880 | SR21 Tiree Resilience | 21 | Water | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363110881 | SR21 Taymouth Growth | 16 | Water | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112574 | Persley Growth from Aberdeen Strategy | 19 | Wastewater | Enabling Growth | AMBER | GREEN | RED | AMBER | RED |
| 5363112576 | Nigg Growth small option | 19 | Wastewater | Enabling Growth | AMBER | GREEN | RED | AMBER | RED |
| 5363112906 | Rosewell WwTW Growth | 9 | Wastewater | Enabling Growth | GREEN | GREEN | AMBER | GREEN | AMBER |
| 5363112907 | Roslin WwTW Growth | 7 | Wastewater | Enabling Growth | GREEN | GREEN | AMBER | GREEN | AMBER |
| 5363112911 | Meigle WwTW - Growth | 7 | Wastewater | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112912 | Oldmeldrum WwTW - Growth | 8 | Wastewater | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| 5363112935 | Ballater WwTW - Growth | 6 | Wastewater | Enabling Growth | GREEN | GREEN | GREEN | GREEN | GREEN |
| | **Total** | **236** | | | | | | | |

*East Stirling Villages*

1.5.6. This scheme includes two projects: New Bandeath WwTW - Growth and Stirling WwTW Growth and Capital Maintenance, with a combined investment value of £86 million in SRC27. The overall RAG assessment for these two projects is Green. This RAG score was revised from Amber after WICS queried the project costs and timing. The SRC27 final business plan budget (£86 million) is lower than the cost estimation of £117 million given in the most recent Project Investment Appraisal.[65] We queried this difference and Scottish Water's response explained that "At present there is capacity available at both Stirling WWTW and the existing Bandeath WWTW and as such the two projects are in the early stages of development. It is expected that the construction phase of the project will most likely start in SR27 and extend into the SR33 period rather than be fully completed in SR27. Therefore, the investment in the FBP has been reduced in comparison to the Stage 3a assessment to reflect this."

1.5.7. WICS accepts this response in respect to why the final business plan budget is lower than the appraised capital cost, and it is noted that for both projects, the total capital cost and their timing will span the 2027-33 and 2033 regulatory periods. It is also noted that the forecast dates for these two projects given the final business plan show completion within SRC27 and, therefore, do not align with the query response outlined in paragraph 1.5.6.

*Projects assessed with a Red RAG score*

1.5.8. **AVSE – Growth (capex) Seafield**: this is a major strategic project to invest in Seafield wastewater treatment works (WwTW) to increase treatment capacity to accommodate forecast growth in the Edinburgh catchment area. WwTW capacity is expected to be reached in 2031.

1.5.9. The Edinburgh Growth Strategy Final Report 2020, presented as evidence to support this investment, recommends:[66]

- Development of Option 3 – A new WwTW at Seafield with an indicative capex cost of £120 million to £140 million (2020 prices); and
- A programme of pilot trials/outline design/public consultation/planning and detailed design over a 9-year period starting in 2020 such that construction will be completed when:
  - The expected growth in population will potentially compromise compliance (2031); and
  - The PFI contract ends in 2029.

[65] Scottish Water (2025), "Stage 3a: Outline Investment Appraisal Level 1 East Stirling Villages Growth 502762000", January 2025, Section 2.2, Table 1, p. 8.
[66] m2 (2020), "Edinburgh Growth Strategy – Final Report – Part 1 (version 2)", 27 August 2020, pp. 19-20.

1.5.10. Whilst we recognise that the Seafield WwTW project is still at an early stage, WICS are concerned that a budget of under £18 million, with no defined tasks or objectives, will not progress the strategic aims of this project and customers will not see any benefit from the expenditure.

1.5.11. **Nigg Growth small option** and **Persley Growth from Aberdeen Strategy:** taken together, these two projects set out the strategy to address the medium to long-term needs required to address asset maintenance issues together with forecast future growth through increased wastewater treatment capacity in the Aberdeen catchment area.

1.5.12. WICS recognises that these projects are at an early stage with solutions not yet identified. Capital investment can be expected to extend beyond the 2027-33 regulatory period given the scale of the likely solutions (which could range from additional primary and secondary treatment processes to new treatment works). We also note the initial cost estimates of £50 million for the Nigg WwTW and £30 million for Persley WwTW, given in the relevant Project Investment Appraisals, compared with the final business plan budget of £19 million allocated to each project (£38 million in total).[67, 68] WICS has concerns that, without any defined tasks or objectives for SRC27, the allocated budget will not advance the strategic aims of these projects, and customers may only see limited benefit from the expenditure.

*Other projects assessed as Amber RAG score*

1.5.13. **Rosewell WwTW Growth** and **Roslin WwTW Growth**: these two projects are part of the Midlothian Strategy for wastewater and, therefore, were assessed together as the proposed solution to accommodate growth at the respective treatment works is a shared option. That is, the decommissioning of Rosewell WwTW and the transfer of flow to a much upgraded and enlarged Roslin WwTW. The two projects together have a combined final business plan budget of £16 million. The cost estimate in the latest Project Investment Appraisal is £21 million.[69]

1.5.14. WICS asked Scottish Water for the reasons behind this cost reduction. In a response to our query, [70] Scottish Water advised that the Project Investment Appraisal cost could be compared to the inflated outturn cost of £18 million given in the final business plan.[71] However, WICS does not consider this a like-for-like comparison since the project appraisal cost estimate is not inflated over the SRC27 period.

[67] Scottish Water (2025), "Stage 1: Case for Change Level 1 Nigg Wastewater Treatment Works – Growth DRAFT, version 1.0", 10 November 2025, Section 4.5, p. 19.
[68] Scottish Water (2026), "Stage 1: Case for Change Level 1 Persley WwTW – Growth DRAFT version 1.0", 11 February 2026, Section 4.5, p. 18.
[69] Scottish Water (2024), "Stage 3a: Outline Investment Appraisal Level 2 Midlothian Strategy Rosewell and Roslin WwTW version 1.0, 20 March 2024, Table 3, p. 11.
[70] WICS query reference 07-15 issued 10/04/2026 and reply from Scottish Water dated 28/04/2026
[71] Final Business Plan Submission, Data Tables, Table X, column labelled Total Expenditure (OT).

1.5.15. The scope of the proposed solution includes a major rebuild of Roslin WwTW on a congested site location, plus 4km of transfer pipeline through difficult terrain. Given the construction risks noted in the project appraisal, WICS has concerns about cost escalation for that project.

*Conclusions reflected in the main draft determination document*

1.5.16. Our draft allowance includes Scottish Water's forecast costs for progressing the strategic projects to increase wastewater treatment capacity in the **Edinburgh and Aberdeen catchment areas** (Seafield, Nigg and Persley). However, we require Scottish Water to confirm what it will deliver in relation to this expenditure over the 2027-33 regulatory period in its response to our Draft Determination. This will enable us to monitor expenditure and progress on these important strategic projects to ensure customers can see progress towards the longer-term benefits that will eventually be delivered.

1.5.17. The final business plan budget for the Seafield, Nigg and Persley wastewater treatment projects totals £55 million. In response to our query,[72] Scottish Water advised that this budget is "to undertake study and development work to gate 50". If this is the case, we consider this budget to be too high and outside industry norms for project preparation and outline design. As such, we may consider applying a cost challenge in this area in the Final Determination.

### Benchmarking

1.5.18. Table 66 sets out the investment areas subject to benchmarking for growth and our assessment.

*Table 66: Assessment summary of growth-related areas suitable for benchmarking*

| Area | Programme | Sub-area ("Investment Area") | Sub-area investment (2024-25 prices; £m) | WICS Assessment |
|---|---|---|---|---|
| Enabling Growth | Waste water Growth | Provision of Part 4 capacity to meet strategic & local growth requirements | 319 | No cost challenge proposed |
| Enabling Growth | Water Growth | Provision of Part 4 capacity to meet strategic & local growth requirements | 69 | No cost challenge proposed |
| Enabling Growth | Infrastructure Investment | (Part 3) Provision of strategic capacity in our networks to meet new demand - Wastewater | 69 | Scottish Water provided updated cost estimates. No cost |

[72] WICS query reference 06-07 issued 02/04/2026 and reply from Scottish Water dated 07/05/2026

| | | | | |
|---|---|---|---|---|
| | | | | challenge proposed. |
| Enabling Growth | Infrastructure Investment | (Part 3) Enable economic growth - Water | 55 | Scottish Water provided updated cost estimates. No cost challenge proposed. |
| Enabling Growth | Service Relocations | Comply with legislative requirements - (Water & Wastewater) | 38 | Cost challenge proposed |
| | | **Total** | **551** | |

### *Part 4 growth - wastewater*

1.5.19. As set out in Table 63, part 4 wastewater growth relates to the costs for upgrading wastewater treatment works and outfalls to accommodate population growth. Scottish Water's investment in this area primarily focuses on increasing capacity at wastewater treatment works. Ofwat developed econometric models for growth at wastewater treatment works. One of these models was a linear model that identified that the following factors explain the level of growth investment at a project level at wastewater treatment works:[73]

- added process capacity;
- higher treatment requirements for ammonia (based on change in ammonia permits); and
- expected changes in requirements for dry weather flow permits.[74]

1.5.20. The models included 255 company observations and had an adjusted R-squared of 0.436.

1.5.21. We were unable to replicate Ofwat's model to include Scottish Water due to the lack of equivalent data for Scottish Water. As such, we tested different models using data available for both Scottish Water and the wastewater companies in England and Wales. The most statistically robust model that made sense from an operational/engineering perspective was a linear project-level model with one explanatory variable: total population equivalent added. We consider the total population added to be a key determinant of wastewater growth costs.

[73] Ofwat (2024), 'PR24 final determinations: expenditure allowances – enhancement cost modelling appendix', 12 December 2024, pp.102-103.
[74] Dry weather flow relates to the average daily flow to a wastewater treatment works to a wastewater treatment works during a period without rain.

1.5.22. To improve statistical robustness, we also removed projects equivalent to adding a large wastewater treatment works (serving a population equivalent to more than 25,000). We have examined these projects for Scottish Water as part of our engineering review. Table 67 shows the model's outputs.

*Table 67: Growth at wastewater treatment works*

| Growth at wastewater treatment works | Values |
|---|---|
| Total capacity added | 0.0014***[75] |
| Constant | 3.11*** |
| Adjusted R-squared | 0.38 |
| Observations | 291 |

1.5.23. We note that the model's coefficients have signs, magnitudes, and statistical significance similar to those of Ofwat's econometric model. Furthermore, the model's overall statistical robustness, as measured by R-squared, is also similar.

1.5.24. Table 68 shows Scottish Water's forecast wastewater growth investment, the investment we have included in the model, the efficient cost based on the median efficient company in Great Britain and the efficiency score for Scottish Water.

*Table 68: Scottish Water's assessed efficiency score*

| Growth at wastewater treatment works | Value |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £319m |
| Scottish Water modelled expenditure (2024-25 prices) | £207m |
| Expenditure associated with a median efficient company (2024-25 prices) | £217m |
| Scottish Water assessed efficiency score relative to median | 0.95 |

1.5.25. Table 67 shows that Scottish Water's forecast wastewater treatment works growth investment is 0.95 of the median efficient company – i.e. 5% lower than the median efficient company. We therefore consider that costs are reasonable in this area

1.5.26. Table 69 sets out our draft determination allowance and associated outputs for wastewater treatment works growth (Part 4).

[75] ***denotes significance at the 0.1% level, which means that we can have 99.9% confidence that total capacity added explains the level of investment in this area.

*Table 69: Draft Determination allowance for wastewater treatment works growth*

| Part 4 growth - wastewater | Value |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £319m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £319m |
| Draft outputs to be delivered over 2027-33: Additional population equivalent served at wastewater treatment works | 174,642 |

### *Part 4 growth - water*

1.5.27. Three projects make up this investment area, two of which are island-based. Given the bespoke nature of these projects, external benchmarking is not possible. However, we covered the largest of these projects, the Tiree resilience project, as part of our review of investment cases shown in Table 65.

### *Part 3 strategic capacity – water and wastewater*

1.5.28. As set out in Table 63, part 3 strategic capacity refers to upgrades to local bulk infrastructure such as water mains, service reservoirs, sewers, wastewater pumping systems and some sustainable urban drainage systems (SUDS) to meet new growth. Scottish Water recovers the costs through infrastructure charges if the upgrades are not attributable to a particular developer and are identified during a strategic network impact assessment.

1.5.29. Upon receiving the final business plan, we initially benchmarked Scottish Water's Part 3 growth investment for water (£55 million) and for wastewater (£69 million) against the equivalent investment for companies in England and Wales which is known as network reinforcement. [76]

1.5.30. However, through our review of the plan, we found out that while Scottish Water was proposing £123 million investment in Part 3 growth, it was forecasting to receive income from infrastructure charges of only £84 million. We asked Scottish Water how it proposes to fund the c.£40 million difference between investment and income. Scottish Water explained it would have to be funded either through primary charges or through a separate mechanism to be agreed with WICS. WICS does not agree that such investment should be funded through primary charges and has requested that Scottish Water submit a proposal for a cost-reflective infrastructure charge. Scottish Water's proposal provided a profile of forecast Part 3 growth investment in SRC27 (covering both water and wastewater) of £111 million in outturn prices, or £96 million in 2024-25 prices, along with a revised profile for investment-

[76] For further information see Ofwat (2024), 'PR24 final determinations, expenditure allowances – base cost modelling decision appendix', 12 December 2024.

reflective infrastructure charge income which would be sufficient to fully fund the investment.

1.5.31. We have accepted this revised investment profile and used it to determine our draft allowances for water and wastewater, allocating them to each service based on the proportional split from the original final business plan proposal of £123 million. Table 70 shows our draft allowance and the proposed outputs to be delivered for water while Table 71 shows this for wastewater.

*Table 70: Draft Determination allowance for part 3 strategic capacity – water*

| Part 3 Strategic Capacity - Water | Values |
|---|---|
| Scottish Water forecast expenditure in the business plan (2024-25 prices) | £55m |
| Impact of Scottish Water's updated estimate (2024-25 prices) | -£12m |
| Draft allowance (2024-25 prices) | £43m |
| Draft primary outputs to be delivered over 2027-33: Additional Part 3 strategic capacity (Ml/d) | 6.4 |
| Draft secondary outputs to be delivered over 2027-33: Number of properties connected[77] | 124,904 |

*Table 71: Draft Determination allowance for part 3 strategic capacity – wastewater[78]*

| Part 3 Strategic Capacity - Wastewater | Values |
|---|---|
| Scottish Water forecast expenditure in the business plan (2024-25 prices) | £69m |
| Impact of Scottish Water's updated estimate (2024-25 prices) | -£15m |
| Draft allowance (2024-25 prices) | £53m |
| Draft primary outputs to be delivered over 2027-33: Additional Part 3 strategic capacity (population equivalent) | 87,601 |
| Draft secondary outputs to be delivered over 2027-33: Number of properties connected[79] | 121,106 |

### *Water and wastewater service relocations*

1.5.32. We have compared Scottish Water's proposed expenditure on service relocations to its expenditure to date in the 2021-27 regulatory period, which covers the years 2021-22 to 2024-25. Using this benchmark, we find that Scottish Water's proposed expenditure in this

[77] Calculated from the increase in connected properties in business plan Table 7.
[78] Numbers do not add up due to rounding.
[79] Calculated from business plan data Table 7.

area is higher compared to its past expenditure. Scottish Water has not provided evidence to explain why the proposed expenditure is higher in the 2027-33 regulatory period.

*Table 72: Draft Determination allowance for service relocations*

| Water and wastewater service relocations | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £38m |
| Cost challenge (2024-25 prices) | -£10m |
| Draft allowance (2024-25 prices) | £28m |
| Draft outputs to be delivered over 2027-33: Length of water service relocations (metres) | 25 |
| Draft outputs to be delivered over 2027-33: Length of wastewater service relocations (km) | 0 |

1.5.33. Recognising that Scottish Water has not provided evidence to explain the step increase proposed for the 2027-33 regulatory period, we propose aligning its proposed expenditure to the level it has incurred in the 2021-27 regulatory period. This is equivalent to a cost challenge of 26% or £10 million, giving a draft allowance of £28 million.

### External engineering review of the business plan

*Review following the draft business plan submission*

1.5.34. Following the draft business plan submission, WSP reviewed the North Berwick Wastewater Treatment Works project.

1.5.35. The estimated total value of the project in SRC27 was £75 million (2023-24 prices), equivalent to £76 million in 2024-25 prices. The proposed investment solution was considered to be appropriate for the current effluent targets, and to offer flexibility for future changes. However, it was highlighted that there is a possibility the scope of the solution exceeds what is required to meet the outcome – the assumed impact of network infiltration may be too high, and there could be an option for the network to be modified to reduce infiltration rates which would impact the overall design scope.

1.5.36. The cost estimates are relatively immature; however, the proposed option delivers a sound response to immediate regulatory requirements and affords headroom for future growth. We therefore consider that costs are reasonable in this area.

*Review following the final business plan submission*

1.5.37. The cost estimate for this project is £75 million (2024-25 prices) in the final business plan. Given the cost has not materially moved from the draft business plan, we will adhere to our earlier feedback and not propose a cost challenge on this project.

### Conclusion of review of investment related to growth

1.5.38. Table 73 below summarises WICS' draft allowance for each investment programme within the enabling growth area following our review as explained in this section. As explained in Chapter 5 of the Draft Determination, we also apply a further efficiency productivity challenge to this allowance which is not captured in the table below

1.5.39. Table 74 below outlines the relevant enhancement outputs for the enabling growth area which we expect to be delivered for the allowed investment.

*Table 73: Draft Determination allowance for growth investment*[80]

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA005 - Enabling Growth | Waste water Growth | 319 | 319 | |
| TA005 - Enabling Growth | Water Growth | 71 | 71 | |
| TA005 - Enabling Growth | Infrastructure Investment | 123 | 96 | Reducing allowance for Part 3 growth investment as per Scottish Water's updated expenditure forecast for water (-£12 million) and for wastewater (-£15 million). |
| TA005 - Enabling Growth | Service Relocations | 38 | 28 | Cost challenge on the programme for service relocations (-£10 million). |
| | **Total** | **551** | **514** | |

[80] WICS' draft allowance in this table is before applying an additional productivity efficiency challenge. Please refer to Chapter 5 of the Draft Determination for more details on this further adjustment.

*Table 74: Growth outputs to be delivered with Draft Determination allowance*

| Table 2 ref. | Output category | Unit | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 | Total |
|---|---|---|---|---|---|---|---|---|---|
| **T2.1** | Increase in Part 4 capacity at WTW | Ml/d | - | - | - | 0 | - | 3 | **3** |
| **T2.2** | Increase in Part 4 capacity to meet wastewater growth requirements | Population equivalent | 2,778 | 31,587 | 5,886 | 23,802 | 32,462 | 78,127 | **174,642** |
| **T2.3** | Additional Part 3 capacity enabled from strategic water network reinforcement | Ml/d | - | 0 | - | 6 | - | - | **6** |
| **T2.4** | Additional Part 3 capacity enabled from strategic wastewater network reinforcement | Population equivalent | 43,315 | 22,158 | 4,001 | 17,000 | - | 1,127 | **87,601** |
| **T2.30** | Length of service relocations - water mains | km | 6 | 3 | 4 | 4 | 4 | 4 | **25** |

## 1.6. Review of investment related to other areas (climate change adaptation and mitigation, support services and other)

1.6.1. This section outlines the investment which Scottish Water proposes to deliver in the following remaining areas:

- Climate change adaptation;
- Climate change mitigation;
- Customer and communities;
- Digital;
- Transformation and innovation; and
- Support services.

1.6.2. This section then details how WICS has reviewed these proposals by each of the review approaches below:

- Review of investment cases;
- Review of asset maintenance investment; and
- Benchmarking review.

### Summary of Scottish Water's proposals in the final business plan

1.6.3. Table 75 below outlines the investment Scottish Water proposes to deliver in relation to the remaining programme areas in the final business plan.

*Table 75: Business plan investment for other areas (climate change, support services, and other)*

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) |
|---|---|---|
| TA006 - Climate Adaptation | Enhancement to Scotland's natural capital | 7 |
| TA006 - Climate Adaptation | Increase biodiversity beyond statutory levels | 5 |
| TA006 - Climate Adaptation | Understand the implications of climate change and risks to service resilience | 2 |
| TA007 - Climate Mitigation | Process Emissions | 15 |
| TA007 - Climate Mitigation | Carbon Capture | 29 |
| TA007 - Climate Mitigation | Pilot activities | 16 |
| TA015 - Customer and Communities | Customer Research | 2 |
| TA015 - Customer and Communities | Priority Service Register Improvements | 4 |

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) |
|---|---|---|
| TA015 - Customer and Communities | Digital Developments for Customer Experience enhancements | 5 |
| TA015 - Customer and Communities | Access to assets | 6 |
| TA015 - Customer and Communities | Campaigns & marketing | 4 |
| TA017 - Digital | Efficient planning & delivery | 17 |
| TA017 - Digital | Risk and Security | 46 |
| TA017 - Digital | Commodities & Infrastructure | 44 |
| TA017 - Digital | Intelligent Decision Making | 1 |
| TA018 - Transformation & Innovation | Enable Innovation | 23 |
| TA018 - Transformation & Innovation | Lighthouse projects | 5 |
| TA018 - Transformation & Innovation | Research and Hydro Nation | 4 |
| Support Services | Juniper House | 110 |
| Support Services | Maintain existing fleet | 115 |
| Support Services | Maintain existing offices and estates | 66 |
| Support Services | Maintain existing renewable energy | 18 |
| Support Services | Maintain scientific equipment | 7 |
| | **Total** | **549** |

### Review of investment cases

1.6.4. We undertook an engineering review of only 1 project, valued at greater than £6 million, covered by the support services technical appendix. This project is the proposed replacement of the Juniper House scientific services laboratory in Edinburgh, with a value of £110 million in the final business plan. The results of our review, assessed against the criteria set out in paragraphs 1.2.21 to 1.2.27, are shown in Table 76.

*Table 76: Assessment summary of other project investment cases*

| Investment Code | Investment Name | RAG Score: Needs & Options | RAG Score: Regulatory Engagement | RAG Score: Cost Estimate | RAG Score: Benefits & Risk | RAG Score: Overall Assessment |
|---|---|---|---|---|---|---|
| 5363112528 | SR21 Juniper House Refurbishment | GREEN | GREEN | AMBER | GREEN | GREEN |

*Observations on the Juniper House project*

1.6.5. WICS has assessed the proposed investment in the new scientific services laboratory with a Green assessment score and, therefore, the investment is allowed. However, we have some reservations to note related to the evidence provided for benchmarking of costs. This is the reason for the Amber score for the Cost Estimation assessment.

1.6.6. In undertaking the review WICS issued two formal queries to Scottish Water:[81]

- The project investment appraisals included in the evidence pack for this project were not clear on the size, in terms of gross internal floor area (GIFA), that was required for the new laboratory building. In response, Scottish Water confirmed the required size is 9,536 square metres, an overall increase in 1,430 square metres on the existing building; and
- WICS requested some additional evidence related to benchmarking used to confirm selection of a modular building technique.

1.6.7. In response to our query, a benchmarking report, which is referenced in Appendix F of the Stage 4 investment group paper dated May 2025, was provided.[82] The report, prepared by external consultants, Gleeds, compares the cost of traditional construction with modular building construction and compares both construction methods with other projects of similar complexity.[83]

1.6.8. In comparing traditional build to modular build the GIFA of the modular build has been reduced to remove areas falling out of "GIFA parameters" but the basis for doing this is not explained. Without this reduction, the benchmark comparison for a modular building may not compare favourably with a traditional building.

1.6.9. In general, WICS considers that the benchmarking report lacks clarity regarding the logic used to benchmark the modular build proposal for the Juniper House project against both other projects and against traditional construction. For example:

- The source information and calculation of the square foot cost used in the report for Juniper House is not transparent; and
- The source information and calculation for the comparative building costs used in the benchmarking is not transparent.

1.6.10. In its conclusion, the benchmarking report states that "certainty around this [benchmarking results] can only be obtained and analysed with a well-defined Scope and Specification". Given the lack of detail and uncertainty evident in the 2025 benchmarking report, WICS

[81] WICS query references 09-04 and 09-05 issued 24/04/2026 with replies from Scottish Water dated 01/05/2026
[82] Scottish Water (2025) 'Investment Group Paper 5062790000 SR21 Juniper House Gate 70.4 Ext Appendix', May 2025.
[83] Gleeds (2025), 'Juniper House New Build Benchmarking Report Review CE007', February 2025.

requests that this exercise is revisited when the project specification and scope is developed further.

### Review of asset maintenance investment

1.6.11. Table 77 The list below presents the Management Approaches covering investment in both water and wastewater services, along with WICS' RAG assessment. The following paragraphs detail the assessment of each MA.

*Table 77: Management Approaches relating to both water and wastewater assets or to shared assets*

| MA number | MA Name | Value in SRC27 (2024-25 prices; £m; post-efficiency) | Primary Service | Proportion of value in SRC27 for water | Proportion of value in SRC27 for wastewater | Proportion of value in SRC27 for shared assets | WICS assessment |
|---|---|---|---|---|---|---|---|
| MA029 | Offices, Property and Estates | 66 | Shared Services | 9% | 9% | 81% | Red |
| MA066 | Digital | 107 | Shared Services | 0% | 0% | 100% | Green |
| MA071 | Logistics Vehicles | 131 | Shared Services | 0% | 0% | 100% | Green |
| MA091 | High Voltage Assets | 79 | Water + Wastewater | 42% | 58% | 0% | Amber |
| MA120 | Site Buildings and Asset Access | 96 | Water + Wastewater | 46% | 39% | 15% | Green |
| | **Total** | **480** | | | | | |

### *MA029 Offices, Property and Estates*

1.6.12. Management Approach 29 covers a wide variety of properties owned by Scottish Water, including offices, depots, farms, cottages, commercial properties, let houses, redundant assets (assets awaiting demolition) and various other properties. Each asset type has its own maintenance policy explained in the management approach.

1.6.13. Scottish Water is proposing to spend £66 million (2024-25 prices) on these assets over the 2027-33 regulatory period.

1.6.14. We have some concerns with the cost projections provided by Scottish Water. Most notably, the proposed spend on repair and refurbishment of office properties cannot be reconstructed using the proposed intervention rates and costs within the management approach. Even a conservative estimate of the unit costs is lower for both repair (18%) and refurbishment (48%). Deducting these costs from the expected expenditure within the MA, we find a potential 20% reduction, which we propose applying to Scottish Water's proposed investment. Table 78 below summarises our analysis.

*Table 78: MA029 cost challenge calculation*

| Office Repair and Replace Cost Challenge | Repair | Replace |
|---|---|---|
| Unit cost provided within management approach[84] | £44,000 | £1,065,000 |
| Derived unit costs[85] | £82,000 | £1,296,000 |
| Difference as a percentage (rounded) | -47% | -18% |
| Total cost of investment[86] | £27.6m | £40.5m |
| Cost challenge using the unit costs provided in the management approach | -£12.9m | -£7.2m |
| **Total Challenge Calculation** | **Combined** | |
| Total cost allocation with the MA | £100.1m | |
| Cost challenge for office repair and replacement | -£20.1m | |
| Difference as a % (rounded) | 20% | |

1.6.15. On this basis, we are proposing a cost challenge of £13 million (c.20% of Scottish Water's proposed spend in this area). Table 79 sets out our draft allowance in this area.

[84] Based on costs in MA029 Table 29 and Table 30 (cost of road inspection).
[85] Based on information in MA029 Table 68 and Table 86.
[86] Based on costs in MA029 Table 68.

*Table 79: Draft Determination allowance for MA029 Offices, Property and Estates*

| MA029 Offices, Property and Estates | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £66m |
| Cost challenge (2024-25 prices) | -£13m |
| Draft allowance (2024-25 prices) | £53m |
| Draft outputs to be delivered over 2027-33: Number of property asset interventions | 32 |

### *MA066 Digital*

1.6.16. Management Approach 66 covers the digital assets owned by Scottish Water. These are split into 10 digital areas: Data Centre Systems; Digital Workplace; Cloud Business Systems; Digital Channels; Integration and Automation; Cloud Platform; Cloud Products; Edge Compute & Sensing; Cyber Security; and Networks and Communications.

1.6.17. Each digital area (except Digital Workplace) will be proactively replaced at an early stage. An exception is made for the Digital Workplace area, where assets will be replaced later, once they are obsolete but prior to becoming non-functional.

1.6.18. Scottish Water is proposing to spend £107 million on these assets over the 2027-2033 regulatory period.

1.6.19. Whilst Scottish Water has not provided unit costs or expected run rates within each area, we understand that it is difficult to quantify digital solutions in this way due to interdependencies and uncertainties of requirements. Scottish Water has instead used a combination of historical benchmarks from comparable digital initiatives, expert judgement on scope and delivery complexity, and scenario-based modelling where costs are interdependent rather than unit-driven to estimate the expected costs for each area. We are satisfied that these estimates are reasonable.

1.6.20. Table 80 sets out our draft allowance in this area.

*Table 80: Draft Determination allowance for MA066 Digital*

| MA066 Digital | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £107m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £107m |
| Draft outputs to be delivered over 2027-33: Number of digital transformation interventions | 12 |

### *MA071 Logistics Vehicles*

1.6.21. Management Approach 71 covers the 2,658 vehicle assets owned by Scottish Water. These are split into 1,557 Light Commercial Vehicles (LCVs), 154 Heavy Goods Vehicles (HGVs), 147 HGV trailers, and 700 plant assets.

1.6.22. This management approach proposes that all Light Commercial Vehicles will be replaced by electric vehicles once they reach the point of not being economic to repair. HGVs will utilise Hydrotreated Vegetable Oil (HVO) fuel where possible. From 2030, Scottish Water will begin transitioning HGVs to electric.

1.6.23. Scottish Water is proposing to spend £131 million (2024-25 prices) on repairing and replacing these assets over the 2027-33 regulatory period.

1.6.24. The expected asset lifespans and replacement costs set out by Scottish Water within the final business plan are reasonable, potentially conservative, given the forecast number of interventions and costs in the management approach.

1.6.25. We therefore consider the costs to be reasonable in this area.

*Table 81: Draft Determination allowance for MA071 Logistics Vehicles*

| MA071 Logistics Vehicles | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £131m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £131m |
| Draft outputs to be delivered over 2027-33: Number of vehicle or plant item interventions | 2,131 |
| Draft outputs to be delivered over 2027-33: Number of alternative fuel refuelling infrastructure points | 690 |

### *MA091 High Voltage Assets*

1.6.26. Management Approach 91 proposes that high-voltage (HV) assets be inspected every 2 years and that those assessed as condition grade 4 (CG4) be scheduled for planned replacement. The management approach assumes that HV assets will be repaired up to the point of replacement.

1.6.27. The management approach covers the following high voltage (HV) assets:

- 43 HV pump motors, for which CG4 is assumed to correspond to 22 years;
- 87 HV switchgear, for which CG4 is assumed to correspond to 30 years; and
- 158 transformers, for which CG4 is assumed to correspond to 37 years.

1.6.28. Scottish Water proposes to spend £79 million (2024-25 prices) on maintaining these assets over the 2027-33 regulatory period.

1.6.29. Scottish Water's management approach clearly sets out its assumptions for the unit costs and the number of HV assets to be replaced. However, our assessment is that some key assumptions underpinning the management approach could be based on more comprehensive information.

1.6.30. Furthermore, the total investment proposed in Table X for the 2027-33 period is more than double that for the 2021-27 regulatory period. However, we recognise that the management approach notes a "significant backlog of assets requiring replacement" exists. The chosen option proposes 105 replacement interventions, which broadly align with the backlog of assets at CG4 (110) implied by condition-age tables 15-17.[87] This suggests that there may be limited capacity to maintain assets reaching CG4 during SRC27, resulting in a backlog being accumulated for SRC33. The management approach explains that "The current backlog will be addressed through the remainder of SR21 and across SR27. We have therefore smoothed the initial required investment across the first nine years of model outputs which covers the period until the end of SR27 and reflects the expected delivery."[88]

1.6.31. Recognising this backlog, we do not propose to reduce the 2027-33 investment to the level of investment in the 2021-27 period. However, we may review this further ahead of the Final Determination.

1.6.32. We also emphasise the need for improvements in the underpinning data, as acknowledged by the management approach.

