

SCOPE OF WORK

PFAS Treatment Feasibility Study

City of Coburg Water System — PWS ID 4100200

Prepared for Branch Engineering, Inc., on behalf of the City of Coburg

Prepared by ESSI

August 2026

1. Introduction and Background

In July 2026, the Oregon Health Authority (OHA) notified the City of Coburg (the City; PWS ID 4100200) that a sample collected on April 15, 2026 as part of the OHA PFAS Sampling Project detected per- and polyfluoroalkyl substances (PFAS) at the entry point serving Wells No. 1 and No. 2 (EP-A). PFOS and PFOA were detected above the federal Maximum Contaminant Levels (MCLs) of 4.0 parts per trillion (ppt) established by the U.S. Environmental Protection Agency (EPA) in April 2024. The reported results are summarized below.

PFAS Analyte	Detected Concentration (ppt)	Federal MCL
PFOS	11.4	4.0 ppt
PFOA	6.22	4.0 ppt
PFHxS	3.66	10 ppt
PFBS	4.22	Regulated under the Hazard Index MCL
PFHxA	2.74	Not established
PFPeA	2.37	Not established

In addition to the individual MCLs, EPA established a Hazard Index MCL of 1 (unitless) for mixtures of four PFAS (PFHxS, PFNA, HFPO-DA (GenX), and PFBS). The Hazard Index calculated for the mixture detected at Coburg is approximately 0.4, below the MCL of 1.

The April 15, 2026 sample was collected under the OHA PFAS Sampling Project and counts as the City's first initial-monitoring sample under the federal PFAS drinking water rule. The City must collect a second initial-monitoring sample in September–November 2026, and ongoing compliance monitoring begins after April 26, 2027. Compliance with the PFAS MCLs will be based on a running annual average (RAA) of quarterly compliance monitoring results; if the RAA exceeds an MCL, corrective action is required to reduce levels below the MCLs by April 2029. While compliance with the PFAS MCLs is not yet required, OHA has advised the City that these results indicate Coburg may eventually exceed the MCLs for PFOS and PFOA, and OHA has encouraged the City to apply for Emerging Contaminants (EC) funding now rather than wait for confirmation sampling.

Coburg is a small water system (approximately 647 connections), and absorbing the planning, design, and construction costs of PFAS mitigation through rates alone would be a significant financial burden on the community. The proposed feasibility study will evaluate viable alternatives for removing PFAS from the drinking water supplied through the entry point serving Wells No. 1 and No. 2, including treatment technologies, operational modifications, and associated capital and lifecycle costs. The study will provide the technical basis needed to identify the most effective and financially sustainable solution, position the City to pursue future design and construction funding, and ensure the continued delivery of safe, reliable drinking water to the Coburg community.

Project team. The City has retained Branch Engineering, Inc. (Branch), serving as the City’s Acting City Engineer, to manage the feasibility study and provide project management and civil and structural engineering support. ESSI will support the feasibility effort as a specialty subconsultant to Branch, providing PFAS treatment expertise, leading the treatment alternatives evaluation, and preparing the feasibility study. ATEC Water Systems (ATEC) will conduct Rapid Small-Scale Column Testing (RSSCT) and the associated PFAS laboratory analyses under a separate contract. This Scope of Work covers ESSI’s services.

2. Objectives

The objectives of the feasibility study are to:

- Characterize source water quality, including the competing background constituents that govern treatment media service life and, therefore, lifecycle cost.
- Evaluate PFAS treatment technologies head-to-head on Coburg’s actual water through bench-scale RSSCT testing conducted by ATEC.
- Develop and compare treatment alternatives—including residuals and spent-media management—on the basis of capital, operations and maintenance (O&M), and lifecycle costs.
- Identify the most effective and financially sustainable PFAS mitigation approach for the City.
- Deliver a feasibility study suitable for submittal to the City, OHA, and Business Oregon that positions the City to pursue design and construction funding.