1.6.33. Table 82 sets out our draft allowance in this area.

*Table 82: Draft Determination allowance for MA091 High Voltage Assets*

| MA091 High Voltage Assets | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £79m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £79m |
| Draft outputs to be delivered over 2027-33: Number of high voltage system interventions | 21 |

### *MA120 Site Buildings and Asset Access*

1.6.34. Management Approach 120 covers a range of asset types, including buildings, kiosks, fencing, access roads, road bridges, site grounds and abandoned assets. Scottish Water will

[87] This number is the sum of the condition grade 4 asset counts on pages 21-22 of MA091 based on age assumptions.
[88] Scottish Water (2025), 'Summary Management Approach High Voltage Assets Water and Wastewater MA091', March 2025, p.52.

take a variety of actions, including inspection, repair, refurbishment, replacement and demolition, as required for each different asset type.

1.6.35. Scottish Water is proposing spending £96 million (2024-25 prices) on these assets over the 2027-33 regulatory period.

1.6.36. The number of interventions and proposed unit costs provided within the management approach are explained by the policy choices and based on historical values for similar projects. We are satisfied that these are reasonable and proportionate.

1.6.37. Table 83 sets out our draft allowance in this area.

*Table 83: Draft Determination allowance for MA120 Site Buildings and Asset Access*

| MA120 Site Buildings and Asset Access | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £96m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £96m |
| Draft outputs to be delivered over 2027-33: Number of site buildings and asset access interventions | 95 |

### Benchmarking

1.6.38. Table 84 sets out the other investment areas subject to benchmarking and our assessment.

*Table 84: Assessment summary of other areas suitable for benchmarking*

| Area | Programme | Sub-area ("Investment Area") | Sub-area investment (2024-25 prices; £m) | WICS Assessment |
|---|---|---|---|---|
| Climate Mitigation | Process Emissions | Process Emissions | 15 | No cost challenge proposed |
| Climate Mitigation | Carbon Capture | Carbon Capture | 29 | Cost challenge proposed |
| Climate Mitigation | Pilot activities | Pilot activities | 16 | No cost challenge proposed |
| | | **Total** | **60** | |

*Process emissions*

1.6.39. For PR24, Ofwat allowed or disallowed individual wastewater process emissions schemes based on a three-phase assessment with the following criteria:

- Schemes should be driven by net zero and not related to other cost drivers;

- Schemes should support sector innovation and learning, and their impact clearly demonstrated through monitoring and reporting and forming part of a long-term net zero delivery strategy; and
- Unit costs should be reasonable, considering both PR24 in isolation and the whole asset lifetime.[89]

1.6.40. The £15 million of investment proposed in Scottish Water's final business plan relates to wastewater nitrous oxide process emissions and research and innovation, with methane and carbon dioxide emissions proposed to be addressed through research and innovation and funding for bioresources and Industrial Emissions Directive improvements.[90]

1.6.41. A simple unit cost comparison of Scottish Water's proposed investment and schemes accepted in England and Wales is shown in Table 85. When comparing Scottish Water's proposed investment to nitrous oxide schemes accepted for PR24 on a simple cost-per-tCO2e basis, Scottish Water's investment can be considered efficient. However, when compared with all accepted wastewater process emissions schemes, Scottish Water's costs are above average.

*Table 85: Unit cost comparison of Scottish Water's wastewater process emissions investment and wastewater process emissions investment accepted for PR24*

| Wastewater process emissions schemes | Cost per tCO2e (2024-25 prices) |
|---|---|
| Scottish Water – nitrous oxide pathway | £7,255 |
| England and Wales – accepted nitrous oxide schemes | £8,926 |
| England and Wales – all accepted schemes | £1,400 |

1.6.42. WICS recognises that nitrous oxide is a highly potent greenhouse gas with almost 300 times the global warming potential of carbon dioxide, which is difficult to capture once emitted and accounts for 69% of Scottish Water's process emissions.[91] As such, and given that Scottish Water's proposal is efficient compared to similar schemes in England and Wales, we consider that costs are reasonable in this area.

*Table 86: Our draft allowance for process emissions*

| Process emissions | Value |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £15m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £15m |

[89] Ofwat (2024), 'Wastewater – net zero; enhancement expenditure model', December 2024, available at: https://www.ofwat.gov.uk/wp-content/uploads/2024/12/PR24-FD-CA88-Wastewater-net-zero-enhancement-expenditure-model.xlsm

[90] Scottish Water (2026), 'Business Plan 2027-2033 Technical Appendices – Climate Change Mitigation', 26 February 2026, pp. 33-34.

[91] Scottish Water (2026), 'SR27 Evidence Base – Evidence Pack – Process Emissions', 26 February 2026, p. 4.

| | |
|---|---|
| Draft outputs to be delivered over 2027-33: Reduction in emissions | 2,000 tCO2e |

*Carbon capture*

1.6.43. Scottish Water is proposing £29 million of expenditure in this area. We compared this proposed expenditure with Scottish Water's previous investments, expressed in terms of £ per hectare of land established or supported for carbon capture. This comparison indicates that Scottish Water's historic expenditure is around 68% lower than its business plan proposal on a £ per hectare basis. We have also compared Scottish Water's projects to similar projects undertaken by companies in England and Wales. These comparisons indicate that expenditure of companies in England and Wales is 27% lower than Scottish Water's proposed expenditure. Based on the comparisons, we consider a 27% cost challenge appropriate, which is the lower of the two estimates. Table 87 sets out our proposed cost challenge in this area.

*Table 87: Our draft allowance for carbon capture*

| Carbon capture | Value |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £29m |
| Cost challenge (2024-25 prices) | -£8m |
| Draft allowance (2024-25 prices) | £21m |
| Draft outputs to be delivered over 2027-33: Area of carbon capture sites established or supported | 2,000 ha |

1.6.44. We note that there is one carbon capture project (We Enhance Scotland's Environment 03 – Carbon Capture – Woodland Creation) appearing to have an unrealistic low cost per hectare in SRC27, which we suspect is due to an error in the population of Table X. Correcting for this would result in a greater cost challenge for carbon capture.

*Pilot activities (Alternative fuelled vehicles and refuelling infrastructure)*

1.6.45. Ofwat's models for this area calculate costs based on emissions reductions, which is not shown in the data submitted by Scottish Water. Given this incompatibility, we have benchmarked proposed investment in this area against historic expenditure in Annual Return submissions. On this basis, Scottish Water's proposals are in line with previous expenditure, and WICS considers that Scottish Water's proposed investment, as shown in Table 88, is reasonable.

*Table 88: Our draft allowance for pilot activities (alternative fuelled vehicles and refuelling infrastructure)*

| Pilot activities (alternative fuelled vehicles and refuelling infrastructure) | Values |
|---|---|
| Scottish Water forecast expenditure (2024-25 prices) | £16m |
| Cost challenge (2024-25 prices) | £0 |
| Draft allowance (2024-25 prices) | £16m |

| | |
|---|---|
| Draft outputs to be delivered over 2027-33: Number of alternative fuel refuelling infrastructure points | 690 |

### Conclusion of review of investment related to other areas

1.6.46. Table 89 below summarises WICS' draft allowance for each investment programme within the areas for climate change adaptation and mitigation, customer and communities, digital, transformation & innovation, and support services following our review as explained in this section. As explained in Chapter 5 of the Draft Determination, we also apply a further efficiency productivity challenge to this allowance which is not captured in the table below.

1.6.47. Table 90 and Table 91 below outline the relevant enhancement and asset maintenance outputs respectively for the areas for climate change adaptation and mitigation, customer and communities, digital, transformation & innovation, and support services which we expect to be delivered for the allowed investment.

*Table 89: Draft Determination allowance for other investment*[92]

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA006 - Climate Adaptation | Enhancement to Scotland's natural capital | 7 | 7 | |
| TA006 - Climate Adaptation | Increase biodiversity beyond statutory levels | 5 | 5 | |
| TA006 - Climate Adaptation | Understand the implications of climate change and risks to service resilience | 2 | 2 | |
| TA007 - Climate Mitigation | Process Emissions | 15 | 15 | |
| TA007 - Climate Mitigation | Carbon Capture | 29 | 21 | Cost challenge on the programme for carbon capture (-£8 million). |
| TA007 - Climate Mitigation | Pilot activities | 16 | 16 | |
| TA015 - Customer and Communities | Customer Research | 2 | 2 | |
| TA015 - Customer and Communities | Priority Service Register Improvements | 4 | 4 | |
| TA015 - Customer and Communities | Digital Developments for Customer Experience enhancements | 5 | 5 | |
| TA015 - Customer and Communities | Access to assets | 6 | 6 | |

[92] WICS' draft allowance in this table is before applying an additional productivity efficiency challenge. Please refer to Chapter 5 of the Draft Determination for more details on this further adjustment.

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA015 - Customer and Communities | Campaigns & marketing | 4 | 4 | |
| TA017 - Digital | Efficient planning & delivery | 17 | 17 | |
| TA017 - Digital | Risk and Security | 46 | 46 | |
| TA017 - Digital | Commodities & Infrastructure | 44 | 44 | |
| TA017 - Digital | Intelligent Decision Making | 1 | 1 | |
| TA018 - Transformation & Innovation | Enable Innovation | 23 | 23 | |
| TA018 - Transformation & Innovation | Lighthouse projects | 5 | 5 | |
| TA018 - Transformation & Innovation | Research and Hydro Nation | 4 | 4 | |
| Support Services | Juniper House | 110 | 110 | |
| Support Services | Maintain existing fleet | 115 | 115 | |
| Support Services | Maintain existing offices and estates | 66 | 53 | Cost challenge on the programme for maintaining offices and estates (-£13 million). |
| Support Services | Maintain existing renewable energy | 18 | 18 | |
| Support Services | Maintain scientific equipment | 7 | 7 | |
| | **Total** | **549** | **528** | |

*Table 90: Enhancement outputs to be delivered with Draft Determination allowance for other investment*

| Table 2 ref. | Output category | Unit | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 | Total |
|---|---|---|---|---|---|---|---|---|---|
| **T2.17** | Area of carbon capture sites established or supported | Hectares | 237 | 324 | 642 | 339 | 170 | 288 | **2,000** |
| **T2.25** | Number of sites enabled for community access | Number | 1 | - | - | - | - | - | **1** |
| **T2.33** | Number of climate change audits and studies | Number | - | - | - | - | - | 1 | **1** |
| **T2.39** | Area subject to interventions to improve biodiversity | Hectares | 750 | 750 | 750 | 750 | 750 | 750 | **4,500** |
| **T2.57** | Reduction in emissions | tCO2e | - | - | - | 500 | 500 | 1,000 | **2,000** |
| **T2.58** | Number of scientific services facilities upgraded | Number | - | - | 2 | - | - | - | **2** |
| **T2.58** | Number of demonstrators / catchment trials deployed | Number | - | - | - | - | - | 3 | **3** |
| **T2.58** | Number of innovation pilot programmes undertaken | Number | 11 | 11 | 12 | 13 | 14 | 15 | **76** |
| **T2.58** | Number of Hydro Nation ideas put into practice | Number | - | - | - | - | - | 1 | **1** |
| **T2.58** | Number of process improvements to support improved response to priority service customers | Number | 1 | - | - | - | - | - | **1** |
| **T2.58** | Number of Campaigns and marketing initiatives | Number | 3 | 4 | 4 | 4 | 4 | 5 | **24** |
| **T2.58** | Number of plans to improve customer experience | Number | 1 | - | - | - | - | - | **1** |
| **T2.58** | Number of Lighthouse projects delivered | Number | 1 | - | 1 | - | - | - | **2** |

*Table 91: Replacement, repair and refurbishment outputs to be delivered*

| Primary output | Unit | Total |
|---|---|---|
| Number of vehicle or plant item interventions | Number | 2,131 |
| Number of scientific equipment instruments replaced | Number | 229 |
| Number of renewable energy asset interventions | Number | 1,691 |
| Number of property asset interventions | Number | 32 |
| Number of alternative fuel refuelling infrastructure points | Number | 690 |
| Number of digital transformation interventions | Number | 12 |

## 1.7. Review of Scottish Water's evidence on overall investment efficiency

1.7.1. This section covers Scottish Water's analysis on the efficiency of its direct and indirect capital costs along with our assessment of that analysis.

1.7.2. Our draft decision relating to direct cost is that we broadly accept Scottish Water's analysis in this area. We considered applying a c.£14 million cost challenge on direct costs for Civils assets, however we recognise that we are proposing to apply a cost challenge to some Management Approaches which cover lines for Civils investment in the final business plan data tables. While we have decided not to apply a cost challenge in this area, we will be expecting Scottish Water to provide additional evidence as and when requested to demonstrate its direct costs remain broadly efficient.

1.7.3. Our draft decision relating to indirect costs is that we consider that Scottish Water's indirect costs are broadly in line with comparators from England and Wales. We considered applying a cost challenge of around £10 million – this would aim to strike a balance between the view that Scottish Water's indirect costs are at a similar level to those of industry comparators and the recognition that the benchmarking analysis could be further improved. While WICS could set an additional efficiency challenge in this area, WICS' draft decision is not to set a further challenge in this area. This judgement recognises that WICS is also setting a 1% frontier-shift efficiency challenge on capital expenditure, which is higher than the level proposed in Scottish Water's business plan, as explained in Chapter 5 of the main Draft Determination document. WICS will consider this further for the final determination.

### Direct costs

1.7.4. Direct investment costs (as opposed to indirect costs) are costs related to construction labour, plant or materials. Scottish Water explains in its final business plan submission that its direct investment costs make up approximately 60% of its investment plan for SRC27.[93]

[93] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.13.

1.7.5. This sub-section covers:

- Scottish Water's evidence and analysis provided in the final business plan; and
- Our assessment of the final business plan evidence.

*Scottish Water's catch-up efficiency proposals in the final business plan for direct costs*

1.7.6. Scottish Water proposes no catch-up efficiency challenge is applied on its direct investment costs in SRC27. This is based on analysis by an external consultant who benchmarked Scottish Water's direct cost curves[94] to a cost base with data from England and Wales, a peer review report by First Economics on the approach and results of the efficiency analysis of capital and operating expenditure, and on further analysis by Scottish Water, as explained in technical appendix 12 'Efficiency'. Scottish Water acknowledges that further analysis is required in some specific areas such as civils and wastewater infrastructure to determine why those costs appear materially higher than industry benchmarks. The final business plan technical appendix also seeks to address some of the detailed feedback WICS issued to Scottish Water in its efficiency feedback letter in March 2025 and following the draft business plan submission.

1.7.7. Scottish Water explains that its direct cost models have been used to estimate the costs of around 25% of its SRC27 investment plan and are typically used in costing projects in early stages of development. Its benchmarking analysis shows Scottish Water's cost curves appear to be -4.2% lower (more efficient) compared to the industry average, and +16.5% higher (less efficient) than the industry upper quartile, i.e. the most efficient 25% of companies. However, there is a wide range of variance in the relative efficiency of the constituent categories making up that overall total as shown in Table 92.

*Table 92: Benchmarking results of Scottish Water's direct cost curves by category*

| Category | Variance to industry average benchmark | Variance to industry upper quartile benchmark |
|---|---|---|
| Civils | 11.5% | 37.7% |
| MEICA | -0.9% | 22.3% |
| Distribution (mains) | -22.7% | -8.5% |
| Trunk (mains) | -0.4% | 19.0% |
| Cess and Septic Tanks | -22.5% | -2.8% |
| **Total** | **-4.2%** | **16.5%** |

[94] Cost curves or cost models are algebraic equations derived from historic data and used to estimate the cost of a process component based on a given yardstick (unit for the comparison such as $m^3$ or ML/d). Each cost model is an equation representing the best fit regression line obtained from each process component dataset of Yardstick Values and Costs.

1.7.8. Scottish Water explains that costs for wastewater infrastructure assets (i.e. sewers) are not included in the overall efficiency comparison above as sewers have asset lives over 100 years and Scottish Water assumes they will be repaired and refurbished in perpetuity, but not fully replaced.[95] The initial benchmark analysis (which looked at the 3 categories of non-infrastructure assets, water infrastructure assets and wastewater infrastructure assets, rather than the 5 categories in Table 92) showed that the cost curves for wastewater infrastructure assets were the only category with higher costs than the industry average (+41.0%) and the upper quartile (+74.3%).[96] While this initial analysis was later updated to exclude cost curves for sewers, Scottish Water has committed to further investigate the reasons for this cost difference compared to the industry.

1.7.9. Following our feedback to the initial efficiency assessment in February 2025 and the draft business plan, Scottish Water has further analysed the possible reasons for the apparent high civils costs, such as the fewer data points for civils and, in particular, the 'Highlands and Islands' impact.[97]

1.7.10. Scottish Water also undertook additional analysis as per its efficiency plan to compare the output of its cost curves to its actual outturn costs from past projects delivered before SRC21. It found that the actual historic costs were 3.65% lower than the cost models predicted. This supports Scottish Water's assessment that the cost models are in line with historical project pricing (also accounting for inflation).[98]

1.7.11. Scottish Water explains it has used 2 other methodologies for costing investment in the final business plan, besides the direct cost models: using run rate costs and using its Benchmark Estimating Software (BES) system. Run-rate costs are used to price around 34% of the investment plan, typically applied to less-complex construction costs. Scottish Water explains these costs are estimated by extrapolating from recent projects or programmes of similar scope and by market-testing through procurement activities. They are considered more up-to-date cost rates than those included in the direct cost curves and are more liable to vary with market conditions. BES has been used to cost around 8% of the SRC27 investment programme. The software contains the current framework rates from Scottish Water's procured providers and provides granular costings for projects in later stages of development, thus updating the cost estimates from the High-Level Pricing Tool, which uses the direct cost curves.

1.7.12. Scottish Water has included a further efficiency adjustment of 2.25% applied to the costs derived from cost curves over the period. This is because the cost curves are based on

[95] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.15.
[96] ChandlerKBS (2025), 'R2309 Cost Model Assurance & Benchmarking', 7 February 2025, p.2. Submitted with the final business plan.
[97] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.21.
[98] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.25.

outturn project costs from SR10 and SR15 (indexed for inflation) and, as such, do not account for efficiency improvements expected to be achieved by the end of the SRC21 period.

*WICS' assessment of evidence*

1.7.13. This subsection considers our previous feedback, namely our concerns over benchmark results for civils and wastewater infrastructure models, the appropriate industry benchmark (median versus upper quartile), and the benchmarking methodology. We also examine the assumptions behind the 2.25% adjustment for expected SRC21 efficiency gains. Each of these is explored in turn.

1.7.14. On the direct costs models for wastewater infrastructure assets, Scottish Water has explained that these are not included in the final benchmarking analysis, which is based on its Level 0 models (see paragraph 1.7.8). The initial analysis (which included the sewer models) focused on the direct cost models, which were used in Scottish Water's MEAV[99] database where sewers comprise c.65%[100] of the total MEAV of all of Scottish Water's assets. As such, we considered that the costs for this asset category and the apparent high inefficiency compared to the industry benchmark (+41% higher than industry average) could have a material impact on Scottish Water's overall efficiency position.

1.7.15. However, Scottish Water explains that updating the benchmarking analysis to align with Level 0 models (and thus exclude the sewer cost models) was intended to better reflect the composition of the SRC27 investment plan.[101] This appears to be the case, as the programme for maintaining critical and non-critical sewers is £295 million over SRC27, or 3.6% of the proposed investment plan (this does not include replacement, but mainly repair and some refurbishment). Furthermore, Scottish Water explains in technical appendix 12 that it estimates that only about £45 million of the SRC27 investment plan has been calculated using these higher-cost wastewater infrastructure cost models.

1.7.16. Our engineering consultants reviewed the programme for maintaining sewers and consider that it would not be directly comparable to the wastewater infrastructure direct costs benchmarked by ChandlerKBS. This is because the programme consists largely of reactive (not planned) interventions specifically for gravity sewers, while the direct cost curves would be based on planned historic projects for a variety of wastewater infrastructure assets (including new sewers, pumped rising mains, storage tanks, combined sewer overflows).

[99] MEAV stands for Modern Equivalent Asset Value. It represents the equivalent replacement cost of the asset and should reflect both the most technically up-to-date new asset and the most technically up-to-date method of constructing that asset.
[100] Based on Gross MEAV values in Annual Return 2024-25 Tables H1 and H4 (line H4.1 Sewers). This excludes pumping mains. The Gross MEAV in the Annual Return H tables includes both direct costs and estimated indirect costs.
[101] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.18.

1.7.17. Based on the level of materiality and the findings from our engineering review, we consider that no further cost challenge is required for this programme.

1.7.18. With regards to civils cost models and their variance of 11.5% above the industry average benchmark (and 37.7% above industry upper quartile), we note Scottish Water's additional evidence on the 'Highlands & Islands' factor and Scottish Water's estimation that civils cost models have been used to cost only around £143 million (1.8%) of the SRC27 investment in the final business plan. We considered applying a 10% general challenge on expenditure on Civils based on a conservative view of the variance to the industry average benchmark (amounting to c.£14 million of the £143 million). However, we are also aware that the investment lines in Table X, which we can see relate to replacement of Civil assets are also in large part covered by our various approaches for reviewing the investment plan – in particular, our internal and external engineering reviews and the review of Management Approaches. Several of the Management Approaches we have reviewed cover investment lines related to replacing Civils including MA029 'Offices, Property and Estates' where we propose applying a £13 million cost challenge (see paragraph 1.6.15). Based on this, we consider it is reasonable not to apply a further challenge on investment on Civils.

1.7.19. Regarding which industry benchmark is more appropriate – the average or the upper quartile, we note that Scottish Water has not provided any further evidence compared to the draft business plan to support its proposal to use the average over the more challenging upper quartile benchmark. Scottish Water explains in technical appendix 12 that Ofwat has found issues with assessing efficiency at the company level (rather than project level) and that it "generally sets the benchmark based on the efficiency of the median company".[102] The First Economics peer review report (submitted first with the draft business plan) also supports using the industry median/average rather than the upper quartile.[103] However, we note that Ofwat also "apply a more stringent upper-quartile efficiency challenge when [Ofwat] consider a median efficiency challenge is insufficiently stretching".[104] As such, we have decided that the average industry benchmark would be appropriate in most cases unless there is evidence that it is not sufficiently stretching.

1.7.20. Regarding Scottish Water providing further detail on the methodology used for the direct cost benchmarking, we note that Scottish Water has provided some additional clarifications following our feedback from March 2025.

1.7.21. Regarding Scottish Water's proposed 2.25% efficiency adjustment to account for expected SRC21 efficiency gains, we consider that Scottish Water's approach appears reasonable and we agree with this being applied. We do note that the adjustment is based on a 50/50

[102] Ofwat (2024), 'PR24 final determinations: Expenditure allowances – enhancement cost modelling appendix', 19 December 2024, p.27.
[103] First Economics (2025), 'SR27 Benchmarking: Peer Review', 14 March 2025, p.3.
[104] Ofwat (2024), 'PR24 final determinations: Expenditure allowances – enhancement cost modelling appendix', 19 December 2024, p.28.

assumed split of investment priced through direct cost curves and through run rates; however, Scottish Water recognises that this assumption is not correct for the updated final business plan investment.[105]

### Indirect costs ('pound in the ground' analysis)

1.7.22. Indirect investment costs relate to expenditure which is not related to construction labour, plant or materials, which are all direct costs. Indirect costs include activities such as design, project and programme management, construction management, site preliminary costs and management fees. Scottish Water explains in its final business plan submission that its indirect investment costs make up approximately 40% of its investment plan for SRC27.[106]

1.7.23. Scottish Water proposes that no catch-up efficiency challenge is applied to its indirect costs in SRC27. This is based on analysis in 3 consultant reports provided in the final business plan submission, which benchmark Scottish Water's indirect costs to those of companies in England and Wales. The results are summarised in technical appendix 12.

1.7.24. We highlighted in our final methodology for SRC27 that we would require external technical expertise in engineering and asset management to review Scottish Water's investment programme, including specific areas of asset management that apply across the investment programme, such as Scottish Water's approach to overheads and risk allowances. We commissioned engineering consultants WSP to undertake this review on our behalf.

1.7.25. One of the metrics Scottish Water used to benchmark its indirect and on-cost levels[107] against those of comparator companies relates to 'pound in the ground' analysis, which measures indirect costs as a proportion of total direct construction costs. We asked WSP to review whether Scottish Water's benchmarking approach is robust and in line with the data and evidence available to the consultant.

1.7.26. WSP considers that Scottish Water's benchmarking of indirect costs has an appropriate approach at a high level but lacks robustness and transparency in cost categorisation, risk exclusion, and statistical significance at a more detailed level. Scottish Water's client on-costs are significantly above industry norms, while its contractors' on-costs are lower. This could likely be attributed to differing delivery models, comparator sets, and data confidence levels. Overall, WSP assigned a medium level of confidence to Scottish Water's benchmarking and considers that, in aggregate, Scottish Water's indirect costs are broadly

[105] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.33.
[106] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.28.
[107] On-costs are interchangeably used with indirect costs to refer to the indirect costs associated with delivering a capital project, typically split into two categories:
- Client On-Costs: Costs incurred by the client organisation (in this case, Scottish Water), such as project management, design, governance, stakeholder engagement, and internal overheads.
- Contractor On-Costs: Costs incurred by the contractor that are not part of direct construction, including site preliminaries, supervision, and contractor-side project management.

comparable with industry overall. However, there are variances between Scottish Water's costs and the average industry costs for several constituent categories, leading WSP to identify a potential cost challenge of £8 million to £26 million.

1.7.27. In its final business plan, Scottish Water has provided feedback on the WSP findings.[108] The main points are examined in turn below.

1.7.28. Regarding cost categorisation, WSP noted there is alignment in the analysis of high-level cost categories but less so in how subcategories are defined and applied. Greater clarity and consistency in the cost taxonomy are needed to avoid misclassification – such as treating land as an indirect rather than a direct cost – and to ensure meaningful benchmarking across datasets. In response to this, Scottish Water agreed this would improve the benchmarking; however, it noted that the cost categorisation by other companies is not uniform nor under Scottish Water's control. Scottish Water has accounted for this by working with the higher-level cost categories, which it considers should be adequate.

1.7.29. Regarding risk exclusion, WSP noted that Scottish Water's risk costs were excluded from the analysis, even though these costs can make up a substantial share of indirect costs for some projects. It also observed that the method for removing risk from the comparison datasets was not clearly defined. While WSP suggested that incorporating risk costs could strengthen the analysis, it acknowledged that organisations treat risk provisions within on-costs differently, making comparisons more complex. Overall, WSP recommended that the analysis explicitly addresses the role of risk costs, either by ensuring they are consistently included across datasets or by benchmarking them separately as a distinct cost category.

1.7.30. In response to this, Scottish Water clarified that risk costs were deliberately excluded from the analysis to simplify the methodology (it is unknown how compactor companies allocate risk cost and thus how to do a meaningful comparison with Scottish Water) and because adding risk costs to the analysis would likely require their proportionate allocation between direct and indirect costs and thus have a minimal impact on the relative efficiency results.

1.7.31. Regarding statistical significance, WSP noted that while the indirect benchmarking reports use averages, medians, quartiles, and weighting for data characteristics and confidence, they do not use inferential statistical methods (e.g., Student's t-distribution) to test whether differences between Scottish Water and comparators are statistically significant. In response, Scottish Water explained that its consultants have used a range of industry-standard methodologies, but it will consider WSP's advice in future benchmarking exercises.

1.7.32. Regarding the split of client versus contractor on-costs, WSP noted that Scottish Water's delivery model consistently shows a reversed cost profile compared to industry norms (with higher client on-costs and lower contractor on-costs), reflecting a strategic choice to perform

[108] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, pp.30-32.

more design and management activities in-house rather than outsourcing to contractors. WSP also noted that the implementation of DV4 may potentially have an impact on the cost elements by shifting more on-cost to the contractors for early stage planning, but also increase client on-costs for Scottish Water for programme management and stakeholder engagement.

1.7.33. In response, Scottish Water agrees that its delivery model impacts the split of client versus contractor on-costs which is why its analysis focuses on the total on-costs instead. For example, it is aware that it is currently allocating almost all early project development costs as client on-costs, whereas other large water companies that have adopted an alliancing approach to programme delivery may allocate many of the same costs as contractor on-costs.

1.7.34. However, Scottish Water suggests that WSP's findings in this area "directly clash" with the overall assessment for a cost challenge between £8 million and £26 million.[109] Scottish Water considers this conflation of client vs contractor on-cost allocations and efficiency when compared with benchmark companies to be at the core of WSP's concerns, which creates an inconsistency with WSP's assessment that Scottish Water maintains strong cost efficiency across all project types and sizes.

1.7.35. We do not agree that WSP's observations on Scottish Water's delivery model and client vs contractor on-costs split contradict its recommendation for an £8-26 million cost challenge as the challenge is derived from a benchmark of the total indirect costs based on WSP's experience – it is not derived from differences to benchmarks specifically for client or contractor on-cost elements.

1.7.36. Considering the evidence in the round, WICS takes the view that Scottish Water's indirect costs are broadly in line with comparators from England and Wales. We have considered applying a cost challenge on the lower end of the range proposed by WSP – this would aim to strike a balance between the view that Scottish Water's indirect costs are at a similar level to those of industry comparators and the recognition that the 'pound in the ground' analysis could be further improved, given the areas highlighted by WSP. While WICS could set an additional efficiency challenge in this area, the WICS draft decision does not set a further challenge in this area. This judgement recognises that WICS is also setting a 1% frontier-shift efficiency challenge on capital expenditure, which is higher than the level proposed in Scottish Water's business plan, as explained in Chapter 5 of the main Draft Determination document. WICS will consider this further for the final determination.

[109] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, p.32.

## 1.8. Review of the deliverability of the proposed investment programme

1.8.1. This appendix has so far examined different aspects of the investment programme separately. We also consider it important to assess the programme's overall size and the risks associated with delivering it.

1.8.2. This section first outlines what we outlined in our Final Methodology and introduces the analysis undertaken by consultants on our behalf in this area before then explaining the scope of the review, the summary of conclusions, developments since the report and the additional evidence presented in the final business plan. The section concludes by explaining how this evidence has been used to inform the Draft Determination.

### Background

1.8.3. Our Final Methodology explained that there are internal and external factors which impact the level of investment that Scottish Water could deliver efficiently over the 2027-33 regulatory period.[110] For example, a small investment programme may mean that Scottish Water cannot secure the benefits of scale in capital procurement and delivery. Conversely, a large investment programme beyond a specific size may become unmanageable given Scottish Water's internal capacity for asset management planning and delivery or the capacity of the supply chain.

1.8.4. The supply chain capacity covers the availability of materials, equipment, labour and delivery partners. As such, it would be impacted by the demand expected from several other infrastructure companies in the UK, which are increasing the size of their investment programmes. For example, Ofwat's final determinations for PR24 allowed an increase in enhancement investment for water and wastewater companies in England and Wales of around 4 times to around £44 billion over 2025-30 compared to the allowances for the 2020-25 period. [111] By the time the SRC27 regulatory period starts in Scotland, the water and sewerage companies in England and Wales will be two years into delivering their five-year investment programmes for Asset Management Period 8 (AMP8). This means that the companies and their supply chains will be well underway with delivery in England and Wales, which may have a consequential impact on the availability of resources to Scottish Water.

1.8.5. Scottish Water has itself reported during the current SRC21 regulatory period that both Scottish Water and its delivery partners are experiencing losses of key resources to other sectors (mostly the energy sector) that offer more attractive reward packages. It has also been observed that some specialist suppliers (e.g., for Motor Control Centres, Site

[110] WICS (2024), 'Strategic Review of Charges 2027-2033: Final Methodology', 12 December 2024, p. 125.
[111] Ofwat (2024), 'PR24 final determinations: Expenditure allowances', republished 20 December 2025, p. 5.

Investigation, and Chemical Dosing) are being affected by the ramp-up in tendering activity associated with AMP8 in England and Wales.

1.8.6. These concerns are also recognised within the SRC27 Commissioning letter, which explained that "Average annual expenditure on the investment programme should remain of a size that allows efficient delivery whilst facing up properly to the challenges the industry and the wider supply chain faces".[112]

1.8.7. As such, WICS commissioned external consultants Turner & Townsend to undertake an analysis to understand a top-down view of the size of the investment programme that Scottish Water could deliver efficiently in the 2027-33 period, recognising the capacity of the supply chain and Scottish Water's own capacity to deliver the investment programme.

### Scope of review

1.8.8. The analysis by Turner & Townsend was intended to build on Scottish Water's existing research and scenario analysis on supply chain capacity and its impact on the deliverability of Scottish Water's proposed investment programme over the 2027-33 period.

1.8.9. Scottish Water presented an initial assessment of supply chain capacity for the 2027-33 period to stakeholders in October 2024. It recognised the significant investment in national infrastructure planned for the coming years in water, energy, transport and other sectors, both in the UK as a whole and specifically in Scotland. Scottish Water's assessment at that time showed it had high confidence in delivering a 25% uplift in investment (about £8 billion in total investment; 2023-24 price base), and medium/low confidence in delivering a 40% uplift (about £9 billion in total investment; 2023-24 price base). The latter scenario depended on some level of cost premiums being paid to secure supply chain capacity. Scottish Water estimated that an investment programme of over £9 billion would require significant cost premiums to secure capacity. Scottish Water then introduced the Enterprise Model for investment delivery to address these supply chain capacity concerns and promote innovation and efficiencies.[113] This new delivery vehicle is further explored later in this section.

1.8.10. To build on Scottish Water's analysis, WICS asked Turner & Townsend to examine both the internal and external constraints to the size of the investment plan Scottish Water can deliver efficiently. This included assessing:

- How well Scottish Water has managed the growth and delivery of its SRC investment programme as well as how well England and Wales water companies have managed their performance and increases in investment plans;

[112] Scottish Government (2024), 'Commissioning the Strategic Review of Water Charges: 2027-2033', 12 June 2024, p. 3.
[113] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 011 – Supply Chain', 26 February 2026.

- Scottish Water's SRC27 proposed delivery framework;
- The supply chain capacity at a macro level in Great Britain and in Scotland including upcoming infrastructure investments in the England and Wales water sector and the Great Britain energy sector which would draw on similar resources;
- The potential cost premiums Scottish Water might pay due to having a larger investment plan; and
- The key deliverability risks for SRC27.

1.8.11. The project was expected to last from April to July 2025.

### Project development

1.8.12. Once the project began in April 2025, WICS held a meeting with both the consultants and Scottish Water to discuss Scottish Water's initial assessment from October 2024 and any developments since then. At the meeting, Scottish Water explained that it had medium-level confidence that it can deliver a £9 billion investment programme (2023-24 price base). Scottish Water also clarified that the initial assessment from October 2024 was not based on an analytical model or calculations but instead on Scottish Water's judgement based on various market factors such as the current and expected future capacity of delivery partners and the associated size of investment they can deliver.

1.8.13. While Scottish Water shared some data on the current capacity of its supply chain, WICS and Turner & Townsend considered that this was not sufficient to do a detailed analysis for future capacity. Scottish Water informed us that its procurement process for appointing partners for its new delivery vehicle for the SRC27 period will have a major milestone in mid-August 2025, when bidders were asked to submit detailed capacity forecasts as part of their bids. As such, WICS and Turner & Townsend agreed to extend the project timelines – this allowed the consultants to analyse information from Scottish Water's draft business plan, the anonymised data submissions from the bidders in its procurement process, as well as data from the performance reports and delivery plans of water companies in England and Wales.

1.8.14. Scottish Water shared the anonymised bidders' responses from their August 2025 submission with WICS and Turner & Townsend. Over September and October 2025 Scottish Water held workshops with us and the consultants to discuss questions arising from the August submission and it subsequently provided further written answers and additional data. Turner & Townsend's report was based on the available evidence up to this point.

### Summary of findings and recommendations

1.8.15. Based on an in-the-round assessment using a mix of objective, subjective and anecdotal evidence, Turner & Townsend made the following overall conclusions outlined in Table 93.

*Table 93: Estimated range of investment Scottish Water can deliver efficiently in 2027-33*

| Range and confidence (2024-25 prices) | Reasoning |
|---|---|
| **£6.1 billion investment programme (£6 billion in 2023-24 prices)**<br><br>Higher level of confidence that Scottish Water can deliver efficiently | • Similar in size to the SRC21 programme<br>• Scottish Water's updated delivery model should mitigate the recurrence of the SRC21 under-delivery risks<br>• Maintaining this size will enable Scottish Water to focus on embedding its new delivery model and more effectively mitigating the associated risks<br>• Evidence from England & Wales suggests even limited increases can create challenges |
| **£7.2 billion investment programme (£7 billion in 2023-24 prices)**<br><br>Medium level of confidence that Scottish Water can deliver efficiently | • 15% uplift on the SRC21 programme<br>• Delivering this uplift in parallel with implementing and maturing a new delivery model adds more complexity, time and risk to delivery from a cost, schedule and quality perspective<br>• Delivering this uplift relies on some assumptions for Scottish Water's new delivery model and its capacity to grow to hold true |
| **£8.2 billion investment programme (£8 billion in 2023-24 prices)**<br><br>Lower level of confidence that Scottish Water can deliver efficiently | • 30% uplift on the SRC21 programme<br>• In addition to the points for the medium level of confidence, despite Scottish Water's early engagement on its new delivery model and its mitigations, analysis based on the supply chain's own capacity estimates suggest a potential shortfall towards the end of the period even with several stretching assumptions all holding true |

1.8.16. The following paragraphs explain some of the findings from Turner & Townsend's analysis, which support the overall conclusions and the confidence levels.

1.8.17. With respect to the delivery performance of the SRC21 investment programme (which was around 30% bigger than the SRC15 programme), the consultants observed that Scottish Water has been broadly on track with delivery once projects are developed and confirmed for delivery with the supply chain and is over-delivering on some outputs compared to the performance baseline provided in June 2024 to WICS. However, there is a risk that several high-risk/high-value outputs will be under-delivered, and several projects from the SRC15 programme remain outstanding (though this is recognised as partially due to impacts from the Covid-19 pandemic).

1.8.18. With respect to delivering the proposed SRC27 programme from the draft business plan (£8.3 billion in 2023-24 prices; around a 35% uplift over the SRC21 programme), Turner & Townsend analysed the available information on the new delivery framework, the Enterprise Model or Delivery Vehicle 4 (DV4). The new framework aims for collaborative delivery; however, it will also bring delivery risks due to its scale, transition and maturity. The capacity forecast analysis, which Scottish Water provided together with the anonymised bidder data, also appeared to be based on several implicit assumptions which would need to hold true for Scottish Water to have sufficient delivery capacity for the period as outlined below:

- **Assumption 1**: There is no double-counting of capacity if a supplier is on more than one delivery vehicle. Turner & Townsend had medium confidence that this assumption would hold true – despite Scottish Water's mitigations, the consultant could not rule out with certainty that double counting had occurred.
- **Assumption 2**: There is no optimism bias for DV4, recognising that the capacity for DV4 is based on the bidder's business plans as part of DV4. Turner & Townsend had limited confidence that this assumption would hold true – there is a risk that bidders' responses are driven by the perceived need to meet a threshold implied in the question.
- **Assumption 3**: Scottish Water can extend an existing alternative delivery vehicle (DV2) for two further 3-year terms (2027-33 and 2030-33), which is essential in ensuring that there is a baseload of capacity available while Scottish Water sets up the new enterprise model for DV4. Turner & Townsend had medium to high confidence that this assumption would hold true – Scottish Water was in the process of extending the contracts.
- **Assumption 4**: Capacity of the delivery vehicle specific for large projects (DV3) and capacity of Scottish Water's in-house delivery will flex to meet demand (i.e. there is a 1:1 relationship and demand for these DVs). Turner & Townsend had medium confidence that this assumption would hold true.
- **Assumption 5**: Scottish Water can substitute work between Delivery Vehicles, recognising that the overall assessment implicitly assumes that Scottish Water can utilise the surplus capacity in DV2 to compensate for the forecast shortfall in capacity in DV4. Turner & Townsend had limited confidence that this assumption would hold true, given the uncertainties of successful suppliers (at the time of writing the report) and the scope of work.
- **Assumption 6**: Scottish Water will need to grow internal capacity for DV4 by 30% a year on average in real terms. Turner & Townsend did not provide a confidence assessment for this assumption.

1.8.19. Turner & Townsend also examined several modelling scenarios of overall capacity using the available data from Scottish Water and the DV4 bidders to test assumptions 5 and 6, and

assessed that there is a limited level of confidence in the round that there is sufficient capacity available to deliver the draft investment programme proposed in the draft business plan of £8.3 billion (2023-24 prices).

1.8.20. With respect to delivery performance and external constraints on the supply chain arising from the investment programmes of water and other infrastructure companies in the UK, the consultants observed that England & Wales water companies faced similar challenges in delivering their investment programmes during their previous regulatory period. The investment programme for the regulatory period, which started in 2025, represents a significant step change in delivery and performance expectations, and while 85% of companies are confident in their ability to deliver their objectives, other stakeholders (including the supply chain) appear less certain, with only 40% of suppliers being confident of the same for example (as of October 2025).[114]

1.8.21. The executive summary of Turner & Townsend's report for WICS on the efficient size of Scottish Water's investment programme in the 2027-33 period is available on our website: Efficient size of Scottish Water's SRC27 investment programme | WICS.

### Scottish Water's feedback

1.8.22. In January 2026, Scottish Water submitted to WICS its feedback[115] in response to Turner & Townsend's draft report, which was shared for visibility. The feedback was also submitted as part of the final business plan. It was reviewed by our consultants, and clarifications were included in the final report where appropriate; however, the final recommendations and conclusions remained the same. The following paragraphs summarise selected points from Scottish Water's feedback and WICS' assessment of those points.

1.8.23. Overall, Scottish Water noted in its feedback that the findings must be treated with caution to ensure that uncertainties are fully recognised and that fair and balanced inferences are drawn. It considers that the evidence and findings in the report are not sufficiently robust and in general cannot be directly correlated to the overall conclusions on confidence levels at £6bn, £7bn and £8bn programme sizes (in 2023-24 prices).

1.8.24. WICS considers that, given the nature of the consultants' assessment, the conclusions and confidence levels are based on an overall evaluation of the evidence rather than a formulaic relationship between individual pieces of evidence and specific conclusions. We recognise this feature of the analysis, which is one of many inputs into our overall determination of investment allowances.

[114] Utility Week, PA Consulting (2025), 'The deliverability divide: From infrastructure pipe dreams to collaborative delivery', 21 October 2025. Available at The deliverability divide

[115] Scottish Water (2026), 'Scottish Water Response to the Turner and Townsend 'Capacity' Report – January 2026', 26 February 2026.

1.8.25. Scottish Water noted that the report focuses on the new delivery vehicle and highlighted that this is one of several vehicles that will account for approximately a third of Scottish Water's annual investment. Scottish Water stated that Turner & Townsend's assessment that a new enterprise model delivery vehicle requires approximately two years to mature was inconsistent with advice it had received. Our consultant has explained that this assessment is based on their experience with the enterprise model implemented by other companies.

1.8.26. Scottish Water also commented on the assessment of the 6 assumptions underpinning the delivery capacity forecast (see paragraph 1.8.17), highlighting the mitigation measures it has implemented and evidenced. Scottish Water further considers that the reduced investment programme in the final business plan, compared to the draft plan (which was used as the basis for the report), further mitigates the identified risks.

1.8.27. Scottish Water made several other detailed points as part of its feedback, which we have noted.

### Additional investment deliverability evidence in the final business plan

1.8.28. Scottish Water's feedback on the draft report and its final business plan submission provided updated evidence on the DV4 procurement processes and the actions and risk mitigation measures it is taking. This additional evidence is summarised and examined below.

1.8.29. In December 2025, Scottish Water confirmed the 7 preferred bidders for the DV4 procurement process.[116] At the time of the final business plan submission, Scottish Water had not yet completed all legal and contract-signing processes with the bidders. However, it did provide an updated view of forecast capacity and forecast investment allocated to each Delivery Vehicle, with the DV4 information reflecting the information shared by the 7 preferred bidders.

1.8.30. Scottish Water's 'SR27 Supply Chain Capacity (November 2025)' report shows in Graphs 9 and 10 (on page 10 and 11) the core or base capacity[117] and the growth capacity of the 7 preferred bidders for DV4, respectively. Scottish Water explained to us during our final business plan query process that the graphs in the report compare the delivery vehicle capacity to a view of the investment profile for that DV as of November 2025; however, the

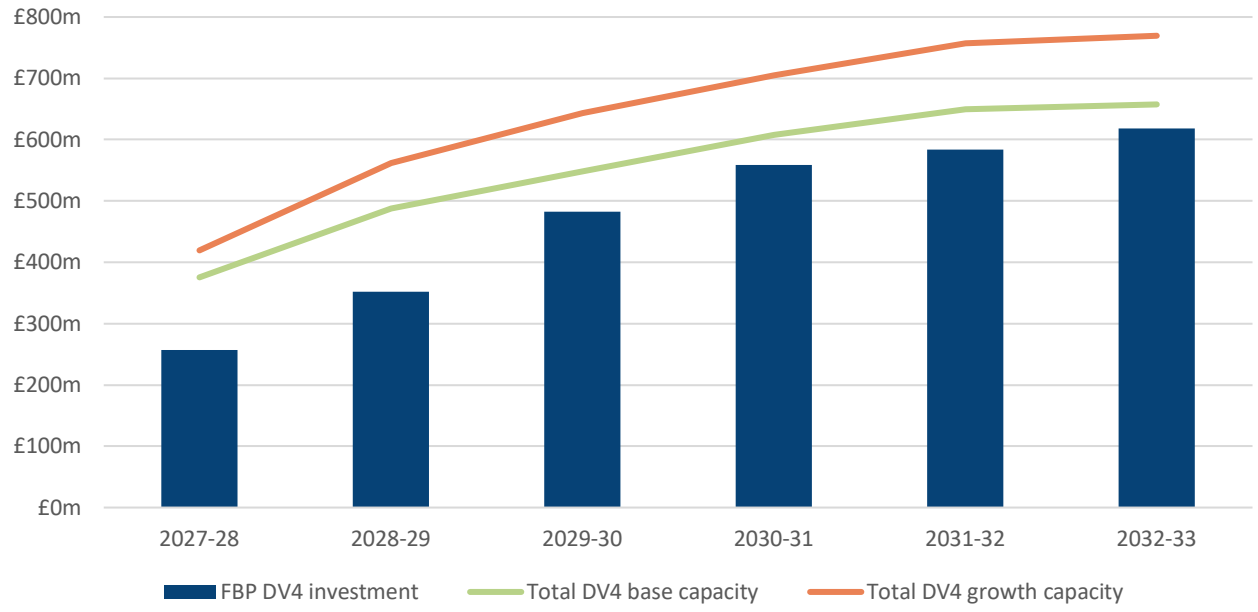
[116] WaterBriefing (2025), 'Scottish Water confirms 7 preferred bidders to deliver multi-billion pound transformation of water and waste water infrastructure', 19 December 2025. Available at https://www.waterbriefing.org/home/contracts/item/24816-scottish-water-confirms-7-preferred-bidders-to-deliver-multi-billion-pound-transformation-of-water-and-waste-water-infrastructure

[117] Scottish Water defines "base capacity" as "a sustainable capacity position each bidder is willing to commit to". "Growth capacity" is defined as "a capacity position that can be reached but may have associated constraints or challenges". The definitions are sourced from materials Scottish Water submitted to WICS and Turner & Townsend in August 2025.

investment profiles continued to be refined until the submission of the plan in February 2026.

1.8.31. Figure 3 below compares the DV4 base and growth capacity of the 7 preferred bidders (using data provided by Scottish Water during the query process) to the DV4 investment profile from the final business plan. It appears that the 7 preferred bidders for DV4 are expected to provide sufficient base capacity to deliver the final business plan investment in each year.

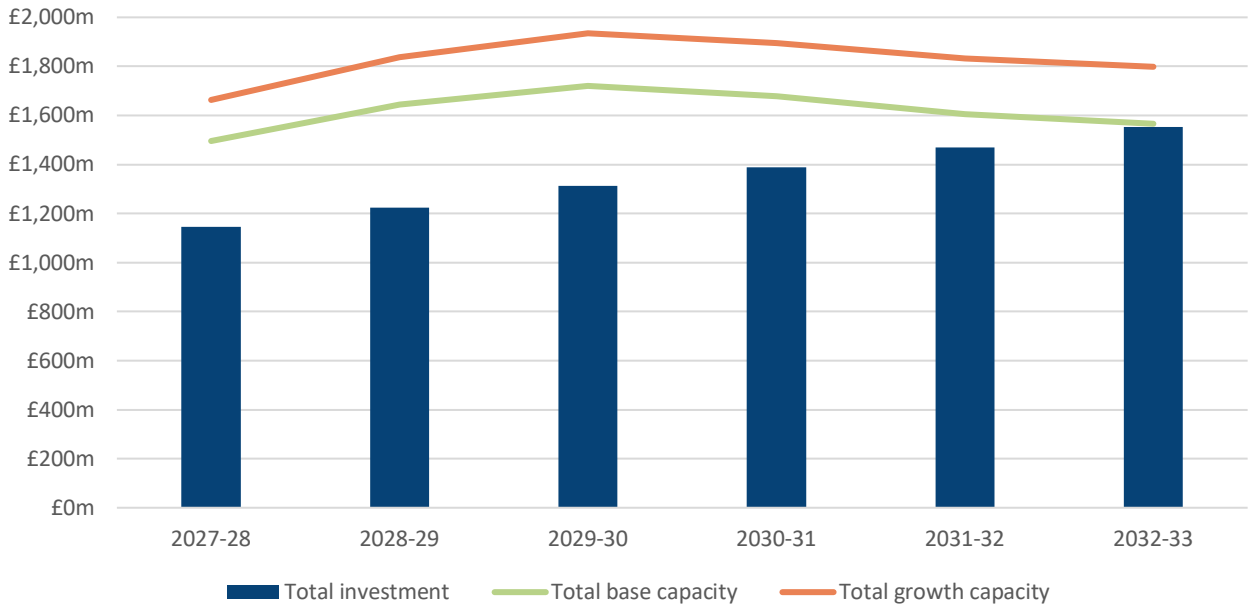
*Figure 3: DV4 (and adjusted Scottish Water) capacity versus business plan DV4 investment* [118]




1.8.32. Figure 4 below shows how the total capacity across all vehicles compares with the final business plan investment profile (assuming the capacity for the 7 preferred bidders for DV4). At the end of the period, the forecast base capacity is only around £13 million above the forecast investment (or 1% of total base capacity). Scottish Water explains in the 'SR27 Supply Chain Capacity (November 2025)' report that if a forecast capacity shortage materialises, it would work with its supply chain to ensure sufficient growth capacity is in place to cover expected demand.

[118] The DV4 total capacity data shared by Scottish Water during the query process consisted of the bidders' self delivery capacity and subcontracted capacity as well as Scottish Water's own capacity which was calculated as 15% of the November 2025 DV4 investment profile. Figure 1 uses the bidders' capacity data as well as a calculation of Scottish Water's capacity as 15% of the final business plan DV4 investment profile as per detailed data in Table X.

*Figure 4: Total delivery vehicle capacity versus total investment*




1.8.33. To further future-proof operations and supply chain resilience, Scottish Water highlights in its response to Turner & Townsend's draft report that it is taking various measures, such as:

- Standardising and streamlining asset design;
- Increasing off-site manufacture by selecting DV4 partners with the required capability and engaging new and non-traditional capacity. This reduces reliance on traditional civils-based supply chains;
- Designing DV4 to utilise production planning and for partners to work in an integrated team for better investment optimisation;
- Engaging the supply chain in long-term investment programmes and planning to reserve the required capacity and, in turn, provide security for partners in future work;
- Improving productivity and DV4 teamwork between partners via the new common digital platform; and
- Committing DV4 partners to develop a talent pipeline with Scottish Water for SRC27 and SRC33 periods, including creating job opportunities for young people.

1.8.34. Overall, Scottish Water concludes that "there are no major risks or concerns in terms of securing the necessary capacity to deliver the investment programme and Scottish Water has confidence that the required supply chain capacity will be available".[119] This is caveated by Scottish Water with "The delivery profile is (as would be expected at this stage of the

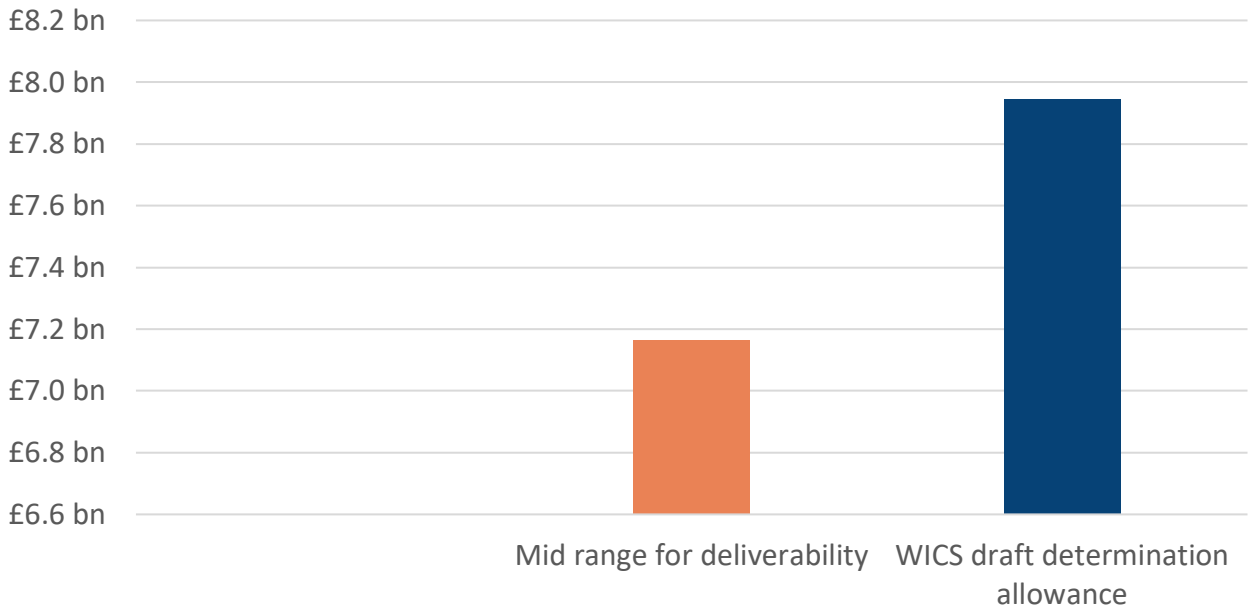
[119] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 011 – Supply Chain', 26 February 2026, p. 13.

process) immature and is not likely to reflect the final delivery plan. This is a work in progress, and provides an early modelling profile".[120]

### Implications for our Determination

1.8.35. Taking the evidence in the round, we consider that our Draft Determination allowance achieves an appropriate balance between maintaining the long-term approach and protecting future customers, and deliverability over the 2027-33 regulatory period. Figure 5 compares our Draft Determination allowance to the deliverability range based on our analysis.

*Figure 5: Comparison against deliverability range (2024-25 prices)*




1.8.36. However, we consider that some delivery risks remain (related to those highlighted in paragraph 1.8.18).

1.8.37. As such, we consider the mitigation measures and assurances Scottish Water is putting in place, which include:[121]

- Annual price validation exercises to verify that the pricing in its established frameworks is competitive within the current market;
- Reporting and monitoring of the 'pound in the ground' metric;

[120] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 011 – Supply Chain', 26 February 2026, p. 3.
[121] Scottish Water (2026) 'SR27 Final Business Plan: Technical Appendix 011 – Supply Chain', Section 2.2.2, 26 February 2026.

- Quarterly reporting to the Capital Investment Leadership Team of a capacity and organisational health tracker covering DV1 and DV2, and monthly reporting of supply chain risk to key members of the leadership team;
- Monitoring of trading and financial risks of suppliers and preparing mitigation measures for areas with significant risks to services; and
- Annual reviews of structural risks within Scottish Water's supply chain.

1.8.38. Furthermore, Scottish Water has informed us that it is undertaking further work on internal capacity and supply chain readiness. It has proactively engaged with us on the scope for one such project, which is being completed by another team within Turner & Townsend. The consultants have been asked to conduct an evidence-based review of Scottish Water's recent progress in portfolio deliverability and management and in procuring its SRC27 supply chain and securing capacity; to identify gaps and required mitigations to ensure efficient and reliable delivery through internal stakeholder engagement; and to deliver clear recommendations with a prioritised 6-12-24 month improvement roadmap aligned to governance and delivery models. We understand the work will also aim to address some of the identified risks. We understand that this analysis will be completed prior to the close of the consultation on the Draft Determination on 1 September 2026.

1.8.39. Therefore, we require Scottish Water to share the internal capacity and supply chain readiness assessment with us on 1 September 2026, to enable us to take it into account in our Final Determination. We also require a further assurance statement from Scottish Water's Board that it has both the internal capacity and supply chain capacity to deliver the proposed investment in the Draft Determination as part of its response to the Draft Determination consultation on 1 September 2026.

1.8.40. We will monitor delivery closely in the 2027-33 regulatory period as part of our monitoring safeguards set out in Chapter 10 of the Draft Determination.

## 1.9. Scottish Water's improvement plans

1.9.1. This section covers Scottish Water's proposed data improvement plans from the final business plan as per WICS methodology requirements, and our view of those plans.

1.9.2. Our SRC27 methodology recognised that Scottish Water's measure(s) of asset condition are at an early stage of maturity and would require further development during the SRC27 period. As such, we required Scottish Water's business plan to include an improvement plan to address the data and knowledge gaps in its asset condition reporting and forecasting.

1.9.3. Scottish Water provided several data improvement plans for asset health and condition, and for its data and analytic capabilities within its draft business plan. In our feedback, we clarified our expectations that the plans should be more detailed, covering the expected milestones and the due dates for making the proposed improvement activities that Scottish

Water could be held accountable for meeting. We also requested that for each improvement activity, Scottish Water indicate when the information would be reported to WICS with reference to the annual return submission in a specific year. This will allow us to assess whether Scottish Water is making appropriate progress in improving the gaps in its data and knowledge of the condition of its assets.

1.9.4. We are pleased to see that Scottish Water has addressed our feedback and has provided further detail in its improvement plans, including clear milestone commitments, required activities to achieve them and the form of evidence expected to demonstrate milestone completion. This is presented in technical appendix 8 'Investment Planning', section 9 and Annex D and covers the following 5 milestones:

- Align all Management Approaches with the SRC27 allocations by 2026-27 Quarter 2 for the SRC27 Delivery Plan;
- Implement a Basic Health Measure for all replaceable assets by 2026-27 Quarter 4;
- Define and demonstrate an Intermediate Health Measure by 2026-27 Quarter 4;
- Implement a Target Health Measure for all replaceable assets by 2028-29; and
- Implement data improvement processes and quality metrics by 2026-27 Quarter 2 (for install date) and by 2027-28 Quarter 4 (for data for the target measure).

1.9.5. The commentary for the final business plan Table 3b 'Asset Health' also explains that Scottish Water plans to develop the Equipment Health Index metric from Basic to Intermediate between 2025 and 2028, and to Advanced/Hybrid between 2028 and 2033, which would take into account asset condition, performance, repair impact, environmental conditions, and asset criticality.[122] Scottish Water also explains that it plans to include in a future EHI version its "infinite-life assets", which it considers will not be replaced but only repaired and refurbished (e.g. reservoirs, aqueducts, dams, sewers). However, it does not specify when it expects to do so. These "infinite-life assets" account for about two-thirds of Scottish Water's asset base in terms of their asset value.[123]

1.9.6. Scottish Water also has a Routemap to 2030 to improve the management approach process and underlying asset data, which its external assurance refers to. There are, therefore, several initiatives underway to improve asset management processes and information. We require Scottish Water to consolidate the list of actions from its various asset management improvement plans to allow WICS to monitor progress and provide this consolidated list as part of its response to our Draft Determination consultation by 1 September 2026. This will ensure we can measure Scottish Water's progress, as we will need to see these improvements before the Strategic Review of Charges 2033 (SRC33).

[122] Scottish Water (2026), 'SR27 Final Business Plan: Table 3b – Asset Health Commentary', 26 February 2026, p. 7.
[123] Calculated based on Scottish Water's final business plan Data Tables 3a and 3b: MEAV of 'Infinite-Life Assets' as a percentage of total MEAV for the asset base.

1.9.7. Overall, we welcome Scottish Water's clear commitments to the proposed milestones for developing the asset health measure(s) and improving its knowledge of its asset base. We will monitor Scottish Water's progress against the milestones and reflect this in our performance reports throughout the period. We expect Scottish Water to provide further detail in its SRC27 Delivery Plan on how it will achieve these milestones, as well as further clarity on when the asset health measure(s) will be able to cover the full asset base, including the "infinite-life assets" which form a significant part of it.

## 1.10. Overall conclusions from the review of the investment plan

1.10.1. Table 94 below summarises WICS' draft allowance for each investment programme from Scottish Water's business plan following our review as explained in this appendix. As explained in Chapter 5 of the Draft Determination, we also apply a further efficiency productivity challenge to this allowance and we also allow some additional investment. These adjustments are captured in the last rows of the table below.

*Table 94: Draft Determination allowance for investment[124]*

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA001 - Water Quality | Water Treatment | 1,294 | 1,267 | Cost challenge on the project for Daer WTW (-£13.4 million) and on the programme for maintaining chlorine contact tanks (-£13 million). |
| TA001 - Water Quality | Water Storage | 318 | 289 | Cost challenge on the programme for maintaining treated water storage (-£29 million). |
| TA001 - Water Quality | Water Distribution | 64 | 64 | |
| TA001 - Water Quality | Lead Management | 36 | 34 | Cost challenge on the programme for replacing lead communications pipes (-£3 million). |
| TA001 - Water Quality | Raw Water and Catchment Management | 9 | 9 | |
| TA002 - Water Continuity | Abstraction, Sources and Raw Water Transfers | 427 | 413 | Cost challenge on the programme for resolving matters in the interest of safety (maintaining dams and ancillary items; -£14 million). |
| TA002 - Water Continuity | Water Treatment | 7 | 7 | |
| TA002 - Water Continuity | Water Transmission (trunk mains and strategic pipelines) | 99 | 99 | |

[124] WICS' draft allowance in this table is before applying an additional productivity efficiency challenge and before allowing additional unallocated investment. Please refer to Chapter 5 of the Draft Determination for more details on these further adjustments.

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA002 - Water Continuity | Water Pumping Stations | 48 | 43 | Cost challenge on the programme for maintaining pumping equipment (-£5 million). |
| TA002 - Water Continuity | Water Distribution | 686 | 682 | Cost challenge on the programme for maintaining distribution infrastructure meters and monitoring equipment(i.e. leakage management equipment; -£4 million). |
| TA002 - Water Continuity | Resilience and Growth | 126 | 126 | |
| TA002 - Water Continuity | Other Programmes | 377 | 368 | Cost challenge on the metering programme (-£9 million). |
| TA003 - Water Environment | Waste Water Treatment | 983 | 966 | Removal of the project Pathhead WWTW (-£6 million) and cost challenge on the programme for maintaining secondary treatment processes (-£11 million). |
| TA003 - Water Environment | Waste Water Bioresource Treatment | 157 | 138 | Removal of the project Allanfearn STC for replacing digestors (-£19.5 million). |
| TA003 - Water Environment | Water Treatment Works Sludge Storage | 17 | 17 | |
| TA003 - Water Environment | Waste Water Sewer Networks | 413 | 413 | |
| TA003 - Water Environment | Waste Water Other – Region Wide | 291 | 291 | |

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA003 - Water Environment | Water Abstraction - Water Resources Environmental Monitoring and Compliance | 6 | 6 | |
| TA003 - Water Environment | Water Reservoir Compensation Compliance and RBMP Enhancement | 40 | 40 | |
| TA003 - Water Environment | Other PFI Transfers | 7 | 7 | |
| TA004 - Managing Quantity of Flows | Asset Repair, Refurbishment and Replacement (AR3) | 603 | 603 | |
| TA004 - Managing Quantity of Flows | Enhancement | 367 | 367 | |
| TA005 - Enabling Growth | Waste water Growth | 319 | 319 | |
| TA005 - Enabling Growth | Water Growth | 71 | 71 | |
| TA005 - Enabling Growth | Infrastructure Investment | 123 | 96 | Reducing allowance for Part 3 growth investment as per Scottish Water's updated expenditure forecast for water (-£12 million) and for wastewater (-£15 million). |
| TA005 - Enabling Growth | Service Relocations | 38 | 28 | Cost challenge on the programme for service relocations (-£10 million). |
| TA006 - Climate Adaptation | Enhancement to Scotland's natural capital | 7 | 7 | |
| TA006 - Climate Adaptation | Increase biodiversity beyond statutory levels | 5 | 5 | |

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA006 - Climate Adaptation | Understand the implications of climate change and risks to service resilience | 2 | 2 | |
| TA007 - Climate Mitigation | Process Emissions | 15 | 15 | |
| TA007 - Climate Mitigation | Carbon Capture | 29 | 21 | Cost challenge on the programme for carbon capture (-£8 million). |
| TA007 - Climate Mitigation | Pilot activities | 16 | 16 | |
| TA010 - West Central Bioresources | West Central Bioresources | 557 | 557 | WICS will allow the full WCB proposed investment, subject to conditions in the charge cap. See Chapter 8 of the Draft Determination. |
| TA015 - Customer and Communities | Customer Research | 2 | 2 | |
| TA015 - Customer and Communities | Priority Service Register Improvements | 4 | 4 | |
| TA015 - Customer and Communities | Digital Developments for Customer Experience enhancements | 5 | 5 | |
| TA015 - Customer and Communities | Access to assets | 6 | 6 | |
| TA015 - Customer and Communities | Campaigns & marketing | 4 | 4 | |
| TA017 - Digital | Efficient planning & delivery | 17 | 17 | |
| TA017 - Digital | Risk and Security | 46 | 46 | |

| Technical Appendix Area | Investment Programme | Investment in final business plan (2024-25 prices; £m) | WICS allowance in Draft Determination (2024-25 prices; £m) | Explanation for allowance |
|---|---|---|---|---|
| TA017 - Digital | Commodities & Infrastructure | 44 | 44 | |
| TA017 - Digital | Intelligent Decision Making | 1 | 1 | |
| TA018 - Transformation & Innovation | Enable Innovation | 23 | 23 | |
| TA018 - Transformation & Innovation | Lighthouse projects | 5 | 5 | |
| TA018 - Transformation & Innovation | Research and Hydro Nation | 4 | 4 | |
| Support Services | Juniper House | 110 | 110 | |
| Support Services | Maintain existing fleet | 115 | 115 | |
| Support Services | Maintain existing offices and estates | 66 | 53 | Cost challenge on the programme for maintaining offices and estates (-£13 million). |
| Support Services | Maintain existing renewable energy | 18 | 18 | |
| Support Services | Maintain scientific equipment | 7 | 7 | |
| Real Price Effects | Real Price Effects | 60 | -15 | |
| | **Total before additional cost challenge and allowance** | **8,093** | **7,833** | |
| | WICS cost challenge for general productivity improvements | | -55 | |
| | WICS additional investment allowances | | 168 | |
| | **Draft Determination allowed for investment** | | **7,946** | |

# 2. Productivity efficiency analysis

2.1.1. We reviewed Scottish Water evidence from the final business plan technical appendix 12. We cover each of the following areas in turn below:

- ONS UK and Scottish Government productivity data trends;
- CMA provisional findings for referrals of the Ofwat final determinations for 2025-30;
- consultant reports, regulatory precedent and international data; and
- Scottish Water's investment in transformation initiatives.

*Review of the ONS UK and Scottish Government productivity data trends*

2.1.2. Scottish Water's final business plan includes an analysis of labour productivity for both the UK, based on data from the Office for National Statistics (ONS), and Scotland, based on data from the Scottish Government.[125] Scottish Water explains that this analysis shows a significant shift in the trend of overall productivity growth in the Scottish and UK economy since the global financial crisis in 2008. For example, in the UK, Scottish Water explains that labour productivity growth was trending at 1.9% per annum prior to 2008, but at only 0.5% per annum on average thereafter. Scottish Water uses this evidence to explain that productivity trends have fallen materially since 2008 and that using data from as far back as 1996 may not be representative of likely productivity levels in 2007.

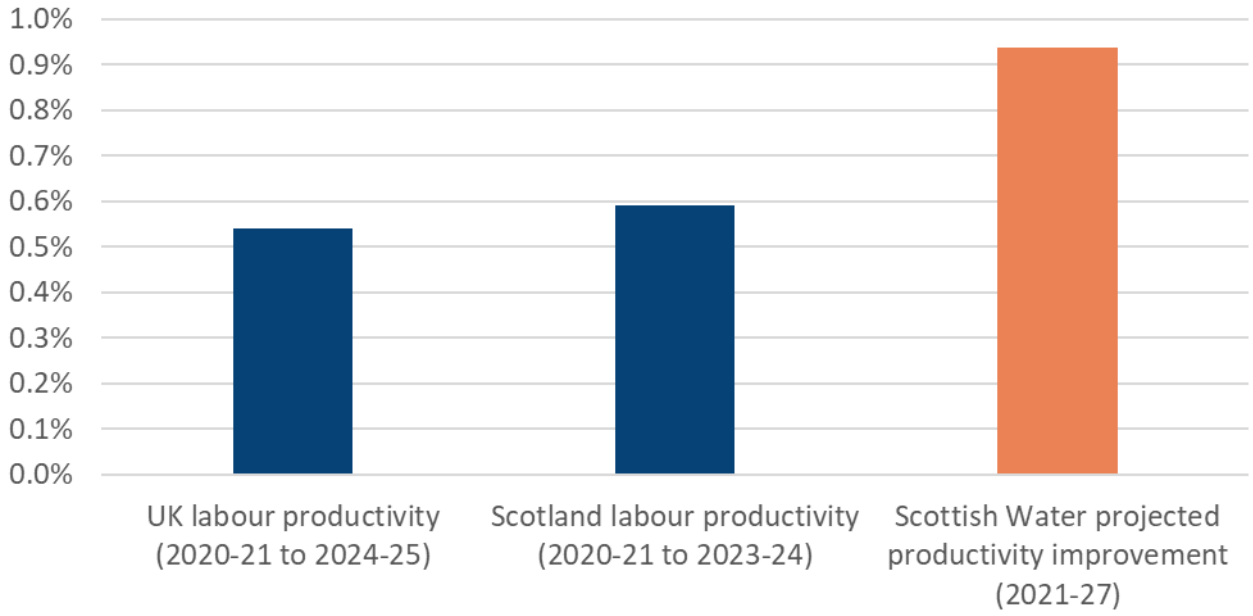
2.1.3. We recognise that observed productivity improvements in the general economy in Scotland and the UK have slowed since 2008. However, Scottish Water also explains that it is broadly on track to meet the 1% per annum productivity improvement assumption set by WICS for the 2021-27 regulatory period. If this is the case, then Scottish Water is likely to exceed overall productivity in Scotland and the UK over the same timeframe.[126]

2.1.4. To illustrate this point, Figure 6 shows Scottish Water's actual and forecast productivity improvements over the 2021-27 regulatory period, compared to labour productivity in the

[125] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 012 - Efficiency', 26 February 2026, pp.40-42.
[126] UK labour productivity is from ONS (2026), 'Productivity flash estimate and overview', 17 February. Scotland labour productivity is from Scottish Government (2025), 'Labour productivity statistics: 2024', 24 September. Scottish Water's analysis shows labour productivity in the UK and Scotland, which we note is not the same as total factor productivity. Labour productivity is a simple measure of productivity, calculated by dividing output by labour input, usually hours worked. Total factor productivity (TFP) measures the efficiency with which labour and capital are combined in the production process. Labour productivity comprises both TFP and capital deepening, which measures the amount of capital per worker (as capital per worker increases, each worker can produce more output). See Office for National Statistics (2022), 'Estimates of total factor productivity from the Annual Business Survey, Great Britain: 1998 to 2019', 26 August 2022; and Office for Budget Responsibility (2025), 'Briefing paper No.9 Forecasting productivity', November.

UK and Scotland from 2021 onwards, using the same data sources for Scotland and UK productivity that Scottish Water uses in its final business plan.[127]

Figure 6: Productivity improvements in the UK and Scotland (average annual)




2.1.5. Figure 6 shows that Scottish Water is likely to exceed observed productivity improvements in Scotland and the UK, with Scottish Water's projected productivity improvements over 2021-27 around 0.3%-0.4% above labour productivity in the general economy in Scotland and the UK from 2021 onwards.

2.1.6. WICS considers Scottish Water's observed performance in achieving the long-term trend in productivity in the water industry of 1% and its outperformance of productivity in the general economy as important pieces of evidence to consider when assessing the scope for productivity improvements over the 2027-33 period. The next section examines the CMA's provisional findings for the referrals of the Ofwat final determinations for 2025-30, which Scottish Water has placed weight on when considering the assumption for productivity improvements over the 2027-33 regulatory period.[128]

*Review of the CMA provisional findings relating to the Ofwat PR24 redeterminations*

2.1.7. We have examined the CMA's approach to productivity improvements or 'frontier shift' in the Ofwat PR24 redeterminations. Frontier shift is the rate of efficiency improvements that even the most efficient companies can achieve from improvements in working practices and

[127] To be conservative, the figure is based on Scottish Water's actual to date and forecast reduction in recurring costs of 5.5% over 2021-27. This is equivalent to an annualised reduction of around 0.95%, rather than the full 1% efficiency challenge for recurring and capital costs that Scottish Water refers to elsewhere in the final business plan.
[128] See Scottish Water (2026), 'Final Business Plan 2027-2033 Investing in Scotland's Future', 26 February 2026, p.31.

the introduction of new technology.[129] In examining the scope for productivity improvements, the CMA assessed two core questions:

- How comparable is the water sector in England and Wales to the rest of the economy in terms of productivity changes, and has it also been affected by low productivity growth since the global financial crisis?
- What are the forecasts for productivity growth in the economy as a whole and for the water sector?

2.1.8. On the first question, the CMA found that the water sector in England and Wales has performed largely in line with the wider economy over the recent period. As such, it assessed official forecasts of productivity change in the wider economy to inform its decision on frontier shift over the 2025-30 period as part of its second question.

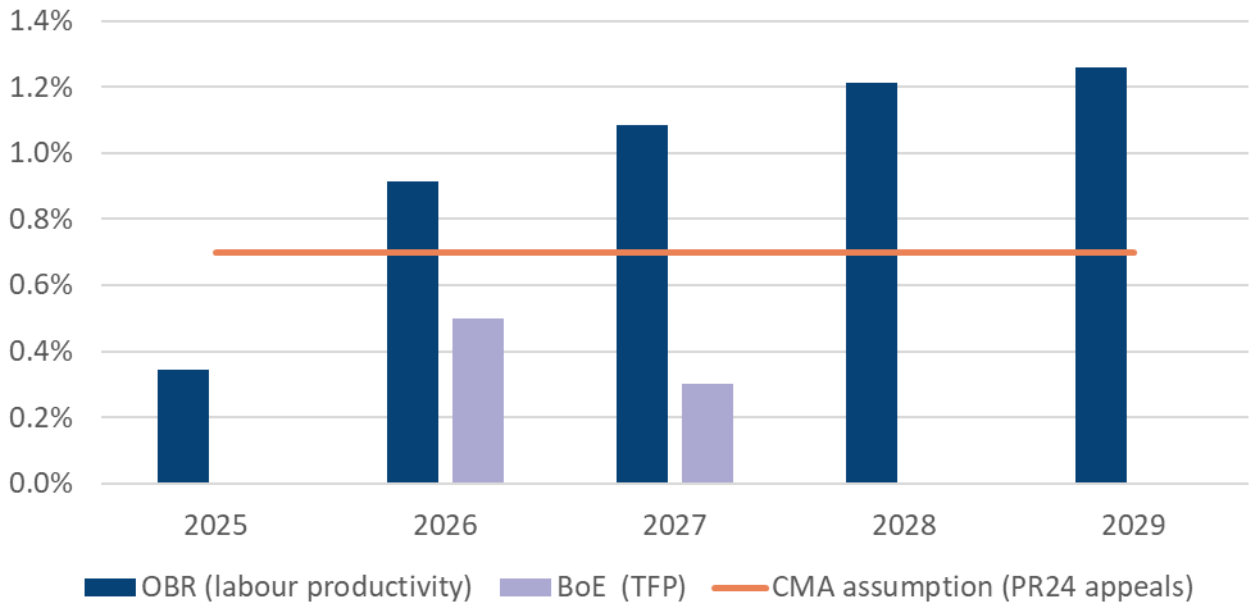
2.1.9. The CMA reviewed productivity forecasts from the Bank of England (forecasts from February 2025) and Office for Budget Responsibility (OBR; forecasts from March 2025).[130] It noted that:

- In February 2025, the Bank of England forecasts average total factor productivity (TFP) growth of 0.27% for the UK economy from 2025-2027;[131] and
- In March 2025, the OBR predicted that labour productivity growth (measured output per hour worked) would be 0.3% in 2024, 0.3% in 2025, 0.9% in 2026, 1.1% in 2027, 1.2% in 2028 and 1.3% in 2029.

2.1.10. The CMA noted that the forecasts differ in their levels and time coverage, with the Bank of England being more pessimistic than the OBR and not providing forecasts beyond 2027. Nevertheless, the CMA placed weight on these economy-wide forecasts in deciding to set a frontier-shift efficiency challenge of 0.7%.[132] Figure 7 shows these third-party forecasts and the CMA's decision.

[129] Competition and Markets Authority (2025), 'Water PR24 References Provisional Determinations Volume 1: Introduction, Background, Approach and prioritisation, Base costs – Chapters 1-4', October 2025, pp.59-88.
[130] Bank of England (2025) Monetary Policy Report', 6 February 2025, p.85; and Office for Budget Responsibility (2025), 'Economic and fiscal outlook', 26 March 2025, p.28.
[131] This is based on an average of the Bank of England's TFP growth projects for 2025 (0.0%), 2026 (0.5%) and 2027 (0.3%).
[132] Competition and Markets Authority (2025), 'Water PR24 References Provisional Determinations Volume 1: Introduction, Background, Approach and prioritisation, Base costs – Chapters 1-4', October 2025, p.85.

*Figure 7: Annual productivity forecasts and CMA decision*[133]



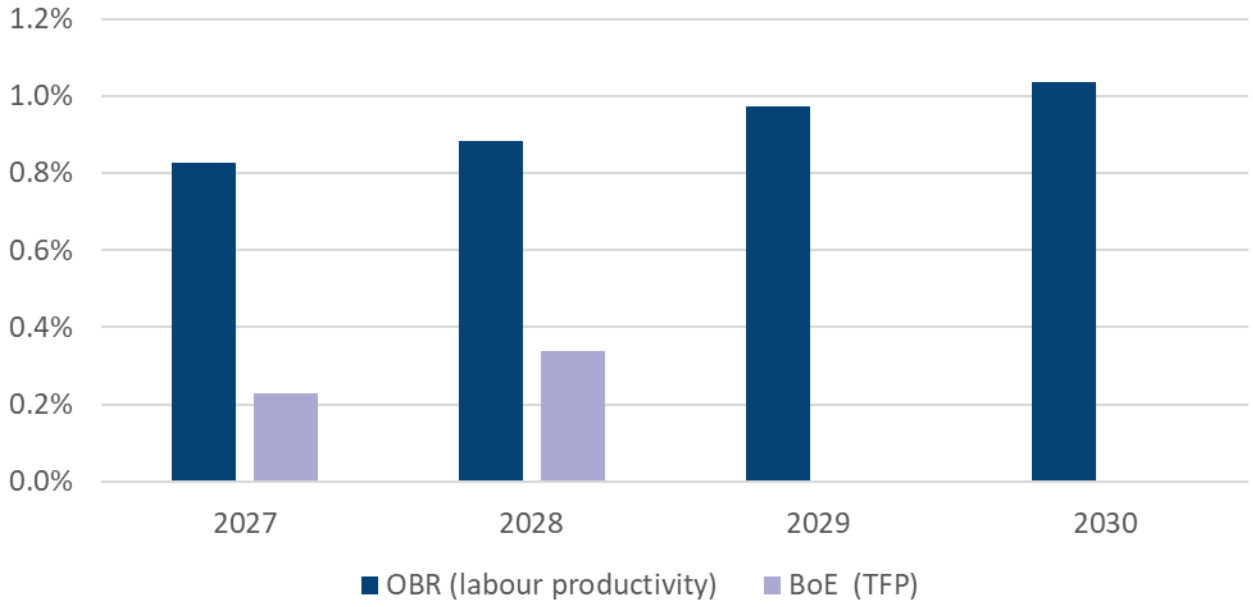

2.1.11. We note that the CMA's decision of 0.7% is in line with the average rate between the Bank of England and OBR forecasts over the five-year period covering the calendar years 2025 to 2029, which aligns with the financial years of the regulatory period 2025-26 to 2029-30.[134]

2.1.12. We consider that the CMA's methodology and analysis are useful; however, the period covered by the CMA's analysis (2025-29) only covers the first three years of the 2027-33 regulatory period in Scotland. The analysis shows that productivity forecasts are on an upward trend over the three years that overlap (calendar years 2027 to 2029), suggesting that the CMA might have adopted a different estimate if it had examined the period 2027-33.

2.1.13. However, we also note that the Bank of England and the OBR have since published lower productivity forecasts.[135] These updated forecasts are shown in Figure 8 for the first four years of the 2027-33 regulatory period. Note that the Bank of England Monetary Policy Committee do not provide a forecast beyond 2028.

[133] Bank of England is abbreviated to BoE in the figure. The Bank of England only provided forecasts to 2027 in its February 2025 Monetary Policy Report.
[134] 0.7% is in line with productivity growing each year at an average rate between the OBR and BOE productivity growth forecasts (using only OBR forecasts for 2028 and 2029, given the Bank of England has not provided a forecast beyond 2027) when expressed on an annual basis.
[135] The latest OBR forecasts are available in Office for Budget Responsibility (2026), 'Economic and fiscal outlook – March 2026', 3 March 2026. The latest Bank of England forecasts are available in Bank of England (2026), 'Monetary Policy Report – February 2026', 5 February 2026.

*Figure 8: Annual productivity forecasts (February and March 2026)*




2.1.14. We note that while OBR forecasts lower productivity overall, it still expects labour productivity, which the CMA considered for its analysis of frontier shift,[136] to reach around 1% in 2029 and 2030.

2.1.15. Scottish Water's final business plan explains that the OBR reduced its medium-term forecast for total factor productivity to 0.8% in its economic and fiscal outlook published in November 2025.[137] The OBR has maintained this forecast in its more recent economic and fiscal outlook published in March 2026.[138] Total factor productivity is a component of labour productivity, reflecting the efficiency with which labour and capital are combined in the production process. It reflects the status of global technology and knowledge and the degree to which that technology and knowledge are used effectively domestically.[139] It accounts for 0.8% of the 1% forecast for labour productivity in Figure 8.[140]

2.1.16. The OBR expects growth in total factor productivity over the period to 2030 driven by two factors:

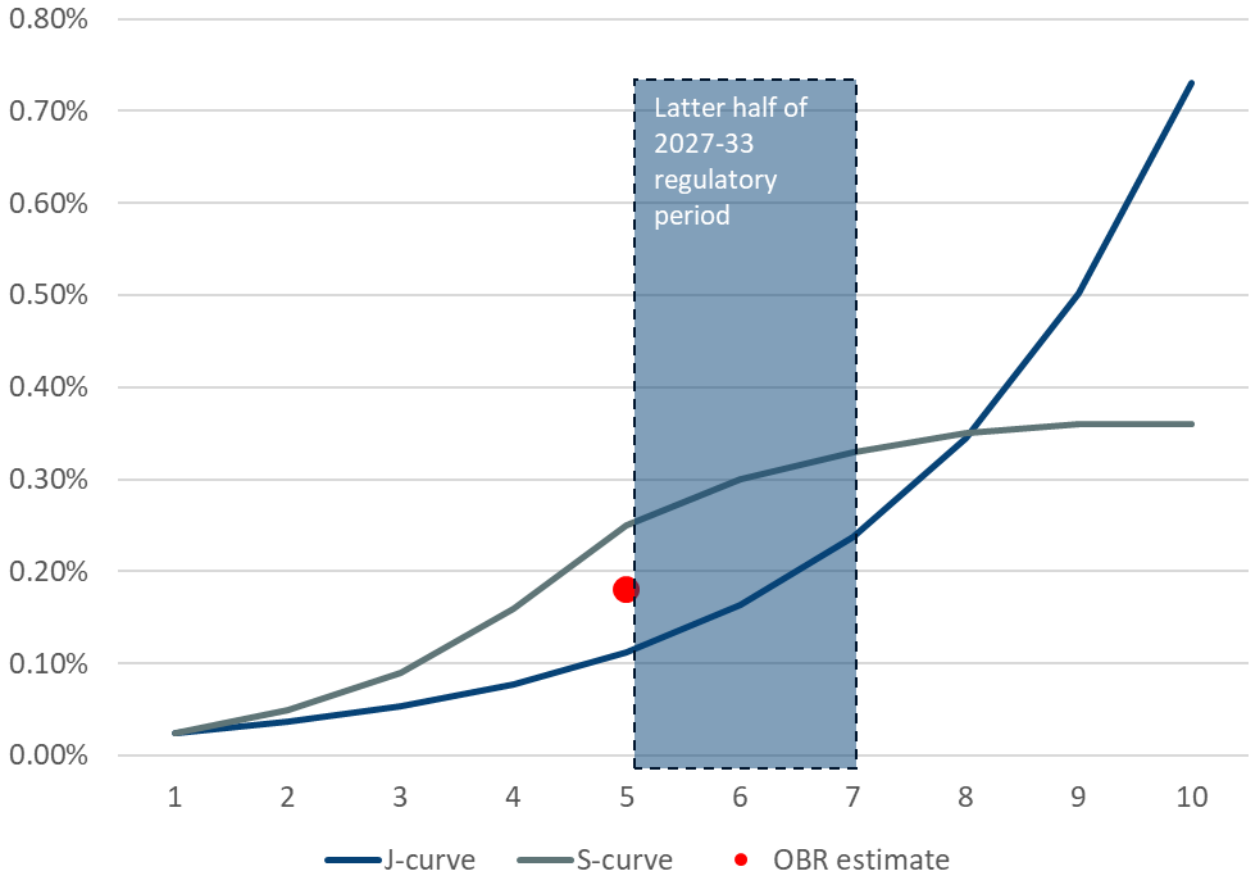
- recovery from previous economic shocks; and

[136] Competition and Markets Authority (2025), 'Water PR24 References Provisional Determinations Volume 1: Introduction, Background, Approach and prioritisation, Base costs – Chapters 1-4', October 2025, pp.83-84.
[137] Office for Budget Responsibility (2025), 'Economic and fiscal outlook', 26 November 2025, p.6.
[138] Office for Budget Responsibility (2026), 'Economic and fiscal outlook – March 2026', 3 March 2026.
[139] Office for Budget Responsibility (2025), 'Briefing paper No. 9 forecasting productivity', 26 November 2025, p. 9.
[140] The remainder is accounted for by capital deepening, which measures the amount of capital per worker (as capital per worker increases, each worker can produce more output). See Office for Budget Responsibility (2026), 'Economic and fiscal outlook – March 2026', 3 March 2026, p.20.

- wider deployment and use of artificial intelligence (AI), which makes up 0.2% of the 0.8% forecast growth in total factor productivity by 2030.[141]

2.1.17. On the impact of AI on TFP, the OBR presents scenarios covering both the magnitude and profile of that impact over a decade and the implications for its medium-term forecast. These scenarios are shown in Figure 9.[142]

*Figure 9: Estimated impact of AI on UK productivity*




2.1.18. As shown in Figure 9, the OBR assumes that AI will add 0.2% to growth in total factor productivity over its medium-term forecasting horizon of 5 years (which is 2030). However, we also note that the OBR expects the impact of AI on growth in total factor productivity to increase beyond this period, which aligns with the latter half of the 2027-33 regulatory period (as shown in the blue shaded area).

2.1.19. We therefore consider that growth in total factor productivity is on an upward trend over the period to 2033, reflecting the wider deployment and use of AI in the UK. Based on the

[141] Office for Budget Responsibility (2025), 'Briefing paper No. 9 forecasting productivity', 26 November 2025, p.38.
[142] Figure replicated based on data published by the OBR. Office for Budget Responsibility (2025), 'Briefing paper No. 9 forecasting productivity', 26 November 2025, p.51.

data produced by the OBR, it has the potential to add around 0.3% to growth in total factor productivity by the end of the regulatory period (year 7 in Figure 9).

*Review of consultant reports, regulatory precedent and international data*

2.1.20. Scottish Water's final business plan refers to evidence produced by consultants commissioned by a consortium of water companies in England and Wales to advise them on the scope for a frontier shift over the 2025-30 regulatory period.[143] The consultants provided a range of 0.3% to 0.8% per annum, with a focused range of 0.3% to 0.7%.

2.1.21. Scottish Water also refers to recent regulatory precedent, which we set out in Table 95.

[143] Economic Insight (2023), 'Productivity and frontier shift at PR24', 28 April 2023.

*Table 95: Regulatory precedent for productivity challenge in UK utilities*

| Recent UK price controls | Sector | Regulatory period | Productivity challenge |
|---|---|---|---|
| Ofwat PR19 | England and Wales water | 2020-2025 | 1.1%[144] |
| CMA PR19 | England and Wales water | 2020-2025 | 1.0%[145] |
| Ofgem RIIO-GD2 | GB energy | 2021-2026 | 1.2%[146] |
| Ofgem RIIO-T2 | GB energy | 2021-2026 | 1.2%[147] |
| CMA RIIO-2 | GB energy | 2021-2026 | 1.0%[148] |
| UR PC21 | Northern Ireland water | 2021-2027 | 0.7%[149] |
| UR GT22 | Northern Ireland energy | 2022-2027 | 0.8%[150] |
| Ofgem RIIO-ED2 | GB energy | 2023-2028 | 1.0%[151] |
| Commission for Regulation of Utilities – draft | Ireland water | 2025-2029 | 1.0%[152] |
| Ofwat PR24 | England and Wales water | 2025-2030 | 1.0%[153] |
| CMA PR24 – provisional | England and Wales water | 2025-2030 | 0.7%[154] |
| UR RP7 | Northern Ireland energy | 2025-2031 | 1.0%[155] |
| Ofgem RIIO-3 | GB energy | 2026-2031 | 1.0%[156] |

2.1.22. Of the 13 regulatory decisions in Table 95, 10 of the decisions have assumed productivity improvements in the regulated sectors above 1%. The most recent of these decisions is Ofgem's RIIO-3 determination for electricity and gas transmission and gas distribution published in December 2025, which covers the regulatory period 2026-31, the period that most closely aligns to the 2027-33 regulatory period in the Scottish water sector.

[144] Ofwat (2019), 'PR19 final determinations – Securing cost efficiency technical appendix', p. 121.
[145] Competition and Markets Authority (2021), 'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations – Final report', p. 263.
[146] Ofgem, 'RIIO-2 Final Determinations – Core Document', p. 12.
[147] Ofgem, 'RIIO-2 Final Determinations – Core Document', p. 48.
[148] Competition and Markets Authority (2021), 'RIIO-2 Energy Licence Modification Appeals – Summary of final determination', p. 8.
[149] Utility Regulator (2021), 'Water and Sewerage Services Price Control 2021-27 – PC21 Final Determination – Main Report', p. 86.
[150] Utility Regulator (2022), 'Price Control for Northern Ireland's Gas Transmission Networks – GT22 – Final Determination', p. 59.
[151] Ofgem (2022), 'RIIO-ED2 Final Determinations Overview document', p. 28.
[152] Commission for Regulation of Utilities (2025), 'Draft determination: revenue control 4', 25 November, p.123
[153] Ofwat (2025), 'PR24 final determinations: Expenditure allowances', p. 263.
[154] Competition and Markets Authority (2025), 'Water PR24 References – Provisional Determinations Volume 1: Introduction, Background, Approach and prioritisation, Base costs – Chapters 1-4', p. 79.
[155] Utility Regulator (2024), 'Northern Ireland Electricity Networks Ltd – Transmission and Distribution 7th Price Control (RP7)', p. 50.
[156] Ofgem (2025), 'RIIO-3 Final Determinations Overview Document', 4 December 2025, p. 97.

*Scottish Water's investment in transformation initiatives*

2.1.23. Scottish Water's final business plan technical appendix 18 explains that over the 2021-27 regulatory period it invested £259 million in transformation initiatives, resulting in gross benefits of £433 million and net benefits of £174 million.[157] Technical appendix 18 explains that these have made a contribution towards:

- Scottish Water meeting its efficiency challenge of 1% per annum by the end of the regulatory period; and
- have supported wider investment across the capital programme, with capital costs forecast to be around 6% lower at the start of the 2027-33 programme compared to the level in 2021.

2.1.24. Scottish Water provides examples of initiatives delivering the most benefits, include:

- The introduction of AI (Microsoft Co-pilot), which has increased productivity;
- Wastewater intelligent networks, which involves applying sensors to improve asset and network condition and performance management at lower cost; and
- Intelligent water networks, which involves improving asset and network condition intelligence.

2.1.25. Scottish Water explains that it plans to invest a further £113 million in transformation initiatives in the 2027-33 regulatory period, delivering around £405 million of gross benefits and around £292 million in net benefits. We understand that these initiatives include:

- Capital and digital procurement (£31 million);
- Continuous improvement and process excellence (£19 million);
- Digitisation, artificial intelligence and automation (£16 million);
- Further investment in its sustainable investment decision making (£10 million);
- Investment in data, insights and decision-support tools to enable earlier investment interventions and reduced reactive activity (£31 million); and
- Investment in partnerships with customers, communities, government and industry to deliver shared outcomes in water efficiency, resilience and sustainability (£6 million).

2.1.26. These initiatives relate to activities expected to improve productivity, such as further investment in artificial intelligence. Indeed, Scottish Water explains that these initiatives materially support its ability to meet its proposed productivity improvements of 0.8% per

[157] Scottish Water (2026), 'Business Plan 2027-2033 Technical Appendices Transformation & Innovation', 26 February 2026. Note that Scottish Water does not provide the price base for the transformation investment and benefits in the 2021-27 regulatory period.

annum. However, it has not provided a link between the proposed initiatives and the proposed productivity improvement of 0.8%.

2.1.27. Scottish Water states that its transformation initiatives have delivered £174 million in net benefits, helping reduce recurring costs by around 1% per year and capital costs by about 6% between 2021 and 2027. However, Scottish Water has not clearly explained how all of these cash savings are reflected in its reported and forecast operating and capital expenditure. Even so, with higher benefits of £292 million expected in 2027-33, it is reasonable to assume that Scottish Water should be able to achieve at least similar levels of productivity improvement to those it has claimed for the 2021-27 regulatory period.

# 3. Operating expenditure efficiency analysis

## 3.1. Background

3.1.1. WICS have used econometric cost models to assess Scottish Water's operating expenditure efficiency compared to the water companies in England and Wales. The econometric models compare Scottish Water with companies in England and Wales on a like-for-like basis, accounting for factors that make up a company's operating characteristics, such as population served, topography, and the population density of the company's area. After accounting for these factors, any observed cost differences should be due to management action.

3.1.2. WICS and Scottish Water have engaged in developing a shared understanding of the data set and methodology required to run the econometric models. Following this engagement, Ofwat has published 2024-25 data for its base expenditure models.[158] We have incorporated the 2024-25 data for both the England and Wales companies and Scottish Water into our modelling. We have also adjusted the models to account for Scottish Water's specific circumstances and to improve their statistical significance.

3.1.3. The data for Scottish Water is sourced from WICS's annual return unless otherwise stated. The data for the England and Wales companies is sourced from Ofwat's base modelling data.[159]

3.1.4. This benchmarking will provide an overall assessment to enable WICS to form an overall view of relative efficiency levels. We also examined Scottish Water's proposed additions individually to assess their merits. We consider that using benchmarking in this manner, rather than in a mechanistic way, is consistent with best practice.

3.1.5. This appendix provides the detailed reasoning of the econometric cost models that WICS have used. It covers the following areas:

- Wholesale water operating expenditure models;
- Wastewater collection and treatment operating expenditure models;
- Bioresources operating expenditure models;
- Efficient benchmark;
- Water resources and treatment special factor claim; and

[158] Base costs are routine, year-on-year costs which companies incur in the normal running of the business. It includes both operating expenditure which provides a base level of service to customers and capital maintenance which maintains that long-term capability of assets.
[159] Ofwat (2024), 'PR24-FD-CA03-Base-costs-water-model-1', 24 December 2024.

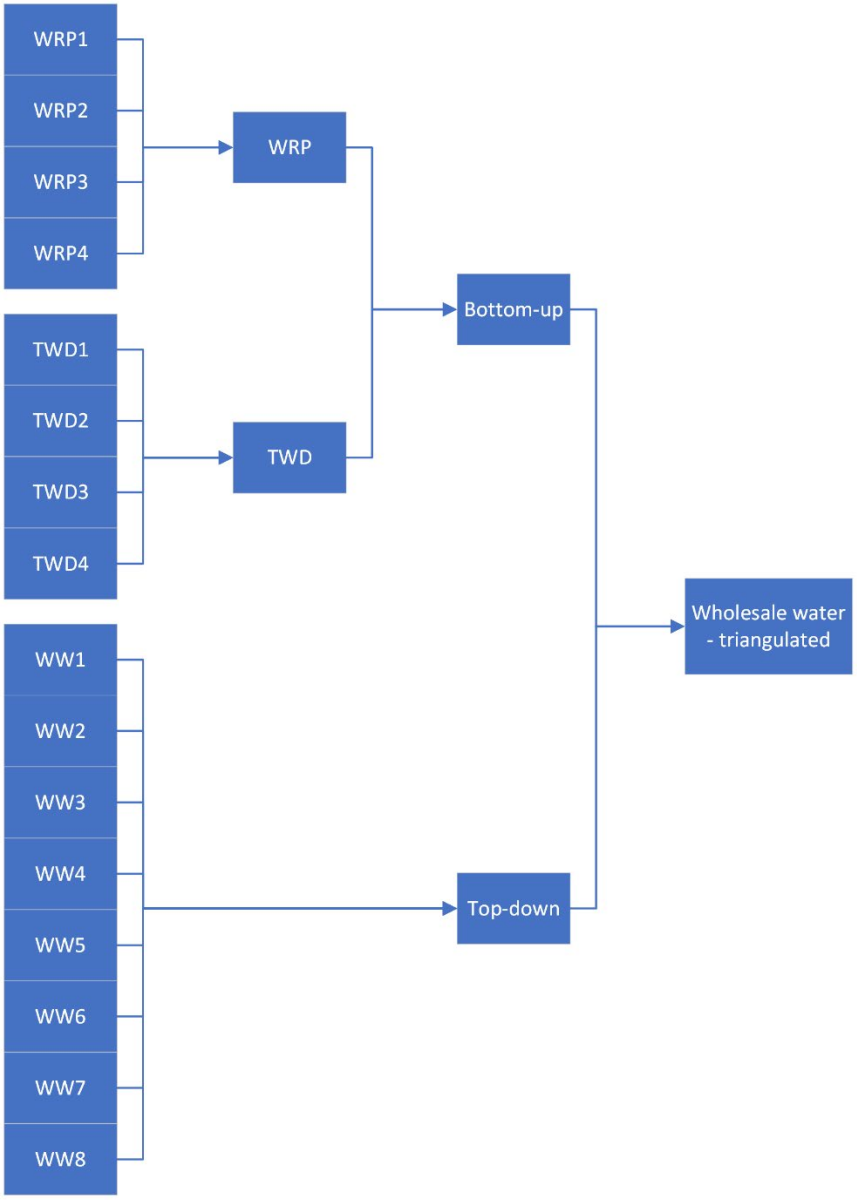
- Benchmarking the costs of the returning PFI assets.

## 3.2. Wholesale water operating expenditure models

3.2.1. We have developed four water resources plus (WRP) models, four treated water distribution (TWD) models and eight wholesale water (WW) models to assess Scottish Water's wholesale water operating expenditure. The models used Ofwat's wholesale water base expenditure models as a starting point. They have been updated to run on an operating expenditure only basis and to take account of Scottish Water's specific circumstances.

3.2.2. The models are disaggregated into each value chain activity to better identify the relationships between costs (dependent variables) and the factors that impact costs (explanatory variables). Figure 10 shows how the models are aggregated, with arrows indicating the average of each model's outputs, weighted equally, to produce a single triangulated output.

*Figure 10: Wholesale water models mapping*




3.2.3. The models work by establishing statistical relationships between costs (dependent variables) and the factors that impact costs (explanatory variables). We cover both areas in turn.

### Dependent variables

3.2.4. We have worked with Scottish Water to identify the expenditure (dependent variables) for the companies in England and Wales to ensure consistency with Scottish Water's operating expenditure. We used three criteria to decide if an item of expenditure should be included:

1. Is the variable operating expenditure?
2. Does Scottish Water undertake this activity and incur these costs?
3. Is the variable and expenditure material for the companies in England and Wales?

3.2.5. Table 96 shows the selected variables based on these criteria and following discussion with Scottish Water.

*Table 96: Dependent variables for the water models*

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| | *Water resources* | | | |
| WS01001WR | Power | + | ✓ | |
| WS01002WR | Income treated as negative expenditure | + | ✓ | |
| WS01004WR | Bulk supply | + | ✓ | |
| BM339IWR | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM339NIWR | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM339OWR | Other operating expenditure excluding renewals | + | ✓ | |
| WS1012WR | Maintaining the long term capability of the assets – infra | + | × | 1 |
| WS1013WR | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| W3002WR | Addressing low pressure | + | × | 3 |
| BN4012_WR | Atypical expenditure base adjustment | + | × | 3 |
| W3032WR | Statutory water softening | - | ✓ | |
| W3036WR | Costs associated with Traffic Management Act | - | × | 3 |
| CRT5100 | Canal and River Trust Costs | - | ✓ | |
| | *Treated water distribution* | | | |
| BM202TWD | Power | + | ✓ | |
| BM336TWD | Income treated as negative expenditure | + | ✓ | |
| BM240TWD | Bulk supply | + | ✓ | |
| BM339ITWD | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM339NITWD | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM339OWD | Other operating expenditure excluding renewals | + | ✓ | |
| BC30445TWD | Maintaining the long term capability of the assets - infra | + | × | 1 |

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| CW00036TWD | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| W3002TWD | Addressing low pressure | + | × | 1 |
| BN4012_TWD | Atypical expenditure base adjustment | + | × | 2 |
| BN202LEAKADJTWD | APR reallocation from enhancement to base - leakage | + | × | 2 |
| W3032TWD | Costs associated with Traffic Management Act | - | × | 2 |
| W3036TWD | Statutory water softening | - | × | 2 |
| APP28RR_W0002 | Diversions expenditure - water NRSWA | - | × | 3 |
| APP28RR_W0003 | Diversions expenditure - water Other non-s185 | - | × | 3 |
| B0201DSWADJ | Developer services base cost adjustment - water | - | × | 1 |
| | *Wholesale water* | | | |
| WS1001CAW | Power | + | ✓ | |
| WS01002CAW | Income treated as negative expenditure | + | ✓ | |
| WS01004CAW | Bulk supply | + | ✓ | |
| BM339ICAW_20 | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM339NICAW_20 | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM339OCAW_20 | Other operating expenditure excluding renewals | + | ✓ | |
| WS1012CAW | Maintaining the long term capability of the assets - infra | + | × | 1 |
| WS1013CAW | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| W3002CAW_20 | Addressing low pressure | + | × | 1 |
| BN4012_WW | Atypical expenditure base adjustment | + | × | 2 |
| BN202LEAKADJTWD | APR reallocation from enhancement to base - leakage | + | × | 2 |
| W3032TOT | Costs associated with Traffic Management Act | - | × | 2 |
| W3036CAW_20 | Statutory water softening | - | ✓ | |
| APP28RR_W0002 | Diversions expenditure - water NRSWA | - | × | 3 |

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| APP28RR_W0003 | Diversions expenditure - water Other non-s185 | - | × | 3 |
| B0201DSWADJ | Developer services base cost adjustment - water | - | × | 1 |
| CRT5100 | Canal and River Trust Costs | - | ✓ | |
| | *Botex plus* | | | |
| B0201DSITDWNC | Infrastructure network reinforcement - Capex - Treated water distribution | + | × | 1 |
| B0201DSITDWNO | Infrastructure network reinforcement - Opex - Treated water distribution | + | × | 1 |

3.2.6. There are two variables that may warrant further explanation for their inclusion. W3036 'Statutory water softening' has been removed from the cost base as Scottish Water has limited water softening requirements, so their removal allows for a better comparison to the England and Wales companies' operating expenditure. Similarly, CRT5100 'Canal and River Trust Costs' has been removed from the cost base, as it is only incurred by Bristol Water.

### Explanatory variables

3.2.7. The cost drivers[160] for wholesale water operating expenditure in the models are scale, treatment complexity, network topography and population density. Table 97 shows which explanatory variables are used in each model.

*Table 97: Wholesale water models explanatory variables*

| Model | Scale | Treatment complexity | Network topography | Population density |
|---|---|---|---|---|
| WRP1 | Number of properties | Proportion of water treated at complexity levels from 3 to 6 | N/A | Weighted average density |
| WRP2 | Number of properties | Weighted average treatment complexity | N/A | Weighted average density |
| WRP3 | Number of properties | Proportion of water treated at complexity levels from 3 to 6 | N/A | Properties per length of mains |

[160] Cost drivers are the general factors that impact costs (e.g. scale of the network) whereas explanatory factors are the specific measures used to capture the cost drivers in the models (e.g. number of properties connected to the network).

| Model | Scale | Treatment complexity | Network topography | Population density |
|---|---|---|---|---|
| WRP4 | Number of properties | Weighted average treatment complexity | N/A | Properties per length of mains |
| TWD1 | Length of mains | N/A | Number of booster pumping stations per length of mains | Weighted average density |
| TWD2 | Length of mains | N/A | Number of booster pumping stations per length of mains | Properties per length of mains |
| TWD3 | Length of mains | N/A | Capacity of booster pumping stations per length of mains | Weighted average density |
| TWD4 | Length of mains | N/A | Capacity of booster pumping stations per length of mains | Properties per length of mains |
| WW1 | Number of properties | Proportion of water treated at complexity levels from 3 to 6 | Number of booster pumping stations per length of mains | Weighted average density |
| WW2 | Number of properties | Weighted average treatment complexity | Number of booster pumping stations per length of mains | Weighted average density |
| WW3 | Number of properties | Proportion of water treated at complexity levels from 3 to 6 | Number of booster pumping stations per length of mains | Properties per length of mains |
| WW4 | Number of properties | Weighted average treatment complexity | Number of booster pumping stations per length of mains | Properties per length of mains |
| WW5 | Number of properties | Proportion of water treated at complexity levels from 3 to 6 | Capacity of booster pumping stations per length of mains | Weighted average density |
| WW6 | Number of properties | Weighted average treatment complexity | Capacity of booster pumping stations per length of mains | Weighted average density |
| WW7 | Number of properties | Proportion of water treated at complexity levels from 3 to 6 | Capacity of booster pumping stations per length of mains | Properties per length of mains |
| WW8 | Number of properties | Weighted average treatment complexity | Capacity of booster pumping stations per length of mains | Properties per length of mains |

*Scale*

3.2.8. The WRP and WW models use the number of properties (household plus non-household) as the measure of company scale, and the TWD models use the length of potable water mains. Both variables are easily comparable on a like-for-like basis between Scottish Water and the companies in England and Wales, and both variables are statistically significant at the 1% level in the models.[161]

*Treatment complexity*

3.2.9. The WRP and WW models use the proportion of water treated at complexity levels from 3 to 6 and the weighted average treatment complexity as measures of treatment complexity.

3.2.10. Scottish Water reports treatment complexity by the bands, simple disinfection, W1, W2, W3 and W4. The companies in England and Wales use the bands W0 to W6. Simple disinfection has the same definition as W0 in England and Wales, and W1-W3 have the same definition in both Scotland and England and Wales. W4 in Scotland aligns with W4-W6 in England and Wales. Table 98 shows the definitions of water treatment complexity levels in England and Wales and Scotland.

[161] The statistical significance of a variable gives the confidence in the value of the variable. The lower the statistical significance, the higher the level of confidence. This is measured through the p-value of the variable. A p-value of 20% or even 30% may be deemed valid in practical work.

*Table 98: Water treatment complexity levels and definitions*

| England and Wales complexity level | Definition[162] | Scotland complexity level | Definition[163] |
|---|---|---|---|
| W0 | Works providing simple disinfection only | W0 | Works providing simple disinfection only |
| W1 | Simple disinfection plus simple physical treatment and/or blending only | W1 | Simple disinfection plus simple physical treatment only |
| W2 | Single stage complex physical or chemical treatment | W2 | Single stage complex physical or chemical treatment |
| W3 | More than one stage of complex treatment but excluding processes in W4, W5 or W6 | W3 | More than one stage of complex treatment, but excluding processes in W4 |
| W4 | Single stage complex physical or chemical treatment with significantly higher operating costs than in W2/ W3 | W4 | This category is intended to capture processes with very high operating costs |
| W5 | More than one stage of complex, high cost treatment | | |
| W6 | Works with one or more very high cost processes | | |

3.2.11. The proportion of water treated at complexity levels from W3-W6 relates to categories W3-W4 in Scotland, and W3-W6 in England and Wales.

3.2.12. The values of the weighted-average treatment complexity measure may differ slightly between Scotland and England and Wales due to the additional treatment categories in England and Wales. This is due to the water treated at levels W5 and W6 having a higher weighting than W4, and therefore contributing more to the weighted average. However, we do not expect this to have a material impact on the model results.

3.2.13. Both variables are statistically significant at the 5% level in the models.

[162] Ofwat (2025), 'RAG 4.13 – Guideline for the table definitions in the annual performance report', March 2025, p.123.
[163] WICS (2025), 'Annual Return Reporting Requirements Section E Definitions, November 2025, p.25.

*Network topography*

3.2.14. The TWD and WW models use the number of booster pumping stations per length of mains and the capacity of booster pumping stations per length of mains as measures of network topography.

3.2.15. The number of booster pumping stations per length of mains is easily comparable on a like-for-like basis between Scottish Water and the companies in England and Wales, and it is statistically significant at the 5% level in the models, apart from in one of the TWD models, where it has a p-value of 28.5%. WICS considers this acceptable in the models. The number of booster pumping stations per length of mains has a strong engineering and economic rationale and produces a coefficient of the expected sign and magnitude. It is statistically significant in the other TWD model and in all of the WW models. Additionally, it aligns with other statistically insignificant explanatory variables used by other regulators.[164]

3.2.16. The capacity of booster pumping stations per length of mains is a new measure compared to Ofwat's base cost modelling. Ofwat used TWD average pumping head (APH); however, this variable is not statistically significant in WICS's operating expenditure models. The reason for using the capacity of booster pumping stations per length of mains is that we recognise the strong engineering and economic rationale of TWD APH, and the capacity of booster pumping stations per length of mains acts as a reasonable proxy. Table 99 shows the correlations between TWD APH, capacity of booster pumping stations per length of mains and number of booster pumping stations per length of mains. A correlation of 1 means that the two variables move together perfectly in a linear manner.

*Table 99: Network topography variable correlation matrix*

| | Boosters per length (log) | TWD APH (log) | Booster capacity per length (log) |
|---|---|---|---|
| Boosters per length (log) | - | 0.307 | 0.076 |
| TWD APH (log) | 0.307 | - | 0.635 |
| Booster capacity per length (log) | 0.076 | 0.635 | - |

3.2.17. The capacity of booster pumping stations per length of mains is strongly correlated with TWD APH, with a correlation of 0.635, but is not correlated with the number of booster pumping stations per length of mains, with a correlation of 0.076. Given the strong correlation, it is reasonable to assume that the capacity of booster pumping stations per length of mains is driving the same costs that TWD APH is driving in Ofwat's base models. Additionally, as capacity and number of booster pumping stations per length of mains are

[164] Ofgem (2025), 'RIIO-3 Draft Determinations – Electricity Transmission', 1 July 2025, p.184.

not correlated, it is likely that they are driving separate costs in the modelling and that the two variables are capturing topography in different ways. As such, we are confident in the use of the capacity of booster pumping stations per length of mains and the number of booster pumping stations per length of mains. The capacity of booster pumping stations per length of mains is statistically significant at the 5% level in the models.

*Population density*

3.2.18. The WRP, TWD and WW all use population density as an explanatory variable. This is captured through two variables: properties per length of mains and weighted-average density at the local authority level. A squared density variable of the respective density variable used in each model is also included to capture the higher operating costs associated with high density, such as longer travel times for operational staff to fulfil their role (e.g., site visits, responding to incidents) due to congestion.

3.2.19. Properties per length of mains are comparable on a like-for-like basis between Scottish Water and the companies in England and Wales. Properties per length of mains and its squared term are statistically significant at the 10% level in the WRP and WW models. In the TWD models, the p-values are 45% and 38%. However, there are reasons for its inclusion. Similar to the number of booster pumping stations per length of mains, properties per length of mains has engineering and economic rationale, produces a coefficient of the expected sign and magnitude, is statistically significant in the WW models, and aligns with other statistically insignificant explanatory variables used by other regulators. Additionally, properties per length of mains and its squared terms are jointly significant in the TWD models. While neither the linear nor the squared terms are individually significant, together they sufficiently explain variations in costs.

3.2.20. Weighted average density weights population density by the population of an area. Ofwat generated these variables in its base modelling using geographical areas from the 2021 Census, Local Authority Districts (LADs) and Middle layer Super Output Areas (MSOAs). However, the geographical areas used in Scotland for the 2021 Census differ from those in England and Wales. We have used council areas and intermediate zones (in the wastewater collection and treatment and bioresources models) for Scottish Water. While not fully aligned, it is broadly equivalent to the respective geographical areas being used for similar purposes in the different countries. The population and area data for council areas and intermediate zones are sourced from the National Records of Scotland and the Scottish Government respectively.[165] [166]

3.2.21. We have used a weighted average density, weighted by LAD, in the water models. We note that Ofwat used both weighted-average density, weighted by LAD, and weighted-average

[165] National records of Scotland (2025), 'Mid-2024 population estimates', 14 August 2025.
[166] Scottish Government (2020), 'Land Area (based on 2011 Data Zones)', 24 August 2020.

density, weighted by MSOA, in its base expenditure models. We have excluded the weighted-average density variable, weighted by MSOA, from the water models. In its final business plan, Scottish Water explained that this variable does not accurately reflect the density of its operational area and therefore does not reflect its higher costs of serving a more sparsely populated area compared to companies in England and Wales. Our analysis excludes the models that use this particular measure of density to better reflect Scottish Water's circumstances, which also improves the statistical significance of the models.

3.2.22. The weighted average density, weighted by LAD, is statistically significant at the 5% level in the WRP models and in two of the four WW models. In the TWD models, it has p-values of 24% and 35%, and in two WW models, it has p-values of 15% and 22%. WICS considers this acceptable for modelling. Weighted average density has an engineering and economic rationale, produces a coefficient with the expected sign and magnitude, is statistically significant in the WW models, and aligns with other statistically insignificant explanatory variables used by other regulators. Similarly to properties per length of mains, weighted average density and its squared term are jointly significant in the TWD and WW models.[167]

### Wholesale water operating expenditure model

3.2.23. Table 100 shows a summary of our wholesale water operating expenditure models.

[167] Joint significance is when a group of explanatory variables collectively has a significant effect on the dependent variable.

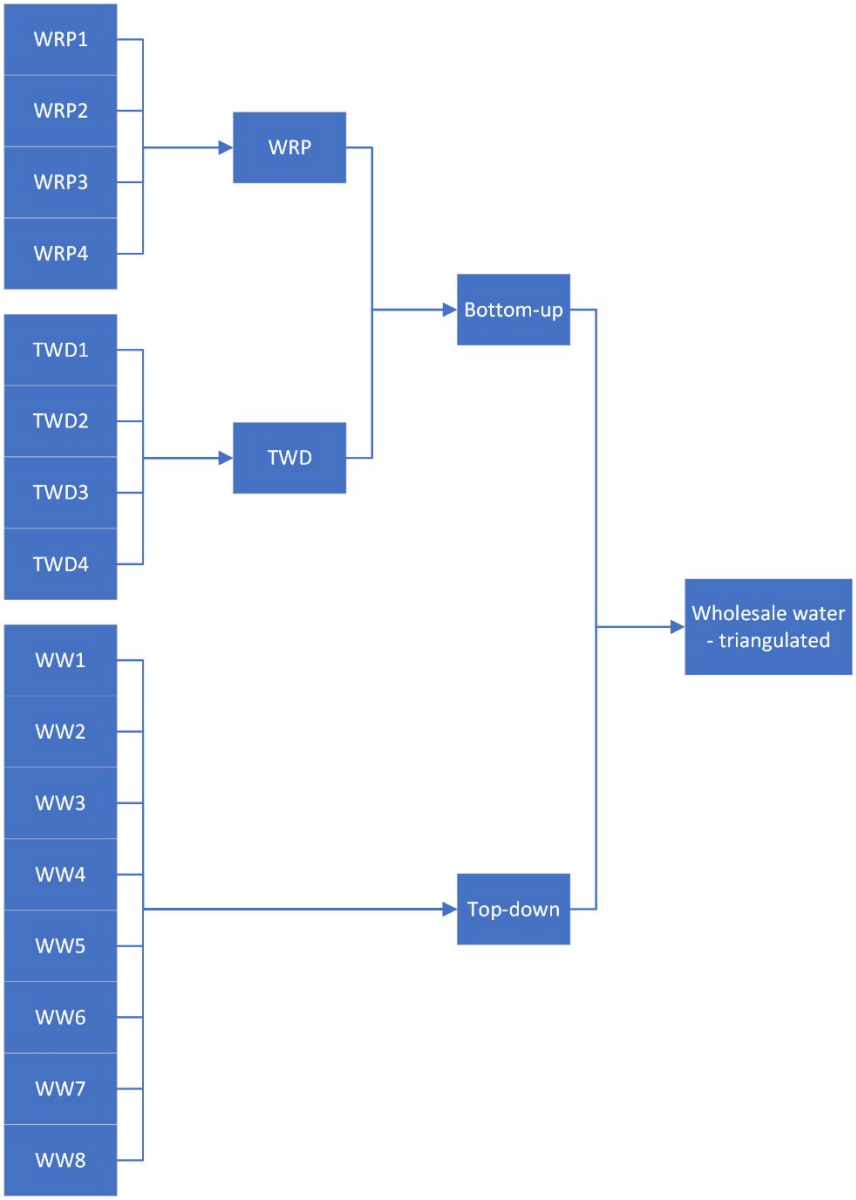
*Table 100: Wholesale water operating expenditure models summary*

| Level of cost aggregation | Cost drivers | Explanatory variables |
|---|---|---|
| Water resources and treatment (4 models) | Scale | • Number of properties (4 models) |
| | Treatment complexity | • Proportion of water treated at complexity levels from 3 to 6 (2 models)<br>• Weighted average treatment complexity (2 models) |
| | Population density | • Weighted average density LAD + squared term (2 models)<br>• Properties per length of mains + squared term (2 models) |
| Treated water distribution (4 models) | Scale | • Length of mains (4 models) |
| | Network topography | • Number of booster pumping stations per length of mains (2 models)<br>• Capacity of booster pumping stations per length of mains (2 models) |
| | Population density | • Weighted average density LAD + squared term (2 models)<br>• Properties per length of mains + squared term (2 models) |
| Wholesale water (8 models) | Scale | • Number of properties (8 models) |
| | Treatment complexity | • Proportion of water treated at complexity levels from 3 to 6 (4 models)<br>• Weighted average treatment complexity (4 models) |
| | Network topography | • Number of booster pumping stations per length of mains (4 models)<br>• Capacity of booster pumping stations per length of mains (4 models) |
| | Population density | • Weighted average density LAD + squared term (2 models)<br>• Properties per length of mains + squared term (4 models) |

3.2.24. All models are consistent with engineering, operational and economic rationale, and all estimated coefficients on the explanatory variables are of the expected sign and plausible magnitude.

3.2.25. The models have been triangulated in line with best practice. A 50% weighting is applied to the WRP plus TWD models, and a 50% weighting is applied to the WW models. Each model within WRP, TWD and WW is equally weighted. Figure 11 shows how the models are combined, with arrows indicating averaging to yield a single triangulated value for a company's predicted expenditure.

*Figure 11: Wholesale water models mapping*




3.2.26. Table 102 to Table 105 shows the model results and the model robustness tests for the wholesale water models. Asterisks have been used to denote explanatory variable significance. Table 101 shows the levels of significance as defined by p-value.

*Table 101: Explanatory variable significance definitions*

| Significance | P-value greater than | P-value less than or equal to |
|---|---|---|
| *** | - | 0.01 |
| ** | 0.01 | 0.05 |
| * | 0.05 | 0.1 |
| | 0.1 | - |

*Table 102: Water resources plus model results and robustness tests*

| | WRP1 | WRP2 | WRP3 | WRP4 |
|---|---|---|---|---|
| Connected properties (log) | 1.060***<br>{0.000} | 1.053***<br>{0.000} | 1.002***<br>{0.000} | 0.996***<br>{0.000} |
| Water treated at complexity levels 3 to 6 (%) | 0.006***<br>{0.000} | | 0.006***<br>{0.000} | |
| Weighted average treatment complexity (log) | | 0.584**<br>{0.041} | | 0.615**<br>{0.018} |
| Weighted average density - LAD (log) | -1.371**<br>{0.010} | -1.234**<br>{0.026} | | |
| Weighted average density - LAD (log) – squared | 0.087**<br>{0.016} | 0.077**<br>{0.039} | | |
| Properties per length (log) | | | -6.040*<br>{0.057} | -5.560*<br>{0.071} |
| Properties per length (log) – squared | | | 0.676*<br>{0.069} | 0.615*<br>{0.085} |
| Constant | -6.193***<br>{0.001} | -6.929***<br>{0.001} | 2.747<br>{0.683} | 1.483<br>{0.822} |
| Adjusted R squared | 0.941 | 0.939 | 0.941 | 0.94 |
| RESET test | 0.360 | 0.421 | 0.471 | 0.500 |
| Normality of model residuals | 0 | 0.016 | 0 | 0.003 |
| Heteroskedasticity of model residuals | 0 | 0 | 0 | 0 |

*Table 103: Treated water distribution model results and robustness tests*

| | TWD1 | TWD2 | TWD3 | TWD4 |
|---|---|---|---|---|
| Length of mains (log) | 0.954*** {0.000} | 0.986*** {0.000} | 0.926*** {0.000} | 0.943*** {0.000} |
| Number of booster pumping stations per length of mains (log) | 0.284 {0.285} | 0.565** {0.032} | | |
| Capacity of booster pumping stations per length of mains (log) | | | 0.234*** {0.000} | 0.191*** {0.001} |
| Weighted average density - LAD (log) | -1.828 {0.242} | | -1.294 {0.354} | |
| Weighted average density - LAD (log) - squared | 0.159 {0.155} | | 0.114 {0.258} | |
| Properties per length (log) | | -9.617 {0.445} | | -10.465 {0.379} |
| Properties per length (log) - squared | | 1.342 {0.368} | | 1.368 {0.334} |
| Constant | 0.698 {0.884} | 13.243 {0.610} | -1.834 {0.689} | 14.294 {0.565} |
| Adjusted R squared | 0.880 | 0.883 | 0.896 | 0.902 |
| RESET test | 0.056 | 0.003 | 0.082 | 0.002 |
| Normality of model residuals | 0.009 | 0 | 0 | 0 |
| Heteroskedasticity of model residuals | 0.472 | 0.427 | 0.330 | 0.138 |

*Table 104: Wholesale water model results and robustness tests (1)*

| | WW1 | WW2 | WW3 | WW4 |
|---|---|---|---|---|
| Connected properties (log) | 1.006*** {0.000} | 0.994*** {0.000} | 0.983*** {0.000} | 0.975*** {0.000} |
| Water treated at complexity levels 3 to 6 (%) | 0.005*** {0.000} | | 0.005*** {0.000} | |
| Weighted average treatment complexity (log) | | 0.555** {0.017} | | 0.562*** {0.002} |
| Number of booster pumping stations per length of mains (log) | 0.331** {0.047} | 0.337** {0.038} | 0.331*** {0.001} | 0.314*** {0.004} |
| Capacity of booster pumping stations per length of mains (log) | | | | |
| Weighted average density - LAD (log) | -1.141** {0.030} | -0.918** {0.037} | | |
| Weighted average density - LAD (log) - squared | 0.082** {0.021} | 0.066** {0.027} | | |
| Properties per length (log) | | | -8.032*** {0.007} | -7.249*** {0.007} |
| Properties per length (log) – squared | | | 0.954*** {0.007} | 0.854*** {0.007} |
| Constant | -4.603** {0.012} | -5.570*** {0.001} | 8.654 {0.158} | 6.756 {0.220} |
| Adjusted R squared | 0.965 | 0.966 | 0.967 | 0.968 |
| RESET test | 0.049 | 0.063 | 0.008 | 0.011 |
| Normality of model residuals | 0.007 | 0.066 | 0.032 | 0.174 |
| Heteroskedasticity of model residuals | 0 | 0 | 0.074 | 0.013 |

*Table 105: Wholesale water model results and robustness tests (2)*

| | WW5 | WW6 | WW7 | WW8 |
|---|---|---|---|---|
| Connected properties (log) | 0.992*** {0.000} | 0.983*** {0.000} | 0.960*** {0.000} | 0.955*** {0.000} |
| Water treated at complexity levels 3 to 6 (%) | 0.005*** {0.002} | | 0.005*** {0.000} | |
| Weighted average treatment complexity (log) | | 0.489* {0.056} | | 0.490** {0.024} |
| Number of booster pumping stations per length of mains (log) | | | | |
| Capacity of booster pumping stations per length of mains (log) | 0.147*** {0.000} | 0.134*** {0.007} | 0.139*** {0.000} | 0.122** {0.012} |
| Weighted average density - LAD (log) | -1.011 {0.183} | -0.863 {0.220} | | |
| Weighted average density - LAD (log) - squared | 0.068 {0.200} | 0.057 {0.245} | | |
| Properties per length (log) | | | -8.629** {0.020} | -8.033** {0.034} |
| Properties per length (log) - squared | | | 0.990** {0.025} | 0.917** {0.040} |
| Constant | -6.017** {0.030} | -6.740** {0.010} | 9.452 {0.224} | 7.939 {0.314} |
| Adjusted R squared | 0.962 | 0.961 | 0.967 | 0.967 |
| RESET test | 0.049 | 0.070 | 0.007 | 0.012 |
| Normality of model residuals | 0.019 | 0.115 | 0.139 | 0.308 |
| Heteroskedasticity of model residuals | 0 | 0 | 0.418 | 0.266 |

## 3.3. Wastewater collection and treatment operating expenditure

3.3.1. We have developed three sewage collection (SWC) models and two sewage treatment (SWT) models to assess Scottish Water's wastewater operating expenditure for wastewater collection and treatment activities (equivalent to 'network plus' in England and Wales). The models used Ofwat's wastewater network plus base expenditure models as a starting point. They have been updated to run on an operating-expenditure-only basis. This approach matches how Scottish Water assessed wastewater collection and treatment models. We have used an additional year of data, 2024-25, for Scottish Water and the companies in England and Wales, which were not available at the time of Scottish Water's final business plan. The models used Ofwat's wastewater 'network plus' base expenditure models as a starting point, recognising that these cover wastewater collection and treatment activities. They have been updated to run on an operating expenditure only basis and to take account of Scottish Water's specific circumstances.

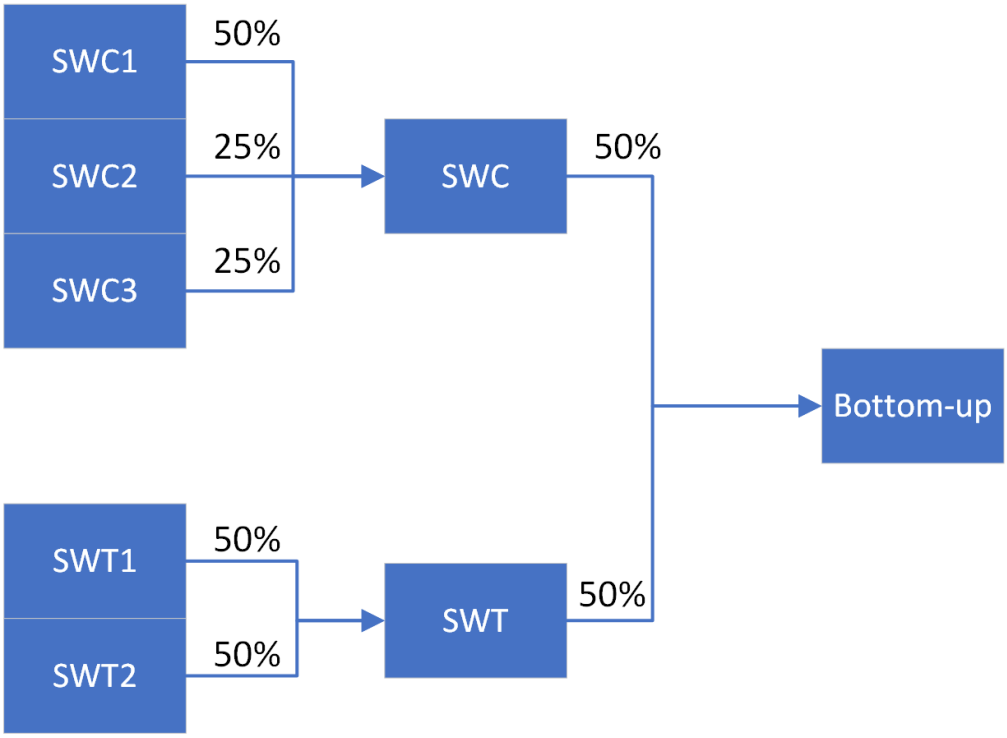
3.3.2. We have excluded septic tanks and the associated costs from the models. Scottish Water's wastewater collection system includes 1177 septic tanks, a significantly larger number than those of any of the companies in England and Wales. We have excluded this to ensure that Scottish Water remains comparable with the companies in England and Wales. This is consistent with WICS treatment of septic tanks in benchmarking in previous SRCs.

3.3.3. We have excluded the costs and associated explanatory variables of the PFI works from the wastewater collection and treatment models. The operation and contract costs of the PFI works sit outside of Scottish Water's control. Removing them ensures that any cost differences in the models are due to management action.

3.3.4. We have not used the 'top-down' wastewater network plus models that are present in Ofwat's base expenditure models. This is a consequence of the PFI contracts operating several wastewater treatment works and bioresource facilities for Scottish Water. The PFI works account for 0.3% of Scottish Water's sewer length and 38% of its load, which has a significant impact on the 'top-down' wastewater network plus models. As the 'top-down' models use load as the scale variable to cover both sewage collection and treatment, they are underestimating the sewer length of Scottish Water's network. In other words, the models are not capturing the sewers that take the load to the PFI works. This results in the models giving a predicted expenditure that is not comparable to Scottish Water's operating circumstances. As such, we are using the SWC plus SWT models for our assessment.

3.3.5. The models are disaggregated into each value chain activity to better identify the relationships between costs (dependent variables) and the factors that impact costs (explanatory variables). Figure 12 shows how the models are aggregated, with arrows indicating the average of each model's outputs weighted by the corresponding weight, to produce a single output.

*Figure 12: Wastewater collection and treatment model mapping*




3.3.6. The models work by establishing statistical relationships between costs (dependent variables) and the factors that impact costs (explanatory variables). We cover both areas in turn.

### Dependent variables

3.3.7. As for the water models above, we worked with Scottish Water to identify the dependent variables that we would use in the wastewater collection and treatment models. The same criteria were used to select the relevant dependant variables, which are:

1. Is the variable operating expenditure?
2. Does Scottish Water undertake this activity and incur these costs?
3. Is the variable and expenditure material for the companies in England and Wales?

3.3.8. Table 106 shows the dependent variables that were selected.

*Table 106: Dependent variables for the wastewater collection and treatment models*

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| | *Sewage collection* | | | |
| BM402SC | Power | + | ✓ | |
| BM836SC | Income treated as negative expenditure | + | ✓ | |

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| BM140SC | Bulk discharge | + | ✓ | |
| BM839ISC | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM839NISC | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM839OSC | Other operating expenditure excluding renewals | + | ✓ | |
| BC30945SC | Maintaining the long term capability of the assets – infra | + | × | 1 |
| CS00036SC | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| S3024SC | Transferred private sewers and pumping stations | + | × | 2 |
| BN4012_SWC | Atypical expenditure base adjustment | + | × | 3 |
| W3032NPSC | Costs associated with Traffic Management Act | - | × | 2 |
| W3036NPSC | Costs associated with Industrial Emissions Directive | - | × | 2 |
| APP28RR_WW0002 | Diversions expenditure - wastewater NRSWA | - | × | 3 |
| APP28RR_WW0003 | Diversions expenditure - wastewater Other non-s185 | - | × | 3 |
| B0201DSWWADJ | Developer services base cost adjustment | - | × | 1 |
| | *Sewage treatment* | | | |
| BM502ST | Power | + | ✓ | |
| BM836ST | Income treated as negative expenditure | + | ✓ | |
| BM140ST | Bulk discharge | + | ✓ | |
| BM839IST | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM839NIST | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM839OST | Other operating expenditure excluding renewals | + | ✓ | |
| BC30945ST | Maintaining the long term capability of the assets – infra | + | × | 1 |
| CS00036ST | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| S3024ST | Transferred private sewers and pumping stations | + | × | 2 |

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| BN4012_SWT | Atypical expenditure base adjustment | + | × | 3 |
| W3032NPST | Costs associated with Traffic Management Act | - | × | 2 |
| W3036NPST | Costs associated with Industrial Emissions Directive | - | × | 2 |
| BN5000 | BACKCAST | - | × | 2 |
| B0312CRO_SWT | Enhancement opex - chemical removals | + | ✓ | |
| B0318NRO_SWT | Enhancement opex - nitrogen removal | + | ✓ | |
| B0321PRO_SWT | Enhancement opex - phosphorus removal | + | × | 2 |
| B0324RSO_SWT | Enhancement opex - reduction of sanitary parameters | + | ✓ | |
| B0327UVO_SWT | Enhancement opex - UV disinfection (or similar) | + | ✓ | |

3.3.9. The four enhancement operating expenditure variables B0312CRO_SWT, B0318NRO_SWT, B0324RSO_SWT and B0327UVO_SWT have been included, as, from discussions with Scottish Water, it seems likely that Scottish Water incurred similar costs in their operating expenditure. However, B0321PRO_SWT 'Enhancement opex - phosphorus removal' has been removed.

### Explanatory variables

3.3.10. The cost drivers for wastewater collection and treatment in the models are scale, economies of scale in sewage treatment works, treatment complexity, network topography and population density and urban rainfall. Table 107 shows the explanatory variables used in each model.

*Table 107: Wastewater collection and treatment explanatory variables*

| Model | Scale | Economies of scale in sewage treatment works | Treatment complexity | Network topography | Population density | Urban rainfall |
|---|---|---|---|---|---|---|
| SWT1 | Sewer length | N/A | N/A | Pumping capacity per sewer length | Properties per sewer length | Urban rainfall per sewer length |
| SWT2 | Sewer length | N/A | N/A | Pumping capacity per sewer length | Weighted average density at the local authority level | Urban rainfall per sewer length |
| SWC3 | Sewer length | N/A | N/A | Pumping capacity per sewer length | Weighted average density at the MSOA level | Urban rainfall per sewer length |
| SWT1 | Load | Percentage of load treated in STWs serving less than 2,000 people (bands 1 to 3) | Percentage of load with ammonia permit <= 3mg/l | N/A | N/A | N/A |
| SWT2 | Load | Weighted average sewage treatment works size (WATS) | Percentage of load with ammonia permit <= 3mg/l | N/A | N/A | N/A |

### *Scale*

3.3.11. The SWC models use sewer length as the measure of company scale and the SWT models use load. Both variables are easily comparable between Scottish Water and the companies in England and Wales, and both variables are statistically significant at the 1% level in the models.

*Economies of scale in sewage treatment works*

3.3.12. The SWT models use the percentage of load treated in STWs serving fewer than 2,000 people (bands 1 to 3) and the weighted-average sewage treatment works size (WATS) as measures of economies of scale in sewage treatment works.

3.3.13. Scottish Water uses the same definition for size bands of average daily load as the companies in England and Wales, with the exception of an additional size band 0 (defined as less than or equal to 6kg BOD5/day). For Scottish Water, size bands 0 and 1 can be combined, and both variables can then be calculated on a like-for-like basis with the companies in England and Wales.

3.3.14. Both variables are statistically significant at the 1% level in the models.

*Treatment complexity*

3.3.15. The SWT models use the percentage of load with ammonia permit <= 3mg/l as the measure of treatment complexity.

3.3.16. The annual return collects data for large and small treatment works in different tables. A combination of both is used to calculate use percentage of load with ammonia permit <= 3mg/l. For large treatment works, the annual return collects the ammonia consent on a site-by-site basis and collects load on a Population Equivalent (PE) basis. The large treatment works with an ammonia permit <= 3mg/l were selected and a conversion factor of 1 PE equalling 60kg BOD5/day was used to convert to the same units as for small treatment works.

3.3.17. The annual return does not collect small sewage treatment works with ammonia consent <= 3mg/l, instead collecting ammonia consent <= 5mg/l. Scottish Water internally calculated a value of 9.6% for the percentage of load with ammonia permit <= 3mg/l for small treatment works. This allows for the total percentage of load with ammonia permit <= 3mg/l to be calculated when combined with the values for the large treatment works.

3.3.18. The percentage of load with ammonia permit <= 3mg/l is statistically significant at the 1% level in the models.

*Network topography*

3.3.19. The SWC models use pumping capacity per sewer length as the measure of network topography. Pumping capacity per sewer length is easily comparable, on a like-for-like basis, between Scottish Water and companies in England and Wales.

3.3.20. Pumping capacity per sewer length is statistically significant at the 5% level in two out of three of the SWC models. In the third, the p-value is 13%. WICS considers this to be

acceptable, given that this is within the 80% statistical significance deemed valid in practical work, pumping capacity per sewer length has engineering and economic rationale, and it produces a coefficient of the expected sign and magnitude.

### *Population density*

3.3.21. The SWC models use population density as a cost driver. This is captured through three variables: properties per sewer length, weighted average density at the local authority level and weighted average density at the MSOA level.

3.3.22. Properties per sewer length are easily comparable on a like-for-like basis between Scottish Water and the companies in England and Wales. The properties per sewer length and its squared term are statistically significant at the 1% level in the SWC model that contains them.

3.3.23. Weighted average density at the local authority level and weighted average density at the MSOA level are equal to the same variables in the water models, described in 3.2.19. While the WaSCs in England and Wales have different weighted average densities for water and wastewater due to different operational areas, Scottish Water has a single operational area for both. Weighted average density at the local authority level and at the MSOA level is statistically significant at the 1% level in the SWC models.

### *Urban rainfall*

3.3.24. The SWC models use urban rainfall per sewer length as an explanatory variable. Ofwat generated this variable using the Met Office's HADUK-Grid and overlaying the rainfall onto MSOAs using GIS software. Then the sum of the rainfall on MSOAs designated as urban for each company is taken.

3.3.25. As stated in 3.2.19, Scotland does not use MSOAs but instead uses intermediate zones. As such, we have repeated the above process using intermediate zone boundaries,[168] the Met Office's HADUK-Grid,[169] and the designation of data zones as urban or rural.[170] As the urban designation happens at the data zone level (intermediate zones are made up of data zones), we have designated an intermediate zone to be urban if it contains more or an equal number of urban data zones than rural data zones.

3.3.26. Urban rainfall per sewer length is statistically significant at the 1% level in the SWC models.

[168] Scottish Government (2021), 'Intermediate Zone Boundaries 2011', 4 October 2021.
[169] Met Office (2025), 'HadUK-Grid Gridded Climate Observations on a 1km grid over the UK, v1.3.1.ceda (1836-2024)', 2 July 2025.
[170] Scottish Government (2024), '2011 Data Zone Lookup', 16 December 2024.

### Wastewater collection and treatment operating expenditure models

3.3.27. Table 108 shows a summary of our wastewater collection and treatment operating expenditure models.

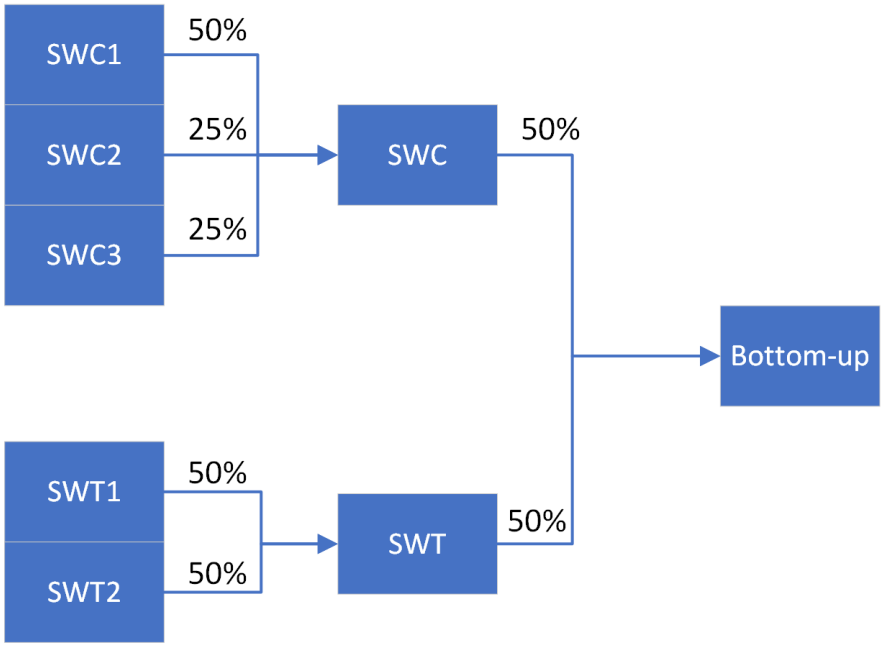
*Table 108: Wastewater collection and treatment operating expenditure models summary*

| Level of cost aggregation | Cost drivers | Explanatory variables |
|---|---|---|
| Sewage collection (3 models) | Scale | • Sewer length (3 models) |
| | Network topography | • Pumping capacity per sewer length (3 models) |
| | Population density | • Properties per sewer length (1 model)<br>• Weighted average density LAD (1 model)<br>• Weighted average density MSOA (1 model) |
| | Urban rainfall | • Urban MSOA rainfall per sewer length (3 models) |
| Sewage treatment (2 models) | Scale | • Load (2 models) |
| | Treatment complexity | • Pumping capacity per sewer length (2 models) |
| | Economies of scale in sewage treatment | • Percentage load treated in size bands 1 to 3 (1 model)<br>• Weighted average treatment size (1 model) |

3.3.28. All models are consistent with engineering, operational and economic rationale, and all estimated coefficients on the explanatory variables are of the expected sign and plausible magnitude.

3.3.29. The models have been triangulated in line with best practice. In SWC, each model containing weighted average density is weighted at 25%, and the model containing properties per length of sewer is weighted at 50%. This gives equal weighting to the two methods of calculating density. Both SWT models are weighted at 50%. Figure 13 shows how the models are combined, with arrows indicating taking a weighted average with the weightings indicated in the Figure, to give one value for a company's predicted expenditure.

*Figure 13: Wastewater collection and treatment models mapping*




3.3.30. Table 109 and Table 110 show the model results and the model robustness tests for the wastewater collection and treatment models.

*Table 109: Sewage water collection model results and robustness tests*

| | SWC1 | SWC2 | SWC3 |
|---|---|---|---|
| Sewer Length (log) | 0.761*** {0.000} | 0.871*** {0.000} | 0.795*** {0.000} |
| Pumping capacity per sewer length (log) | 0.361 {0.134} | 0.655*** {0.008} | 0.588** {0.019} |
| Properties per length (log) | 1.464*** {0.003} | | |
| Weighted average density - LAD (log) | | 0.320*** {0.006} | |
| Weighted average density – MSOA (log) | | | 0.614*** {0.004} |
| Urban rainfall per sewer length (log) | 0.138*** {0.008} | 0.249*** {0.000} | 0.239*** {0.000} |
| Constant | -9.483*** {0.000} | -7.279*** {0.000} | -9.011*** {0.000} |
| Adjusted R squared | 0.805 | 0.797 | 0.775 |
| RESET test | 0.020 | 0.280 | 0.098 |
| Normality of model residuals | 0.833 | 0.706 | 0.79 |
| Heteroskedasticity of model residuals | 0.364 | 0.845 | 0.632 |

*Table 110: Sewage water treatment model results and robustness tests*

| | SWT1 | SWT2 |
|---|---|---|
| Load (log) | 0.693*** {0.000} | 0.616*** {0.000} |
| Load treated with ammonia consent ⩽ 3mg/l (%) | 0.007*** {0.000} | 0.008*** {0.000} |
| Load treated in bands 1-3 (%) | 0.055*** {0.001} | |
| Weighted average treatment size (log) | | -0.138** {0.010} |
| Constant | -4.669*** {0.005} | -2.170* {0.056} |
| Adjusted R squared | 0.840 | 0.824 |
| RESET test | 0.023 | 0.042 |
| Normality of model residuals | 0.001 | 0.004 |
| Heteroskedasticity of model residuals | 0.121 | 0.092 |

## 3.4. Bioresources operating expenditure models

3.4.1. We have not used bioresources models to assess Scottish Water's operating expenditure efficiency on a historical basis. This is because Scottish Water currently treats 25% of the sewage sludge produced in Scotland, with the PFI sites treating the other 75%. We continue to assess whether this is the appropriate approach for Scottish Water's historical expenditure.

3.4.2. However, at the end of the 2027-33 regulatory period, all but one of the PFI sites will have returned to Scottish Water's control. As a result, by the end of SRC27, the PFI sites will only account for 3% of the load and 2% of the sludge produced in Scotland, as shown in Table 111. WICS considers that this allows the operating expenditure associated with the returning PFIs to be benchmarked against companies in England and Wales using both the wastewater collection and treatment and bioresources models.

*Table 111: Percentage of explanatory variables in wastewater and bioresources served by PFI contracts*

| | 2024-25 | 2025-26 | 2026-27 | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 |
|---|---|---|---|---|---|---|---|---|---|
| Sewer length | 0.3% | 0.3% | 0.3% | 0.3% | 0.3% | 0.1% | 0.1% | 0.0% | 0.0% |
| Load | 38% | 38% | 29% | 29% | 29% | 11% | 11% | 9% | 3% |
| Sewage sludge | 75% | 75% | 34% | 34% | 34% | 12% | 12% | 9% | 2% |

3.4.3. WICS notes Scottish Water's comments on the bioresources models.[171] While these comments were made in relation to using the bioresources models on a historical basis, we address Scottish Water's comments on the bioresources model to explain why WICS considers the models appropriate for assessing Scottish Water's proposed costs for operating the returning PFI sites:

- Scottish Water explains that the "vast majority of sludge-related services have been undertaken by PFI providers", and as economies of scale are one of the two key drivers identified by Ofwat, the comparison of Scottish Water's current sludge assets to the companies in England and Wales is not a valid basis for comparison. WICS considers that this point applies only in a historical context and at the end of the 2027-33 regulatory period, when Scottish Water is operating the assets that treat around 98% of Scotland's sludge, the bioresources models will provide a valid comparison.
- Scottish Water explains that the bioresources models treat energy generation income as a negative cost, and this will not be appropriate for the sludge services currently provided by Scottish Water outside of the PFI agreements. WICS has included an adjustment to the efficient benchmark produced by the bioresources models to exclude energy generation income from expenditure calculations. As energy generation income is 20% of costs in England and Wales, we have applied a 25% uplift to the efficient benchmark to account for this.
- Scottish Water explains that "Ofwat's bioresources models are, in any event, highly simplified [and] does not look to provide a sufficient basis to assess the efficiency of Scottish Water's levels of sludge opex". WICS notes that the bioresources models are less complex than the water and wastewater collection and treatment models as the aggregate of four unit cost models; however, this does not make them insufficient.

[171] Scottish Water (2025), 'SR27 Draft Business Plan: Technical Appendix 012 – Efficiency', 12 June 2025, p.81.

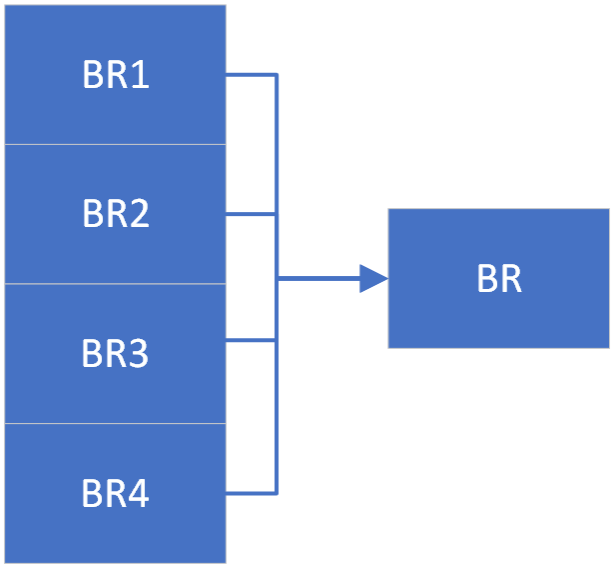
- Scottish Water explains “as relevant PFI contracts come to an end, Scottish Water’s sludge costs have been and will be subject to large percentage step increases because of the size of PFI assets relative to that of those that Scottish Water had/has been operating”. WICS has incorporated the step increases into its analysis, allowing for costs only for the proportion of the year during which the PFI sites return to Scottish Waters control.

3.4.4. We have used four bioresources unit cost models and the above wastewater collection and treatment models above to assess Scottish Water’s proposed operating expenditure to operate the returning PFI sites. The bioresources models used Ofwat’s bioresources base cost models as a starting point. They have been updated to cover only operating expenditure.

3.4.5. We have not included Scottish Water as an observation in the models when generating the coefficients, recognising that the coefficients are generated from historical information from 2011-12 onwards. This approach is consistent with our decision not to use the bioresource models on a historical basis.

3.4.6. Figure 14 shows how the models are aggregated, with arrows indicating the average of each model's outputs, weighted equally.

*Figure 14: Bioresources models mapping*




3.4.7. The models work by establishing statistical relationships between costs (dependent variables) and the factors that impact costs (explanatory variables). We cover both areas in turn.

### Dependent variables

3.4.8. The same criteria for the wholesale water and wastewater collection and treatment models were used to select the relevant dependant variables for bioresources, which are:

1. Is the variables operating expenditure?
2. Does Scottish Water undertake this activity and incur these costs?
3. Is the variable and expenditure material for the companies in England and Wales?

3.4.9. Table 112 shows the dependent variables that were selected.

*Table 112: Dependent variables for the bioresources models*

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| BM602STP | Sludge transport – Power | + | ✓ | |
| BM836STP | Sludge transport - Income treated as negative expenditure | + | ✓ | |
| BM140STP | Sludge transport - Bulk discharge | + | ✓ | |
| BM839ISTP | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM839NISTP | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM839OSTP | Sludge transport - Other operating expenditure excluding renewals | + | ✓ | |
| BC30945STP | Maintaining the long term capability of the assets - infra | + | × | 1 |
| CS00036STP | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| BM602SDT | Sludge treatment - Power | + | ✓ | |
| BM836SDT | Sludge treatment - Income treated as negative expenditure | + | ✓ | |
| BM140SDT | Sludge treatment - Bulk discharge | + | ✓ | |
| BM839ISDT | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM839NISDT | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM839OSDT | Sludge treatment - Other operating expenditure excluding renewals | + | ✓ | |
| BC30945SDT | Maintaining the long term capability of the assets - infra | + | × | 1 |
| CS00036SDT | Maintaining the long term capability of the assets - non-infra | + | × | 1 |
| BM602SDD | Sludge disposal - Power | + | ✓ | |

| Code | Name | Sign | Included | Criterion failed |
|---|---|---|---|---|
| BM836SDD | Sludge disposal - Income treated as negative expenditure | + | ✓ | |
| BM140SDD | Sludge disposal - Bulk discharge | + | ✓ | |
| BM839ISDD | Renewals expensed in year (Infrastructure) | + | × | 1 |
| BM839NISDD | Renewals expensed in year (Non-Infrastructure) | + | × | 1 |
| BM839OSDD | Sludge disposal - Other operating expenditure excluding renewals | + | ✓ | |
| BC30945SDD | Maintaining the long term capability of the assets - infra | + | × | 1 |
| CS00036SDD | Maintaining the long term capability of the assets - non-infra | + | × | 1 |

### Explanatory variables

3.4.10. The cost drivers for the bioresources models are economies of scale in sludge treatment, and location of sewage treatment works relative to sludge treatment centres. This is captured through proxy variables of population density and the size of sewage treatment works. Table 113 shows which explanatory variables are used in each model.

*Table 113: Bioresources explanatory variables*

| Model | Population density | Size of sewage treatment works |
|---|---|---|
| BR1 | N/A | Percentage of load treated at band sizes 1 to 3 |
| BR2 | Weighted average density at the local authority level | N/A |
| BR3 | Weighted average density at the MSOA level | N/A |
| BR4 | N/A | Sewage treatment works per property |

#### *Population density*

3.4.11. Population density is captured in the bioresources models by two variables: weighted average density at the local authority level and weighted-average density at the MSOA level. Weighted-average density at the local authority level and weighted-average density at the MSOA level are equal to the same variables in the water and wastewater models, described in 3.2.19.

3.4.12. As the weighted-average density measures are generated using council area and intermediate zone data, these variables do not change as PFI works return to Scottish Water's operations.

3.4.13. The weighted average density at the local authority level and at the MSOA level is statistically significant at the 10% level in the bioresources models.

*Size of sewage treatment works*

3.4.14. The size of sewage treatment works is captured through two variables in the bioresources models: the percentage of load treated at band sizes 1 to 3 and sewage treatment works per property.

3.4.15. The percentage of load treated at band sizes 1 to 3 is generated in the same way as in the wastewater collection and treatment models at the start of SRC27, described in 3.3.10. All PFI works that are to return to Scottish Water's operational control are large sewage treatment works. As such, this value decreases as the PFI works return to Scottish Water's operational control. The percentage of load treated at band sizes 1 to 3 is statistically significant at the 5% level in the bioresources models.

3.4.16. Sewage treatment works per property are comparable on a like-for-like basis between Scottish Water and the companies in England and Wales, and it is statistically significant at the 5% level in the models. It increases marginally during the period as the PFI sewage treatment works are returned to Scottish Water's operational control.

### Bioresources operating expenditure models

3.4.17. Table 114 shows a summary of our bioresources operating expenditure models.

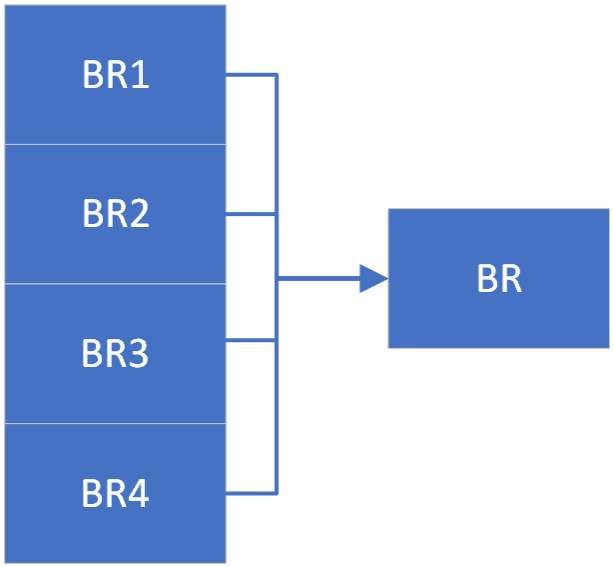
*Table 114: Bioresources operating expenditure models summary*

| Level of cost aggregation | Cost drivers | Explanatory variables |
|---|---|---|
| Bioresources unit cost models (4 models) | Economies of scale in sludge treatment, and location of sewage treatment works relative to sludge treatment centres | • Percentage of load treated at band sizes 1 to 3 (1 model)<br>• Weighted average density LAD (1 model)<br>• Weighted average density MSOA (1 model)<br>• Sewage treatment works per property (1 model) |

3.4.18. All models are consistent with engineering, operational and economic rationale, and all estimated coefficients on the explanatory variables are of the expected sign and plausible magnitude.

3.4.19. The models have been triangulated in line with best practice. Each bioresource model is weighted at 25% to produce a single value for a company's predicted expenditure. Figure 15 shows how the models are combined, with arrows indicating that the average is taken.

*Figure 15: Bioresources models mapping*




3.4.20. Table 115 shows the model results for the bioresources models.

*Table 115: Bioresources models results*

| | BR1 | BR2 | BR3 | BR4 |
|---|---|---|---|---|
| Load treated in bands 1-3 (%) | 0.087***<br>{0.001} | | | |
| Weighted average density - LAD (log) | | -0.613*<br>{0.069} | | |
| Weighted average density – MSOA (log) | | | -1.024*<br>{0.075} | |
| Number of sewage treatment works per property (log) | | | | 0.483**<br>{0.032} |
| Constant | -1.721***<br>{0.000} | 3.028<br>{0.198} | 6.700<br>{0.131} | 2.571<br>{0.142} |

## 3.5. Efficient benchmark

3.5.1. We have described how the models are used to generate a predicted expenditure for wholesale water, wastewater collection and treatment and bioresources. The next step is to establish the efficient benchmark for Scottish Water based on the chosen benchmark for each functional activity.

3.5.2. The predicted expenditure from each model is used to derive an efficiency score for each company in Great Britain. The models use a five-year modelling period to mitigate the impact of atypical expenditure in any one year. As such, the efficiency score is the ratio of the sum

of modelled expenditure (as defined in 3.2.5, 3.3.8 and 3.4.9) from 2020-21 to 2024-25 to the sum of predicted expenditure from 2020-21 to 2024-25.

3.5.3. The sector-wide benchmark is determined as the respective percentile of the distribution of company efficiency scores, in line with the chosen benchmark for each functional activity. The chosen benchmark is the upper-quartile for wholesale water and wastewater collection and treatment, and the median for the bioresources models, as discussed in chapter 6 in the main Draft Determination document. As such the sector-wide benchmark is set at the 25th percentile of company efficiency scores for wholesale water and wastewater collection and treatment for Scottish Water's currently controlled assets and at the 50th percentile for bioresources and wastewater collection and treatment for the returning PFI assets.

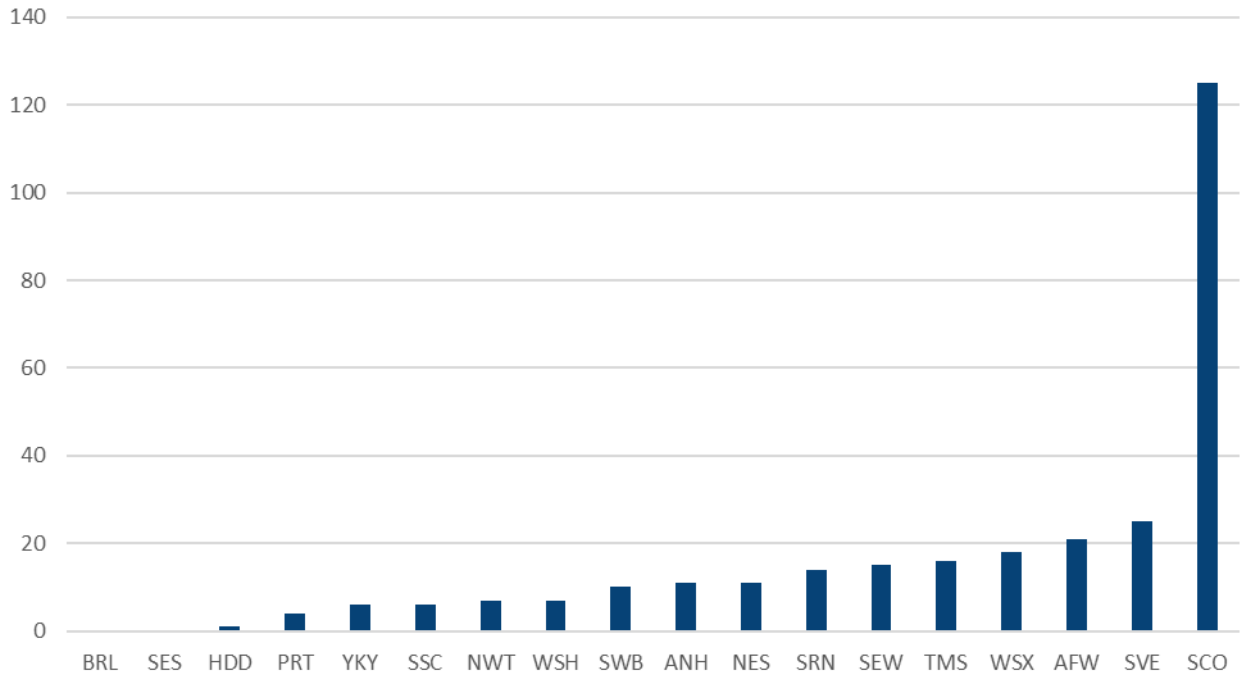
3.5.4. The efficient benchmark for Scottish Water is then established by applying the sector-wide benchmark to Scottish Water's predicted expenditure.

## 3.6. Water resources and treatment special factor claim

3.6.1. Scottish Water has proposed an adjustment for the number of small water treatment works that it operates compared to the companies in England and Wales. Scottish Water has provided evidence of this adjustment as a special factor claim.

3.6.2. Figure 16 shows that Scottish Water is a statistical outlier in the number of water treatment works it operates in the smallest size band compared to the companies in England and Wales. Scotland and England use different size bands for water treatment works. The smallest size band in Scotland is <= 1 Ml/d, and in England and Wales it is <= 2 Ml/d. On a like-for-like basis, Scottish Water would likely operate more water treatment works than Figure 16 shows.

*Figure 16: Number of water treatment works in smallest size band*




3.6.3. Scottish Water explains that this is not adequately captured in the models, as the issue is not the distribution input of small water treatment works, but the unit cost of small treatment works. Scottish Water has accounted for this by following the approach taken in the wastewater models, where septic tanks are excluded, by excluding the small water treatment works above the median level in England and Wales and the corresponding distribution input from those works. Scottish Water has calculated the cost of this to be £7.1 million per year.

3.6.4. WICS has assessed Scottish Water's special factor claim using the following criteria:

- Does the claim relate to unique circumstances compared to the companies in England and Wales;
- Is the claim under management control; and
- Is the claim material.

3.6.5. WICS considers that Scottish Water's special factor claim satisfies the three criteria and WICS's draft decision is that a special factor adjustment should be made to water resources and treatment.

3.6.6. However, WICS's water resources and treatment models are better suited to Scottish Water's circumstances than the models Scottish Water has used. WICS's models provide an additional £1.7 million in water resources and treatment compared to Scottish Water's. As such, we will adjust Scottish Water's modelled expenditure by £5.4 million.

## 3.7. Benchmarking the costs of the returning PFI assets

3.7.1. We have used the wastewater collection and treatment and bioresources models to benchmark Scottish Water's proposed costs of operating the returning PFI sites against the comparator companies in England and Wales.

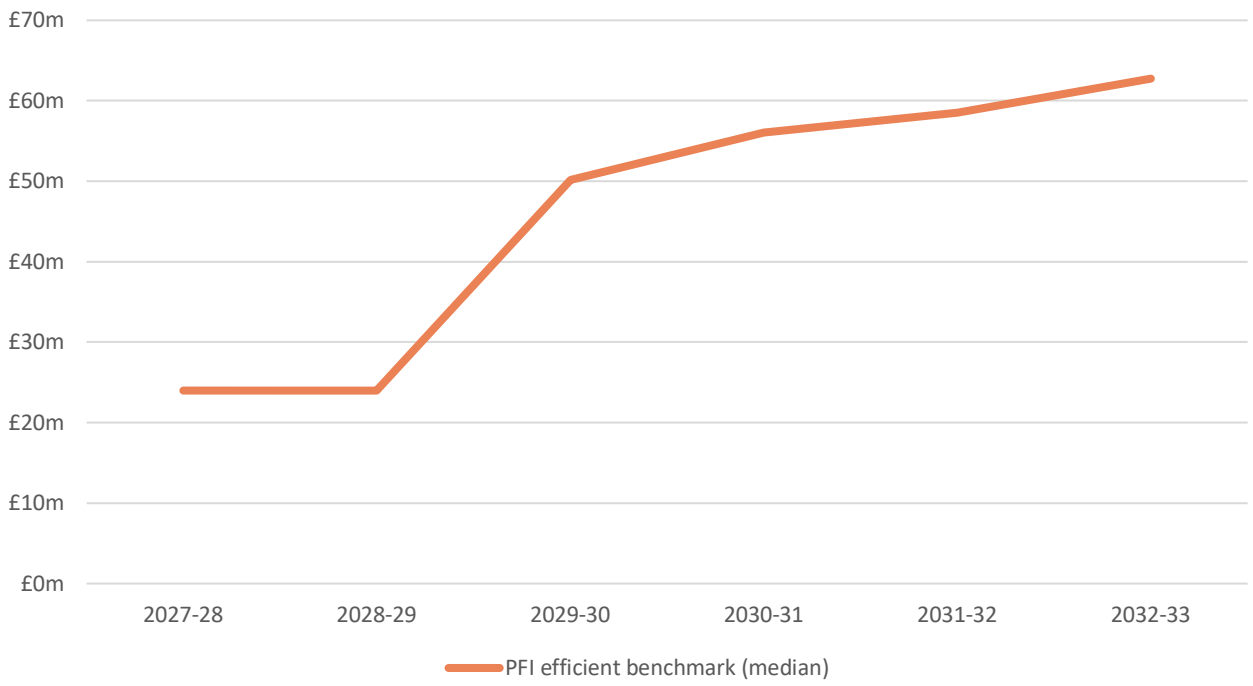
3.7.2. To achieve this, predicted operating expenditure (post efficiency) is calculated for Scottish Water, covering its own and returning PFI assets for both wastewater collection and treatment and bioresources. Then we subtract the predicted operating expenditure for Scottish Water's own assets for both wastewater collection and treatment and bioresources from this value, to leave the predicted operating expenditure for only the returning PFI assets. This is shown in Table 116.

*Table 116: PFI return predicted expenditure calculation*

| | 2027-28 | 2028-29 | 2029-30 | 2030-31 | 2031-32 | 2032-33 |
|---|---|---|---|---|---|---|
| Predicted operating expenditure for both Scottish Water's own assets and PFI return | £199m | £199m | £226m | £233m | £236m | £241m |
| Predicted operating expenditure for Scottish Water's own assets | £175m | £175m | £176m | £177m | £177m | £178m |
| Predicted operating expenditure for PFI return assets | £24m | £24m | £50m | £56m | £59m | £63m |

3.7.3. To allow for the gradual return of PFI assets both throughout the period and within the respective years, for each functional activity, we generate the predicted expenditure each time a PFI contract expires, and the associated assets are returned to Scottish Water's operational control. This is then consolidated into total predicted expenditure for all PFI return assets, so that if the asset returns mid-year, the expenditure for that portion of the year can be calculated. For example, as the Tay contract ends roughly two-thirds of the way into 2030-31, 29% of the expenditure attributed to Tay can be used in the total predicted expenditure. This allows for predicted expenditure to align with the gradual return of PFI assets throughout the period, as shown in Figure 17, where the orange line shows the consolidated predicted expenditure.

*Figure 17: Predicted expenditure associated with the gradual return of PFI assets*



# 4. West Central Bioresources assurance

## 4.1. Overview

4.1.1. This appendix provides further detail for Chapter 5 Investment allowances, section 5.6 on Scottish Water's proposed West Central Bioresource project, how WICS has reviewed the project and our draft assurance to Ministers in respect to their policy statement requirements.

4.1.2. Scottish Water proposes to invest in a new bioresource treatment centre, known as West Central Bioresources (WCB). The centre will replace the previous PFI site, which returned to Scottish Water on 1 April 2026. The centre will also serve as a hub for bioresource treatment, recovery and/or disposal in Scotland, bringing in imports of biosolids (byproducts of wastewater treatment processes that can be used for energy generation and can generate income) from smaller sites. This aligns with Scottish Water's bioresources strategy, developed in 2018. WCB is a separate investment area given its scale and value, representing the largest project for Scottish Water since it was created in 2002.

4.1.3. The appendix is structured as follows:

- Background of how bioresource is treated in Scotland and some of the issues the WCB project will aim to address;
- Scottish Water's proposals for the project in its final business plan;
- WICS' previous feedback on WCB throughout the project appraisal development;
- Scottish Government's assurance requirements as per its policy statement for WCB; and
- Our draft assurance statement based on our review of the project.

## 4.2. Background

4.2.1. When Scottish Water was created in 2002, it inherited 9 legacy Private Finance Initiative (PFI) contracts. Under these contracts, third parties operate and maintain 21 facilities across Scotland for the provision of wastewater treatment and the subsequent treatment, recovery and/or disposal of the biosolids (formerly known as sewage sludge or sludge.[172] In exchange for these services, the third parties receive regular payments from Scottish Water. The contracts stipulate how the payments are calculated covering aspects such as the inflation index applied to unit rates and the basis of charging (e.g. based on loads treated).

[172] Around 40-50% of wastewater is treated by third parties under PFI contracts. 80% of the biosolids that remains from the wastewater treatment process is treated, recovered and/or disposed of by third parties under PFI contracts.

4.2.2. As of 30 March 2026, 7 of those contracts remained, with 2 contracts expiring during the current regulatory period (comprising 2 facilities) and 4 contracts expiring during the SRC27 period (comprising 12 facilities) as outlined in Table 117.

*Table 117: PFI sites*[173]

| Site location | Contract end date | SRC period of end date | Percentage of wastewater in Scotland treated at site | Percentage of sludge in Scotland treated at site |
|---|---|---|---|---|
| **Daldowie** | 31/03/2026 | SRC21 | 0% | 34% |
| **Dalmuir** | 14/06/2026 | SRC21 | 9% | 7% |
| **Blackburn** | 29/04/2029 | SRC27 | 0% | 0% |
| **East Calder** | 29/04/2029 | SRC27 | 2% | 0% |
| **Newbridge** | 29/04/2029 | SRC27 | 0% | 0% |
| **Seafield** | 29/04/2029 | SRC27 | 13% | 19% |
| **Whitburn** | 29/04/2029 | SRC27 | 0% | 0% |
| **Hatton** | 16/12/2029 | SRC27 | 4% | 3% |
| **Banff/Macduff** | 25/06/2031 | SRC27 | 0% | 0% |
| **Buckie** | 25/06/2031 | SRC27 | 0% | 0% |
| **Lossiemouth** | 25/06/2031 | SRC27 | 1% | 2% |
| **Inverclyde** | 29/09/2032 | SRC27 | 1% | 0% |
| **Meadowhead** | 29/09/2032 | SRC27 | 3% | 7% |
| **Stevenston** | 29/09/2032 | SRC27 | 1% | 0% |
| **Levenmouth** | 30/10/2040 | SRC39 | 3% | 2% |
| | | **Total %** | **39%** | **75%** |

4.2.3. Once the contracts expire, the facilities will return to Scottish Water's operations.[174] This means that by the end of the 2027-33 regulatory period, 14 sites responsible for treating 35% of wastewater in Scotland and treating and disposing of around 70% of sludge in Scotland will have returned to Scottish Water.

4.2.4. The Daldowie bioresource treatment centre returned to Scottish Water on 1 April 2026, following the expiry of the PFI contract. As shown in Table 117, the Daldowie site is Scotland's largest bioresource facility, responsible for the treatment and disposal of around a third of the biosolids in Scotland.

[173] Contract end dates are as per Annual Return 2024-25 Table E3a, line E3a.29. Percentage of wastewater and sludge treated are calculated using site data for population equivalent of total load received (line E3.3) and total treated tons of dry solids (lines E3.33 to E3.40) respectively compared to the totals in table A3, lines A3.23 and A3.26.

[174] Scottish Water has an option to extend the PFI contract covering Meadowhead, Stevenston and Inverclyde (MSI) when it expires in 2032 until 2037. Scottish Water (2026), 'Business plan 2027-2033 Technical Appendices: Water Environment', February 2026. Scottish Water (2018), 'Scottish Water's Bioresource Strategy', report prepared by M2, June 2018, p.91.

4.2.5. The Daldowie site is served by the Greater Glasgow sludge main, which is a 32 km pipeline that conveys sludge from 5 wastewater treatment works in Glasgow. [175] This main accounts for around 70% of the sludge treated at the site. The remaining material is transported by tanker from other wastewater treatment works in the west of Scotland and central Scotland.

4.2.6. Scottish Water explains that the site's operational resilience has deteriorated over recent years due to outdated technology, which has resulted in decreased output and higher costs. As such, the plant currently processes only half the amount of sludge it is originally designed to treat. The reduced throughput puts more pressure on the bioresource storage tanks which have the capacity to hold 3 days' worth of sludge. Scottish Water explains that it has imposed intake restrictions for 44, 53, 28 and 58 days in 2022, 2023, 2024 and 2025 respectively.[176]

4.2.7. The current site treats the sludge and then dries it using six thermal dryers to produce a waste-derived fuel. Scottish Water explains that the site has the highest natural gas consumption across its asset base, resulting in 27,000 tonnes of carbon dioxide equivalent (CO2e) per annum.

4.2.8. The sludge from the West Central region (which is primarily treated at the Daldowie site) is disposed of through two main routes:

- Around 64% is sold to a cement works under an energy-from-waste agreement, which was signed at the time of the original PFI contract in 2002; and
- Around 36% is subject to land restoration, which entails remediating derelict land and former industrial sites such as open-cast mines, or is applied to agricultural land as fertiliser.[177, 178]

4.2.9. Scottish Water explains that the contract with the cement works ends with the expiry of the PFI contract in 2026, and the land restoration routes are expected to reach capacity in 2027-28. As such, these two disposal routes, which underpin the thermal drying model, will cease to be available at scale after 2027-28.

4.2.10. In the absence of these outlets, application to agricultural land becomes the main outlet in the near term. However, there are challenges associated with the application to land, including securing the required land bank.

[175] Scottish Water (2025), 'Stage 3a: outline investment appraisal level 1 – West Central Bioresource', June 2025, p.9.
[176] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.15.
[177] Scottish Water (2023), 'Stage 1: Case for Change. Level 1. West Central Bioresource', June 2023, p.7, submitted with the final business plan on 26 February 2026.
[178] Scottish Water (2026) 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.16.

4.2.11. Scottish Water identifies three main treatment options for the site:

- Investment to replace the dryers;
- Investment to upgrade the facility to enable liming; and
- Investment in a new advanced anaerobic digestion (AAD) facility on the site of the existing Daldowie bioresource facility.

4.2.12. Scottish Water's business plan proposes the third option, which forms part of a wider strategy for bioresources. This strategy is based on consolidating sludge treatment at 2-3 dedicated bioresource facilities in Scotland.[179]

4.2.13. This project, West Central Bioresources, is the largest for Scottish Water since it was created in 2002, with a forecast cost of around £560 million. It involves both a new site and upgrades to other wastewater treatment works to enable the export of sludge to the West Central Bioresources site via tanker, as shown in Table 118.[180]

*Table 118: West Central Bioresources Investment*

| Description | Investment (£m; 2024-25 prices) |
|---|---|
| West Central Bioresources | 423.5 |
| Land restoration mitigation - liming sites | 5.6 |
| West Central System - Cupar | 4.8 |
| West Central System - Dunfemline | 4.8 |
| West Central System - Kirkcaldy | 4.8 |
| West Central System - St Andrews | 4.8 |
| West Central System - Cumnock | 14.3 |
| West Central System - Dalderse | 9.5 |
| West Central System - Girvan | 4.8 |
| West Central System - Kinniel Kerse | 9.5 |
| West Central System - Meadowhead | 9.5 |
| West Central System - Stirling | 4.8 |
| West Central System - Screening | 47.5 |
| West Central System - Greater Glasgow Sludge Main | 9.5 |
| **Total investment** | **557.4** |

4.2.14. In 7 November 2025, the Cabinet Secretary for Climate Action and Energy set out the Scottish Government's policy position for West Central Bioresource.[181] The letter asks Scottish Water

[179] Scottish Water (2018), 'Scottish Water's Bioresource Strategy', report prepared by M2, June 2018, submitted with the final business plan on 26 February 2026.
[180] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.76.
[181] Scottish Government (2025), 'Letter from the Cabinet Secretary for climate action and energy', letter dated 7 November 2025.

to consider alternative financing options consistent with the requirements for major projects in the Scottish Public Finance Manual, to ensure appraisal is undertaken to HM Treasury Green Book standards, and to explore whether the project's objectives could support a Just Transition at Grangemouth. Scottish Ministers requested assurance from WICS that Scottish Water's options appraisal is consistent with this policy position, and assurance from SEPA that the project will deliver good environmental outcomes. Sub-section 4.5 has further detail on Scottish Government's requirements.

## 4.3. Scottish Water's proposals

4.3.1. The West Central Bioresources project investment appraisals (stages 1, 2 and 3a) show that Scottish Water has considered numerous options and various combinations for a solution based on several aspects: potential existing sites, potential new locations, number of sites for project (combinations of existing sites and new locations), type of technology for tertiary treatment, whether to fully treat the bioresource in-house or export the sludge cake to third parties, whether to extend Business-As-Usual (BAU) activity for some time before implementing a new technology.

4.3.2. Scottish Water has applied various criteria to reduce the options/variations including:

- Availability of land within and adjacent to identified sites;
- Transport links / access;
- Proximity to the Greater Glasgow Sludge Main (GGSM);
- Capacity to export biomethane or excess power;
- Liquor treatment capacity;
- Environmental, community and planning constraints;
- Buildability; and
- Technical feasibility and resulting compliance.

4.3.3. In its latest appraisal (Stage 3a), Scottish Water has considered three categories of options which are outlined in the following paragraphs:

- 5 site configuration options;
- 2 deferral options (for postponing investment in SRC33 while maintaining BAU until then); and
- 3 financing options.

4.3.4. Following its optioneering in Stages 1 and 2 and considering the Stage 2 appraisal for the bioresource treatment in Fife & Tayside region, Scottish Water assessed the following 5 configuration options in Stage 3a appraisal for the West Central Bioresources project:[182]

- **Option 4a: One site at Daldowie (capacity of 85,000 tonnes of Dry Solids/year)** – build an AAD plant at Daldowie and transport all bioresource to the site via GGSM, liquid tanker or as cake. Dewatering capabilities will be added to current Sludge Treatment Centre (STC) sites that need to transport their cake. AAD plant will implement 4 Cambi streams to ensure resilience during outages (no single point of failure). This is Scottish Water's proposed option.
- **Option 6a: One site at Kinneil Kerse (85,000tDS/yr)** – build an AAD plant (with 4 Cambi streams) at Kinneil Kerse and transport all bioresource to the site via liquid tanker or as cake. Dewatering capabilities will be added to current STC sites that need to transport their cake. Designed with no single point of failure.
- **Option 6b: One site at Daldowie (65,000TDS/yr) and second site at Kinneil Kerse (20,000TDS/yr)** – build two AAD plants, one at Daldowie (3 Cambi streams) and one at Kinneil Kerse (1 Cambi stream). The bioresource from West Central will be transported to Daldowie via GGSM, liquid tanker or as cake, and the bioresource from Fife & Tayside to Kinneil Kerse via liquid tanker or as cake. Dewatering capabilities will be added to current STC sites that need to transport their cake. Less potential to create no single point of failure at two sites.
- **Option 0a: BAU (dryer with carbon capture)** – maintain existing operational practices alongside investment required to keep legal obligations and service levels. Existing STCs will remain. Run the existing dryers at Daldowie and replace dryers and other components (including civils) at end of life, as well as instal, maintain and run liming facilities (including storage) at other STCs to produce a treated product suitable for agriculture. This option also includes the cost of purchasing and maintaining forested land to store emissions in line with the UK's Woodland Carbon Code. Scottish Water notes this option does not meet the Need of the project.
- **Option 0b: BAU (liming)** – maintain current operational practices alongside investment required to keep legal obligations and service levels. Existing STCs will remain. Instal, maintain and run liming facilities (including storage) at all sites to produce a treated product suitable for agriculture. This includes Daldowie, which will switch to liming upon PFI return with dryers being decommissioned. Scottish Water notes this option does not meet the Need of the project.

4.3.5. Scottish Water also considered 2 deferral options compared to Option 4a above where it would postpone the commissioning of an AAD plant in Daldowie from 2031 to 2037 and

[182] Scottish Water (2025), 'Stage 3a: Outline Investment Appraisal. Level 1. West Central Bioresource', June 2025, pp.27-28, submitted with the final business plan on 26 February 2026.

would implement Options 0a (driers at Daldowie, liming at other STCs) or Option 0b (liming at all STCs) until the AAD plant is operational. The aim of the deferral options is to mitigate the project's impact on the investment programme for SRC27.

4.3.6. Finally, Scottish Water also considered 3 options for how to finance the project:

- Use revenue from customer charges in SRC27 and direct government borrowing – this allows Scottish Water to maintain full ownership and control over the project;
- Utilise a Mutual Investment Model (MIM) – this involves the creation of a Special Purpose Vehicle with private co-investors in which Scottish Water would take a minority stake (maximum 20% for a public body). This results in a profit-sharing mechanism (in proportion to share ownership) and enhanced governance from the issuer (i.e. Scottish Water), which addresses some of the criticisms of the old PFI model. The MIM also aims to ensure that the borrowing associated with the infrastructure asset does not count as Government debt – i.e. is 'off balance sheet', which would help spread the cost for Scottish customers over a longer period of time. However, some drawbacks include the requirement for the private co-investor(s) to hold the full risk from the project (so the investment can be classified as 'off balance sheet') and a potentially long process for establishing the MIM in Scotland and for procuring the private partner(s) for West Central Bioresources; and
- Regulated Asset Base (RAB) Model – under this model, customer charges are directly used to fund the investment rather than relying solely on government grants or purely private financing.

4.3.7. Scottish Water has assessed the 5 site configuration options in terms of costs, carbon emissions, risks and benefits. Based on this assessment it has determined that Option 4a (one site at Daldowie (85,000 tDS/yr)) has the lowest Net Present Cost over 60 years (accounting for capital and operational costs as well as expected revenue generated from biogas production), the lowest whole-life carbon over 60 years, the lowest level of assessed risk, and is one of the options with the highest level of benefits.

4.3.8. Scottish Water has assessed the 2 deferral options in terms of costs and risks, and determined that the deferral options have £70 million to £140 million higher net present costs over 60 years (2025 quarter 1 prices) compared to the preferred Option 4a due to the additional capital costs incurred to maintain the assets before building the AAD facility, as well as the higher operational costs of continuing to use drying and liming for longer. The deferral options would have additional risks including:

- The financial, operational and environmental risks associated with continuing operation of the existing driers beyond their expected lifetime and the likelihood of their failure;

- The compliance risk of relying on landbank disposal (for the limning option) for longer when competition is reducing the availability of this route – this is partly in relation to the introduction of new regulations, the Environmental Authorisation Scotland Regulations (EASR), from SEPA in November 2025. These new regulations reduce the volume of sludge that Scottish Water can dispose of to land by around 65% of current levels, increasing the land that Scottish Water would require by 3-4 times if current operations continue;
- The financial risk of more costly investment in the future in the event that stricter environmental regulations necessitate technology in addition to AAD; and
- The procurement and supply chain risk that materials and resources will be more expensive to acquire in future regulatory periods.

4.3.9. Scottish Water has assessed the 3 financing options in terms of costs (for the 3 main site configuration options, excluding Option 0a and 0b) and risks. It determined that the cheapest financing option in the long term is where the project is fully funded by Scottish Water, it observed this is more expensive in the short term (i.e. in SRC27) than the MIM or RAB options. Scottish Water considers that the RAB model would require legislative changes and a long procurement process (c. 4.5 years), and that the MIM model would take around 2.5-3 years to procure which would put pressure on delivery timelines and carry the risks of the deferral options described above.

4.3.10. Based on its assessment of the site configuration, deferral and financing options, Scottish Water proposes to proceed with a single AAD plant in Daldowie (85,000 tDS/yr) funded fully by Scottish Water.

## 4.4. Our previous feedback

4.4.1. Scottish Water first brought this project to our attention at the August 2024 Water Industry Investment Group Working Group meeting after it had passed its Stage 2 Project Investment Appraisal at Gate 40 in April 2024. Scottish Water outlined there were several issues with the current arrangement: “The existing treatment technologies are energy-intensive, do not generate energy, and are costly to operate. The land restoration outlet is expected to be exhausted by 2030, and the Greater Glasgow Sludge Main (GGSM) is susceptible to recurring failures. Additionally, the region lacks the capacity to accommodate anticipated growth, making it imperative to change the way bioresource is treated to meet Scottish Water's strategic aims and objective”.[183]

4.4.2. We have consistently communicated our expectations to Scottish Water that it should provide robust assurance for high-value projects such as this one. We have also engaged

[183] Scottish Water (2024) ‘Scottish Government Investment Group Working Group (SG IGWG) – Progress of Interventions to Meet the Needs on the Development List – Draft Report Q1 2024/25’, August 2024, pp.6-7.

with Scottish Water specifically on this project to better understand the need for investment, technical optioneering, costing, and financing options, including querying Scottish Water on the assumptions it has made during its appraisal and challenging its decisions to discount options early in the process.

4.4.3. At the time of the draft business plan submission, the West Central Bioresources had not yet passed Gate 50 and so did not meet the criteria for requiring an investment case to be submitted with the draft business plan. Due to the high forecast cost for this project, Scottish Water provided information to support the investment case in response to our queries.

4.4.4. In our feedback on the draft business plan, we highlighted that there is scope to examine the mutual investment model (MIM) as this was not assessed in detail in the information provided by Scottish Water at the time unlike the Stage 3a appraisal submitted with the final business plan. Given the size of this project, we considered that utilising this approach would help to spread the project's cost across both current and future customers beyond the regulatory period 2027-33. This also recognised the potential scope for adopting new technologies and innovations related to resource recovery. We requested that Scottish Water provide further analysis on the prospect of extending the life of the existing asset, enabling Scottish Water to assess the MIM option more fully, and more detailed assessment on the viability of a MIM option itself.[184] We also noted that Scottish Water must demonstrate that the proposed option represents best value for customers, both current customers in the 2027-33 regulatory period and future customers.

4.4.5. As outlined in paragraph 4.2.14 and detailed in sub-section 4.5, on 7 November 2025 the Scottish Government set out its position on the West Central Bioresources. Following this, WICS issued a letter to Scottish Water on 27 November 2025 which clarified our expectations for the West Central Bioresources investment case and outlined further requests to Scottish Water. These are detailed in the following paragraphs.

4.4.6. We issued clarifications around our expectations for the content of the investment case for West Central Bioresources, particularly on the cost benefit analysis (CBA) of the different options. We expected this to include the following:

- Scottish Water's assumptions for the financing of the self-deliver option, to ensure that the self-delivery and MIM options are compared on a like-for-like basis.
- Scottish Water's consideration and assumptions for the benefits of the different options, covering both the direct benefits, where the benefits accrue directly to Scottish Water's customers, and indirect benefits such as broader economic impacts. This would include assumptions for the benefits of utilising the knowledge and expertise of a third-party, who may have expertise to utilise the technology and

[184] WICS (2025), 'Feedback on Scottish Water's draft business plan for SRC 2027-2033', August 2025, p.14.

innovation related to resource recovery from biosolids and be able to deliver and/or operate the facility more efficiently than Scottish Water.
- Scottish Water's other assumptions, such as the financing costs associated with the different options and the discount rate used in the CBA.
- An assessment of the CBA on a post-tax basis, recognising that the different options will have an impact on Scottish Water's corporation taxation.

4.4.7. We also noted that we expect the investment case to explain how Scottish Water will ensure that customers are adequately protected from construction and cost escalation risk under the different options.

4.4.8. In relation to the Government's policy position, we made the following additional requirements:

- The detailed timeline for the development of the project, which provides sufficient time for WICS and SEPA to provide assurances to Ministers. This should cover the overall project timeline, which may differ for the different options, as well as the procedural timeline that will enable WICS and SEPA to provide assurances to Ministers.
- Details of Scottish Water's engagement with SEPA on SEPA granting a longer timeframe for achieving compliance with EASR and the outcome of that engagement.
- The framework and criteria that Scottish Water will use in assessing the different options, including self-delivery and the mutual investment model.
- Scottish Water's assessment of the different options against these criteria.
- The implications of not meeting compliance with the EASR.

4.4.9. The following sub-sections cover Scottish Government's assurance requirements in more detail and WICS' assurance statement on the West Central Bioresource following our analysis of the available evidence against those requirements.

## 4.5. Scottish Government's assurance requirements

4.5.1. The Cabinet Secretary for Climate Action and Energy issued a letter to Scottish Water on 7 November 2025 detailing the Scottish Government policy position on West Central Bioresource. The policy position establishes how Scottish Water should appraise the options for this project to deliver on the priorities of the Scottish Government, specifically enabling growth, tackling the climate emergency, and ensuring high quality and sustainable public wastewater services.

4.5.2. Table 119 below lists the requirements of the policy position.

*Table 119: Scottish Government's requirements for the appraisal of West Central Bioresources*

| Short name | Requirements from the Scottish Government policy position on West Central Bioresources |
|---|---|
| Just Transition | Given the likely scale of the capital investment required, Scottish Government is keen to ensure that Scottish Water has fully appraised options that could include further supporting the Scottish Government's Just Transition ambitions, e.g. Scottish Government's long-term vision for the future of the Grangemouth Industrial cluster. |
| Green Book | That appraisal should comply with HM Treasury's Green Book. |
| Infrastructure Investment Plan and draft Bioenergy Policy Statement | The solution developed should align with the Scottish Government's Infrastructure Investment Plan and draft Bioenergy Policy Statement, including integrating carbon capture technology, where feasible. |
| Net Zero target and circular economy | Furthermore, the solution should support the Just Transition Plan, the circular economy strategy, and achievement of net zero emissions by 2045. |
| SPFM | Mindful of the cost of living crisis, the solution developed should consider how best capital costs can be shared between current and future customers. This should be achieved by undertaking an appraisal process compliant with the requirements for major investment projects in the Scottish Public Finance Manual (SPFM), in particular the section on funding and procuring. |
| MIM | The project should be considered for the Mutual Investment Model. |
| Value for Money | The solution can support [alignment to First Minister's priorities] by:<br>• Representing value for money. |
| Economic impact | The solution can support [alignment to First Minister's priorities] by:<br>• Scottish Water must appraise options against their economic impact. This includes giving consideration to whole life costs and how capital costs can be shared between current and future customers. Scottish Water's appraisal process should be compliant with the requirements for major investment projects set out in the SPFM. |

| Short name | Requirements from the Scottish Government policy position on West Central Bioresources |
|---|---|
| Benefits | The solution can support [alignment to First Minister's priorities] by:<br>• Scottish Water should also consider qualitative or quantitative wider economic benefits of the project. |
| Policy integration | The solution can support [alignment to First Minister's priorities] by:<br>• Scottish Water must appraise the options for this project against the potential for the solution to integrate with existing policies and plans at the national, regional and local level, e.g. National Planning Framework 4. |
| Environmental Impact Assessment | The solution can support [alignment to First Minister's priorities] by:<br>• Scottish Government recognises the link between climate change mitigation and other environmental effects such as biodiversity loss. Scottish Government is also committed to a Just Transition that considers the impact of climate change on communities and individuals.<br>Scottish Water should appraise the options for the project against a range of environmental factors in line with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017. These include:<br>– Population and Human Health<br>– Biodiversity<br>– Land, soil, water, air and climate<br>– Material assets, cultural heritage and the landscape<br>– Vulnerability of the proposed development to major accidents and disasters<br>This is to reflect the overall balance of environmental impact and benefits. |
| Governance arrangements | The governance arrangements for this project must be consistent with the arrangements for major investment projects set out in the SPFM. |

4.5.3. On 26 February 2026 Scottish Water's Chair responded to the Cabinet Secretary's letter, explaining how Scottish Water has met each of the requirements in the policy position.

## 4.6. Our assurance

4.6.1. This section explains how we have tested Scottish Water's analysis and appraisal of the West Central Bioresources project in terms of the investment need, the process of defining and assessing options, the cost assessment of the options, and provides our assurance as to how well the appraisal has met the requirements of the Scottish Government's policy position.

4.6.2. Our assessment has been informed by the engineering review undertaken by our consultants WSP of the West Central Bioresources project, which followed the scope detailed in paragraphs 1.2.62 and 1.2.63.

### Assessment of the investment need(s)

4.6.3. According to the Stage 1 Project Investment Appraisal from June 2023,[185] the "to be" position of the projects is to:

- Maximise resource recovery and renewable energy from bioresource;
- Reduce energy usage, carbon footprint and operating costs of bioresource treatment;
- Recycle all biosolids to a sustainable outlet;
- Reduce the risk and improve the resilience of processing bioresource in the area; and
- Accommodate planned growth.

4.6.4. The primary need was identified as "N807 Maximise value from bioresource product: Develop plans to generate energy and maximise value at Daldowie Sludge Treatment Centre post PFI contract". However, during discussions, Scottish Water has indicated that the primary need is to provide resilience in treatment capacity and in market outlets for treated bioresource (which is partly reflected in the need to maximise bioresource value). The criteria used to later on evaluate the long list of options were reflective of the identified needs: improve compliance and operational resilience (including future growth and future-proofing for potential changes in legislation and technology), maximise value from bioresources by maximising energy generation and minimising carbon emissions and costs, and resolve working conditions of dryer building at Daldowie.[186]

4.6.5. Based on their detailed review of the project, our external engineering consultants WSP have a high confidence that there is a clear need to invest to maximise bioresource value, to

[185] Scottish Water (2023), 'Stage 1: Case for Change. Level 1. West Central Bioresource', June 2023, p. 4, submitted with the final business plan on 26 February 2026.
[186] Scottish Water (2024), 'Stage 2: Strategic Option Review. Level 1. West Central Bioresource', April 2024, p.7, submitted with the final business plan on 26 February 2026.

maintain treatment centres, and to improve overall system resilience. Transition to AAD will increase the opportunity to derive value from bioresource treatment – in terms of risk mitigation, system resilience, greenhouse gas reduction and (potential) revenue. Improved bioresource quality also provides the greatest range of options for recycling to agricultural (and other) land – although there is no guarantee that such land will be available. The current state of the assets does not meet those needs, as the Daldowie site is nearing its end of life and would not provide resilience or scope for growth. Furthermore, Scottish Water explains the satellite sites do not meet current regulatory or asset standards. The current market outlets also appear unreliable and uncertain as explained in paragraphs 4.2.9 and 4.2.10. WSP supports the adaptive planning strategy underpinning the wider bioresource programme, highlighting that upgrading smaller, non-compliant treatment sites into feeder hubs is a low-regret investment that enhances system flexibility while ensuring regulatory compliance.

4.6.6. In conclusion, we consider that Scottish Water has evidenced the project need. There are several needs the project seeks to address, aligned with the SRC21 and SRC27 Ministerial Objectives for growth, the circular economy, and climate change (particularly achieving the net zero target).[187]

### Assessment of optioneering process

4.6.7. As explained in section 4.3, there are three categories of options Scottish Water has considered during the appraisal process. This sub-section will first assess Scottish Water's evaluation of the options for technical solution and timing, followed by the options for financing.

#### *Options for technical solution and timing*

4.6.8. Our engineering consultants, WSP, have a high confidence that options for a technical solution (including 'do nothing') have been adequately explored – including system-wide aspects. The proposed hub-and-spoke treatment/dewatering model has been in development for around a decade, is common outside Scotland and is well supported in terms of supply chain knowledge and capabilities. It also represents a 'no / least' regret option for future add-ons that might be required in the event of regulatory or market changes. WSP considers that the preferred AAD solution will maximise bioresource value and the Daldowie site offers optimum logistical opportunity for location of a single AAD hub at a lower price than multiple hubs.

4.6.9. In terms of considering Grangemouth as a site for the AAD facility, Scottish Water explains that "the economic analysis of building and operating a new AAD site at Kinneil Kerse is

[187] Scottish Water (2023), 'Stage 1: Case for Change. Level 1. West Central Bioresource', June 2023, Appendix 5 on p.22, submitted with the final business plan on 26 February 2026.

functionally equivalent to that for a site in Grangemouth, given close proximity".[188] However, according to Scottish Water's assessment, the Grangemouth site option can be viable only if there is confirmed interest from a third-party developer in establishing a new AAD facility, and if there is high confidence that Scotland's bioresource sector will grow to a level that it would need to process more than 85K tDS/year so that economies of scale can be achieved.[189] On the latter dependency, WSP considers that this would require import of other materials for anaerobic digestion which would create regulatory issues with the digestate residue, since they would no longer be eligible for end of waste status / biofertiliser quality assurance following their co- processing with bioresource. WSP also noted that the Grangemouth site may offer the benefit of allowing future production of Sustainable Aviation Fuel (SAF) from bioresource; however, the Daldowie site option could still achieve this benefit by producing the precursors for SAF for onward transport to Grangemouth for upgrading or refining. On this basis, Scottish Water has demonstrated it has considered Grangemouth (or Kinneil Kerse in immediate proximity) as a site for the AAD facility to support the Scottish Government's Just Transition plan for that industrial cluster.

4.6.10. Regarding the timing options of investing now or deferring to SRC33, Scottish Water has provided further information to WSP in response to the latter's WCB review queries regarding the condition of the driers and their remaining asset life. Scottish Water has explained that the terms of the handover contract provide a mechanism for Scottish Water to recoup costs associated with works necessary to ensure dryers are in a compliant condition. Asset inspections have previously taken place at around 3 year intervals and are currently underway, following PFI handover. WSP noted that the contractual approach provides confidence that risks associated with dryer failure are well understood. We consider that Scottish Water has considered these options.

4.6.11. Overall, we consider that Scottish Water has evidenced that it has considered different options for the provision of bioresources treatment and disposal, following the return of the Daldowie site.

4.6.12. Regarding the consideration of benefits, Scottish Water demonstrates in the Stage 3a project investment appraisal that it has considered the whole-life (60-years) carbon values of the 5 main technical solution options for both embodied and operational emissions.[190] Appendix 3 of that document also shows the assessment of the options against various criteria, including benefits such as energy capture and generation, as well as the quantity and quality

[188] Scottish Water (2025), 'West Central Bioresource PIA: WICS briefing session 20/05/2025', slide 16, submitted with the final business plan on 26 February 2026.
[189] Scottish Water (2026), 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.28.
[190] Scottish Water (2025), 'Stage 3a: Outline Investment Appraisal. Level 1. West Central Bioresource', June 2025, p.36, submitted with the final business plan on 26 February 2026.

of bioresource output. However, there seems to be a limited number of other wider and also non-financial economic benefits considered outside of energy capture and generation.

4.6.13. Regarding the consideration of risks, WSP has high confidence that Scottish Water has, in large part, considered risks well and has proposed appropriate mitigations. However, WSP also highlights its concerns that Scottish Water has not yet modelled the extent of landbank requirements under EASR, though Scottish Water has confirmed to WSP that such as an assessment is underway. The project appraisal assumes there will be available access to agricultural landbank, but this has not been market tested. Both of these could have material impacts on post-AAD management of the treated bioresource. We also have reservations about how well risk has been considered and mitigated in relation to available land at the Daldowie site to accommodate potential future expansion of the AAD facility, e.g. if another treatment stream or future bolt-on technologies are required. This is based on the available area shown in the provisional site layout design in Figure 16 of technical appendix 10, and the potential area required by future bolt-on technologies and associated ancillary assets.

4.6.14. Regarding whether the proposed scope addresses all the investment needs, we have concerns over the size of the proposed plant. The Stage 1 project investment appraisal explains that "This project will provide the required capacity to accommodate planned growth and will consider providing headroom above the required capacity".[191] We asked our engineering consultants, WSP, if there was evidence that this need had been addressed. WSP advised that according to the Basis of Design[192] for the new works the average and peak throughput required was 82.5ttDS/year and 103.7ttDS/year respectively and that growth factors have been applied. However, it remains unclear if "headroom above the required capacity" has been considered in the basis of design.

4.6.15. As such, there are three areas where Scottish Water should provide further evidence:

- the need for more landbank for the disposal of the treated biosolids;
- whether it has fully considered "headroom above the required capacity" in the project designs, to ensure the asset is future-proofed; and
- the availability of land at the Daldowie site to accommodate potential future expansion of the AAD facility, e.g. if another treatment stream or future bolt-on technologies are required. This is based on the available area shown in the provisional site layout design in Figure 16 of technical appendix 10, and the potential area required by future bolt-on technologies and associated ancillary assets.

[191] Scottish Water (2023), 'Stage 1: Case for Change. Level 1. West Central Bioresource', June 2023, p. 12, submitted with the final business plan on 26 February 2026
[192] m2 (2025), 'West Central Bioresource Basis of Design PART A', October 2025.

*Options for financing the project*

4.6.16. As explained in paragraph 4.3.6, Scottish Water considered 3 financing options: 'in-house' delivery funded by customer charges and government borrowing, a Mutual Investment Model (MIM) and a Regulated Asset Base (RAB) model. The following paragraphs focus on assessing the MIM option as per the Scottish Government's assurance requirements.

4.6.17. As explained in paragraph 4.3.6, a MIM is similar to a Private Finance Initiative (PFI) contract in that it aims to ensure that the borrowing associated with the infrastructure asset does not count as Government debt – i.e. is 'off balance sheet'. The main difference between a PFI and an MIM is that the latter involves the public body taking a minority stake in the holding company (as a special purpose vehicle) responsible for the investment in the asset. Profit sharing and enhanced governance from the issuer address some of the criticisms of PFI.

4.6.18. The Office for National Statistics (ONS) applies Eurostat's guidance and criteria to determine whether the asset and its associated financing are classified as private or public. If it is the latter, then the financing related to the project will be counted as Government debt. As part of the assessment, ONS examines construction, availability and demand risk. For off-balance-sheet classification, the private sector must bear these risks. ONS reviews classification on an ongoing basis, meaning balance sheet classification can change over the lifetime of the MIM.

4.6.19. Given these factors, MIM has been used for projects with the following characteristics:

- Projects that are standardised and non-complex, allowing construction risk to be transferred to the private sector;
- Project outcomes are fixed over the lifetime of the asset; and
- Large projects (>£500 million), to attract international investors and contractors.

4.6.20. Therefore, to be viable a MIM for WCB would need to meet these criteria in a way that provides high confidence that the ONS would classify the financing as an off-balance-sheet item and that it would remain so over the lifetime of the MIM. If this were not the case, then the MIM would count as Scottish Government debt. In this scenario, it is unclear who would bear the risk of reclassification and the consequences if the borrowing is counted towards Scottish Government debt either at the outset or over the duration of the MIM.

4.6.21. There is no precedent of MIMs in Scotland; however, MIMs have been used in Wales for roads and accommodation-based solutions.[193] The Scottish Government has examined the use of a MIM for the dualling of the A9; however, it was recently discounted, recognising that the cost of a MIM is around 28% higher than the alternative Scottish Government

[193] Welsh Government (2024), 'Mutual Investment Model Report 2022-2024', 20 May 2024, available at https://www.gov.wales/annual-mutual-investment-model-report-july-2022-to-march-2024

capital-funded project. As such, it was concluded that MIM contracts for the A9 dualling programme would deliver poorer value for money than capital-funded projects.[194]

4.6.22. With this context in mind, the following paragraphs explain our assessment of Scottish Water's optioneering process.

4.6.23. Scottish Water has commissioned two consultancy reports as part of the evidence on the suitability of the MIM model for WCB.

- EY Parthenon report providing an initial assessment against the potential classification for a MIM;[195] and
- EY Parthenon market engagement, testing market appetite for a MIM.[196]

4.6.24. The first report found that a MIM can be structured so as not to trigger the automatic on-balance-sheet provisions in Eurostat guidance.[197] However, this was an initial view, and further work will be required to develop the project scope and risk allocation. The second report documented interviews with project sponsors, senior finance providers, and contractors to test market appetite for an MIM for an AAD facility. There was an appetite; however, an unwillingness to accept full fixed-price construction risk.[198] EY Parthenon concluded that a form of shared-risk procurement could be challenging to accommodate within the requirements for an off-balance-sheet classification.[199]

4.6.25. Our engineering consultants, WSP, reviewed Scottish Water's assessment of the MIM option and provided their own assessment to WICS based on information from Scottish Water and WSP's own experience and knowledge in this area. WSP considers the WCB Project is partially consistent with the characteristics of a project suitable for delivery through MIM. There is high confidence in the certainty of need, underpinned by statutory drivers and long-term system importance. However, overall confidence is only moderate due to unresolved scope definition, output specification, demand sensitivity and interface risks, which suggest constraints in terms of Scottish Water's ability to transfer risk to the private sector at a reasonable price.

4.6.26. Scottish Water's early market feedback indicated there is insufficient ability to transfer risk to the private sector and Scottish Water made an early decision to discount MIM based on this. However, WSP considers this decision is not yet strongly evidenced, in part due to limited response from the market and the constraints on the assessment due to the preliminary nature of the scope and risk definition at this stage. Confidence in the

[194] Scottish Parliament (2026), 'Official Report: Meeting of the Parliament Wednesday', 14 January 2026, available at Official Report, last accessed on 5 May 2026.
[195] EY Parthenon (2025), 'Project Farm 2', 26 August 2025.
[196] EY Parthenon (2026), 'Scottish Water Mutual Investment Model', 30 January 2026.
[197] EY Parthenon (2025), 'Project Farm 2', 26 August 2025, p.7.
[198] EY Parthenon (2026), 'Scottish Water Mutual Investment Model', 30 January 2026, p.10.
[199] EY Parthenon (2026), 'Scottish Water Mutual Investment Model', 30 January 2026, p.12.

assessment of the suitability of a MIM would be improved through further development of scope and risk allocation, structured optioneering on delivery and contractual approaches, and targeted re-engagement with the market. These activities would provide a more robust basis on which to confirm whether MIM can achieve the necessary risk transfer required for delivering the WCB project under a MIM model. While MIM remains theoretically capable of passing ONS classification tests and being treated off balance sheet, confidence in its practical deliverability is low due to the issues identified.

4.6.27. On the benefits of in-house versus MIM delivery, Scottish Water's analysis concludes that in-house delivery is preferable to a MIM for the WCB project, primarily due to greater delivery certainty and lower whole-life cost – all costs for self-delivery over 60 years are estimated to be £1,097 million, while for MIM (including service payments and return of the asset to Scottish Water after 25 years) these are estimated to be £1,580 million (in 2024-25 prices).[200] This suggests that a MIM would have a premium of around £480 million or 40%.

4.6.28. WSP considers that this assessment provides a reasonable directional view but does not represent a fully consolidated or exhaustive comparison across delivery models. The evidence robustly demonstrates that in-house delivery offers stronger operational control and avoids delays and execution risks associated with a first-of-a-kind MIM procurement in Scotland. The whole-life cost modelling transparently shows a material and structurally driven cost premium under MIM arising from private financing, equity returns and taxation, thus supporting the assessment that self-funded delivery offers better value to customers. While the potential benefits of a MIM approach - such as risk transfer, whole-life incentives, and contractual mechanisms to support innovation - are recognised in principle, the evidence available to date does not demonstrate that these benefits would be sufficiently distinctive, reliably achievable, or material in the specific context of the WCB project. In several areas, conclusions relating to MIM are informed by limited market engagement. Furthermore, the absence of a fully developed MIM delivery and risk allocation model constrains confidence in the assessment. Overall, WSP considers that Scottish Water's conclusions are reasonable and the emphasis placed on cost and delivery certainty is appropriate; however the depth and strength of evidence across the full range of stated benefits is mixed.

4.6.29. Regarding the impact of the EASR on the choice of technology or funding options, MIM will require the use of liming for a longer period of time. Since liming has more environmentally harmful phosphate compounds than other treatment methods such as AAD, this would require less frequent disposal of treated bioresource to land to manage potential pollution risks and to be compliant with regulations. As such, more landbank will be required under a MIM option. The longer any transition between current and future bioresource treatment

[200] Scottish Water (2026) 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.45.

systems, the greater the cost to Scottish Water and the greater the risk, simply due to the nature of lime-treated bioresource. The self-delivery option is then preferable over a MIM delivery due to the quicker transition and associated less costs and lower risk in terms of landbank requirements.

4.6.30. Scottish Water's assessment of the additional cost of a MIM for WCB also exceeds the 28% additional cost identified in relation to the A9, where the Scottish Government concluded that MIM contracts would deliver poorer value for money than capital-funded projects. While the A9 is not directly comparable to WCB, it provides a relevant caution when considering whether the additional cost of a MIM would be justified.

4.6.31. Our engagement with the Scottish Futures Trust has reinforced the importance of the classification risk. In particular, it highlighted the uncertainty over whether the project could achieve off-balance-sheet classification at the outset and maintain it over the asset's lifetime. Without sufficient confidence in classification and risk allocation, a MIM may not achieve the purpose for which it is being considered.

4.6.32. Overall, we consider that Scottish Water's market testing could have been more comprehensive, particularly given the limited number of contractors engaged through the EY Parthenon work. A fuller exercise may have provided stronger evidence on market appetite, risk allocation and deliverability. However, this has to be weighed against the wider evidence now available, including the cost premium identified by Scottish Water, the challenges of transferring construction risk, and the uncertainty around achieving and maintaining off-balance-sheet classification.

4.6.33. We are satisfied that Scottish Water has considered a MIM as part of the project appraisal for WCB. Scottish Water has provided evidence on cost, market appetite, risk allocation and classification risk, and its Board has approved the proposal not to deliver WCB through a MIM. On the evidence currently available, we consider Scottish Water's conclusion that self-funded delivery is the preferable option for customers to be reasonable.

4.6.34. On this basis, we have made a conditional allowance for a self-funded delivery of West Central Bioresources within the investment programme, subject to the cost challenges outlined above and in the section on operating expenditure in the main Draft Determination document. While WICS remains open to considering alternative funding and delivery models at a strategic level in future SRCs, we do not consider that the evidence supports further development of a MIM for WCB.

### Assessment of costing

4.6.35. WSP has a high confidence that Scottish Water has used an appropriate approach for developing the WCB costs and that the cost estimates themselves are appropriate for this stage in planning and scheme design. The proposed AAD technology is industry-leading in

efficiency of required infrastructure. WSP reviewed the benchmarking analysis of Cumming Group commissioned by Scottish Water.[201] According to that analysis, only a portion of the WCB scope is comparable to industry benchmarks and the cost of it is lower than the industry average under both benchmarking methods (comparing costs per unit (ttDS/year), and comparing using a cost equation (line of best fit)). WSP suggested adding two new data points to the line-of-best-fit analysis to improve the comparison. Cumming Group implemented the suggestion and the updated analysis also showed that the lower end of WCB's comparable costs is below or in line with the comparators.

4.6.36. WSP also reviewed Scottish Water's 'Latest Best Estimates' unit-based approach for estimating WCB costs. The consultants noted that the direct construction and construction risk costs appear appropriate; however, they considered that several cost items are high: the indirect or 'on costs', the costs for Electrical, Control and Instrumentation and the costs for motor control centres, which are part of electrical costs. The itemised list of costs included a mix of higher and lower-than-expected costs.

4.6.37. WSP further noted that costs for the WCB scheme have increased over time, but this is to be expected given the nature of the project and prevailing market conditions. The unit processes required for successful project delivery are tried and tested, and risks of cost escalation understood and appropriately reflected in the final budget. Cost (and risk) management will be a fundamental component of the project delivery process and will require appropriate oversight.

4.6.38. In conclusion, we consider that the £420 million cost estimate in the business plan (excluding £140 million in upgrades to other wastewater treatment works to enable the export of biosolids to the new treatment centre) appears to be in line with available benchmarks; however, the facility's design is still under development, so there is some uncertainty about the final cost estimate before construction commences. We therefore require Scottish Water's cost estimate in the Stage 4 Project Investment Appraisal before the project proceeds.

4.6.39. There is also uncertainty over whether Scottish Water will be able to offset some of the costs of WCB. In recent months, Scottish Water has also highlighted the opportunity to apply for funding through the Green Gas Support Scheme (GGSS), which provides financial incentives for new anaerobic digestion plans to inject gas into the UK grid. Such incentives would reduce the costs to customers.

[201] Cumming Group (2025), 'Scottish Water: Daldowie Bioresources. Project Level Benchmarking Completion Report', 16 December 2025, submitted with the final business plan on 26 February 2026.

4.6.40. Our concerns about the uncertainties around the cost estimates are one of the main reasons we propose to apply a conditional price cap for the WCB project as explained in Chapter 8 of the main Draft Determination document.

### Assessment of other requirements from the policy position

4.6.41. This sub-section outlines our assessment for the remaining requirements from the Scottish Government's policy position:

- Compliance with HM Treasury's Green Book;
- Alignment with Scottish Government's Infrastructure Investment Plan and draft Bioenergy Policy Statement;
- Alignment with the circular economy strategy and achievement of net zero emissions by 2045;
- Alignment with the Scottish Public Finance Manual (SPFM), in particular the section on funding and procuring and governance arrangements;
- Alignment and integration with existing policies and plans at the national, regional and local level, e.g. National Planning Framework 4; and
- Compliance with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017.

4.6.42. Regarding compliance with HM Treasury's Green Book, our engineering consultants consider that Scottish Water has largely completed the analysis and justification for the WCB business case as recommended by the HM Green Book; however, that is not presented in a comprehensive format as per the Green Book guidance, e.g. not all relevant information and analysis is collated into one document, but it is spread over multiple documents. Since this appears to be a formatting rather than a content issue, we are satisfied that all relevant Green Book information requirements are met.

4.6.43. We gain assurance from WSP's analysis that the proposed WCB solution appropriately aligns with the Scottish Government's draft Bioenergy Policy Statement and draft Infrastructure Strategy (2027-2037) and with the Town and Country Planning Regulations 2017 which require the use of Environmental Impact Assessments. Scottish Water has explained in TA010 how it is addressing the EIA requirements. This has included receiving advice from Glasgow City Council on the required contents of the EIA submission and receiving feedback from statutory consultees on the screening process. This and other information will be (or by the time our Draft Determination is published, has already been) submitted to Glasgow City Council seeking its scoping opinion. Once that is received, Scottish Water estimates it would need 4-8 months to complete the EIA.[202] As such, we consider this requirement is in the process of being addressed. We plan to make the completion of all necessary impact

[202] Scottish Water (2026) 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.59.

assessments and receipt of necessary consents and approvals a condition of the conditional charge cap.

4.6.44. There is very limited coverage by Scottish Water of how the options align with policies and plans at the national, regional and local levels, including the National Planning Framework 4. This is summarised in section 2.1 'Regulatory and Policy Context' in technical appendix 10 which outlines alignment with the waste hierarchy within Waste (Scotland) Regulations 2012 and related SEPA guidance, the Scottish Government's draft Bioenergy Policy Statement, Scottish Government's draft Circular Economy Strategy, national policy objectives under EASR, recommendations by the UK Climate Change Committee. We require Scottish Water to explain how it has met this requirement of the Ministerial policy position.

4.6.45. In the Stage 1 PIA Appendix 5, Scottish Water maps how this project contributes to the SRC21 Ministerial Objectives for supporting sustainable growth (by providing sufficient additional capacity and headroom for growth to 2040), for circular economy (by recovering as much benefits as economically possible from bioresources though the improved treatment technology), and for climate change (by adopting an AAD solution which requires less energy and emits less carbon thus lowering emissions). Scottish Water also claims that the WCB project will be a key enabler in achieving its target for net zero emissions by 2040.[203] This is also evidenced by the significant reduction in calculated whole-life (60-years) carbon emissions from nearly 2.5 million tCO2e of the Business-As-Usual option of using driers and liming (without carbon capture) down to 0.6 million tCO2e of the proposed solution.[204] As such, we consider that the project meets the requirements to support the circular economy strategy and help to achieve the 2045 net zero target.

4.6.46. We consider that the WCB project aligns with the Scottish Government's Infrastructure Investment Plan (IIP) at a high level. The IIP covers three strategic themes for guiding investment decisions in Scotland:

- Enabling the transition to net zero emissions and environmental sustainability;
- Driving inclusive economic growth; and
- Building resilient and sustainable places.

4.6.47. The IIP also introduces a new Scottish Government Investment Hierarchy which prioritises enhancing and maintaining assets over new build:

- Determine future need;
- Maximise the useful life of existing assets.
- Repurpose & Co-locate; and

[203] Scottish Water (2025), 'Stage 3a: Outline Investment Appraisal. Level 1. West Central Bioresource', June 2025, p.12, submitted with the final business plan on 26 February 2026.
[204] Scottish Water (2026) 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.38.

- Replace, Create or Build New Assets.

4.6.48. Scottish Water has evidenced that it has considered these factors.

4.6.49. In terms of alignment with the SPFM sections on funding and procuring and on governance arrangements for major investment projects, we consider that Scottish Water has partially met the requirements. Each of these two sections is examined below.

4.6.50. Regarding funding and procuring, the SPFM explains that major investment projects should be compliant with the SPFM sections on 'Procurement' and on 'Non-profit distributing public private partnerships', and that the project's business case should fully reflect the options for delivery and their assessment. We cannot comment in detail on how well Scottish Water is aligning to the 'Procurement' section requirements as the funding method has not been confirmed (self-delivery or through a MIM) and as such procurement has not begun.[205]

4.6.51. We consider that Scottish Water has met the SPFM requirements in section 'Non-profit distributing public private partnerships' which are applicable at this stage of the appraisal process when the delivery mode is yet to be confirmed. Namely, the WCB appraisal has considered a MIM as a type of public-private partnership, and Scottish Water has received expert advice on the suitability of a MIM for WCB. Scottish Water has also documented and evidenced the reasons why it is not proposing to deliver WCB through a MIM, and this proposal has been approved by its Board as part of the business plan submission. The other requirements in the NPD PPP section relate to the project management and accounting rules for such partnerships, which are not applicable to WCB at this stage of the appraisal.

4.6.52. We consider that the requirement for delivery options assessment within the business case has been met through Scottish Water's assessment of the applicability and viability of an MIM delivery, which is summarised in section 4 'Financial Case' of technical appendix 10 and compared against a self-funded delivery.

4.6.53. If the project is jointly funded, the SPFM outlines additional requirements that we do not consider relevant for WCB at this stage, as the delivery mechanism has yet to be confirmed.

4.6.54. Regarding governance arrangements, the SPFM outlines 3-4 key roles:

- Investment Decision Maker;
- Senior Responsible Owner (SRO) – accountable for meeting the project objectives, delivering the outcomes and realising the required benefits. The SRO is the owner of the business case and accountable for all aspects of governance;

[205] SPFM requirement examples include delegated authorities, separation of duties between the budgetary authority and procurement authority, contract management and use of consultants, etc. These would be governed by Scottish Water-wide processes. SPFM refers to separate policies and guidelines such as the Scottish procurement policy handbook and the client guide to construction projects.

- Project Sponsor (Optional); and
- Project Manager.

4.6.55. Scottish Water has outlined in technical appendix 10 the governance structure applicable to WCB, including the roles, responsibilities and membership of each governance group.[206] Based on the descriptions, we consider that Scottish Water's structure closely aligns with the SPFM requirements; however, Scottish Water has not provided sufficient information to fully confirm alignment. Our understanding is that the following is true:

- The Sponsor Group, consisting of Scottish Water Executive decision makers (and led by the Director of Capital Investment), acts as the Investment Decision Maker. We understand this to be Scottish Water's Investment Group, which is responsible for approving WCB's Project Investment Appraisals before the project is ultimately approved by the Board due to its large capital value;
- The Senior Responsible Owner (SRO)/Project Sponsor is Scottish Water's Wastewater Strategy General Manager, who has signed off each of the project investment appraisals for submission to Scottish Water's Investment Group; and
- The WCB Project Board (consisting of project managers, supply chain leads and technical teams) acts as the Project Manager and ensures the execution of project workstreams and deliverables.

4.6.56. SPFM further requires that "Project roles, responsibilities and delegated authorities must be clearly identified, agreed and documented in formal letters of appointment between the IDM and the SRO (see supporting documents and the SRO appointment letter), and between the SRO and the various post holders within the project's management structure. The roles must be set out in the project's business case and be subject to scrutiny as part of the appropriate project approvals process". WICS cannot comment on whether that is the case as Scottish Water has not provided this level of detail within its final business plan or WCB business case documents, which only include a high-level explanation of the relevant governance groups and their roles.

4.6.57. In conclusion, we consider that the requirements for alignment with the SPFM sections on funding and procuring and on governance arrangements for major investment projects are largely met, subject to confirming that the project roles, responsibilities, and delegated authorities are clearly identified, agreed, and documented, with roles set out in the investment case. We require Scottish Water to set this out in the final investment case.

[206] Scottish Water (2026) 'SR27 Final Business Plan: Technical Appendix 010 – West Central Bioresources', 26 February 2026, p.60.

### Assurance

4.6.58. Table 120 below summarises our assessment and draft assurance against each of the requirements from Scottish Government's policy statement detailed in Table 119 above.

4.6.59. Our assessment is colour-coded as follows.

- Green: requirement met;
- Amber: requirement partially met or in progress; and
- Red: requirement not sufficiently met.

4.6.60. Overall, WICS considers Scottish Water has met the majority of requirements so far; however, there are several areas which require further evidence from Scottish Water between the Draft Determination and the Final Determination. We will provide our final assurance statement as part of the Final Determination.

*Table 120: WICS draft assurance against Scottish Government's requirements*

| Requirement from policy statement | WICS assurance | Assurance commentary |
|---|---|---|
| Consider how options can support the Just Transition (Grangemouth) | Requirement met | We consider that Scottish Water has sufficiently demonstrated it has appropriately considered Grangemouth (or Kinneil Kerse in immediate proximity) as a site for the AAD facility to support the Scottish Government's Just Transition plan for that industrial cluster. The proposed solution can also produce precursors for Sustainable Aviation Fuel (SAF) for onward transport to Grangemouth for upgrading or refining. |
| Align with HM Treasury's Green Book | Requirement met | While the appraisal is not presented as a traditional Green Book investment case, all relevant Green Book information requirements are met. |
| Align with Infrastructure Investment Plan and draft Bioenergy Policy Statement | Requirement met | We consider the proposed solution to be aligned with the relevant IIP strategic themes and largely aligned with the IIP investment hierarchy. We also gain assurance from our engineering consultant's review that the proposed WCB solution appropriately aligns with the Scottish Government's draft Bioenergy Policy Statement and draft Infrastructure Strategy (2027-2037) |
| Support the circular economy strategy and achieving the 2045 net zero target | Requirement met | The primary investment need to be addressed by the WCB project is to maximise the value from bioresource, which is a core principle of a circular economy and will support Scottish Water in achieving its net zero target through energy generation and lowering carbon emissions. |
| Align with SPFM section 'Funding and procuring' for major investment projects | Requirement partially met | We consider this is largely met, subject to Scottish Water confirming that the project roles, responsibilities, and delegated authorities are clearly identified, agreed, and documented, with roles set out in the investment case. On this basis, we consider this element partially met at this stage.<br><br>The WCB appraisal has considered a MIM as a type of public-private partnership, and Scottish Water has received expert advice on the suitability of a MIM for WCB. Scottish Water has also documented and evidenced the reasons why it is not proposing to deliver |

| Requirement from policy statement | WICS assurance | Assurance commentary |
|---|---|---|
| | | WCB through a MIM, and this proposal has been approved by its Board as part of the business plan submission. |
| Consider delivery through a MIM | Requirement met | As above. WICS is assured that Scottish Water has undertaken appropriate detailed analysis of the costs and risks associated with a MIM delivery option, based on which it concludes self-delivery is the preferable option. Overall, we consider that Scottish Water's assessment that self-funded delivery is in customers' best interests is reasonable. |
| Represent Value for Money | Requirement partially met | The cost estimate in the business plan appears to be in line with available benchmarks; however, the facility's design is still under development, so there is some uncertainty over the final scope and project costs. This is one of the reasons for adopting a conditional charge cap for this project. |
| Consider economic impact (whole-life costs and how capital costs can be shared between current and future customers) | Requirement met | Scottish Water's analysis includes estimates of capital and operating costs over 60 years in a whole-life cost calculation for both self-funded delivery and MIM delivery, as options for sharing capital costs between current and future customers. |
| Consider qualitative or quantitative wider economic benefits | Requirement partially met | Scottish Water has demonstrated that it has considered the whole-life (60-year) carbon values of the 5 main technical solution options, including embodied and operational emissions. However, there seems to be a limited number of other, broader, non-financial economic benefits considered beyond energy capture and generation. |
| Assess integration with existing policies and plans at the national, regional and local level (e.g. National Planning Framework 4) | Requirement not sufficiently met | Overall, Scottish Water's coverage is high-level and limited. We require Scottish Water to explain how it has met this requirement of the Ministerial policy position in response to our Draft Determination. |
| Environmental Impact Assessment | In progress | Scottish Water is currently developing the required EIA and expects to complete it in the second half of 2026. We plan to make the completion of all necessary impact |

| Requirement from policy statement | WICS assurance | Assurance commentary |
|---|---|---|
| | | assessments and receipt of necessary consents and approvals a condition of the conditional charge cap. |
| Align with SPFM section 'Governance' for major investment projects | Requirement partially met | We consider that this is largely met, subject to confirming that the project roles, responsibilities, and delegated authorities are clearly identified, agreed, and documented, with roles set out in the investment case. On this basis, we consider this element partially met at this stage. However, we require Scottish Water to set this out in the final investment case[207] and in response to our Draft Determination. |

[207] We consider this to be the Stage 4 Project Investment Appraisal.

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WICS Economic regulation for Scotland's water