3. General Approach

The study will evaluate PFAS treatment technologies including granular activated carbon (GAC), PFAS-selective single-use ion exchange (IX) resin, and novel media such as surface-modified clay (SMC) media, along with a screening-level evaluation of high-pressure membranes (nanofiltration/reverse osmosis). The RSSCT program conducted by ATEC will compare the GAC, IX, and SMC media head-to-head on Coburg’s actual water. Water quality characterization—the full PFAS panel plus the competing background ions—will feed directly into RSSCT interpretation, media service-life projections, and lifecycle cost estimates. Residuals and spent-media management will be evaluated as part of the alternatives analysis, as it is often the deciding factor between GAC and IX at small-system scale.

Bench-scale testing and the associated laboratory analyses are being conducted as part of this feasibility study, consistent with the EC funding program’s eligibility for non-routine testing performed as part of a feasibility study addressing the contaminant of concern.

4. Scope of Work

Task 1 — Kickoff, Data Review, and Water Quality Characterization (Months 1–2)

- Conduct a project kickoff meeting with Branch and City staff to confirm objectives, schedule, roles, and data needs; issue a data request.
- Review available information, including the OHA/DEQ analytical results, well construction and production records, water system information, and prior planning documents.
- Complete a water quality characterization of the source water, including the PFAS panel (EPA Method 533 or 537.1 at an ORELAP-accredited laboratory) along with total organic carbon (TOC), sulfate, nitrate, chloride, alkalinity, and iron/manganese. Competing background ions drive media service life and therefore lifecycle cost; these results feed directly into the RSSCT interpretation.
- Incorporate the results of the City’s second initial-monitoring sample (September–November 2026) and any subsequent compliance monitoring data into the design basis as they become available.
- Establish the treatment design basis (design flows, well operation, water quality, and treatment goals).

Task 2 — RSSCT Bench-Scale Testing Support and Interpretation (Months 2–5)

- ATEC, under separate contract, will conduct the RSSCT program: three column tests comparing GAC, PFAS-selective single-use IX resin, and SMC media on Coburg’s actual water, with the associated laboratory analyses included.
- Provide input to the RSSCT test plan and coordinate with ATEC on water collection and shipment, test conditions, and analytical schedule.
- Review RSSCT results (including analytical turnaround), interpret breakthrough data, and project full-scale media service life and replacement frequency for each media.

Task 3 — Treatment Alternatives Development and Cost Evaluation (Months 5–7)

- Develop conceptual treatment alternatives for GAC, IX, and SMC media informed by the RSSCT results, together with a screening-level evaluation of high-pressure membranes (NF/RO) and potential operational modifications.
- Evaluate residuals and spent-media management for each alternative, including spent GAC reactivation versus disposal and spent resin disposal.
- Develop conceptual layouts and identify site, utility, and constructability considerations in coordination with Branch.
- Prepare capital cost, annual O&M cost, and lifecycle (present-worth) cost estimates for each alternative, and compare the alternatives in a decision matrix with a recommended approach.

Task 4 — Feasibility Study Report (Months 8–9)

- Prepare the feasibility study following the anticipated report outline presented in Attachment A, which reflects the anticipated level of effort for the report.
- Prepare a draft feasibility study and submit it to the City, Branch, and OHA for review (Month 8).

- Address consolidated review comments and issue the final feasibility study (Month 9).
- The final feasibility study will be signed and stamped by a professional engineer licensed in the State of Oregon, consistent with SDWRLF/EC program requirements for subsequent design and construction funding.

Task 5 — Project Management and Meetings (Months 1–9)

- Provide monthly progress updates and invoicing to Branch.
- Attend up to three project meetings (kickoff, alternatives review workshop, and draft study review), held virtually or in person.
- Coordinate with OHA Drinking Water Services and Business Oregon as needed to support the study.

5. Deliverables

Deliverable	Timing (from NTP)
RSSCT test plan input and review comments (with ATEC)	Month 2
Water quality characterization and design basis summary	Month 3
RSSCT results interpretation and media service-life projections	Month 6
Draft Feasibility Study (to City, Branch, and OHA)	Month 8
Final Feasibility Study (signed and stamped)	Month 9

6. Schedule

Per the EC program application instructions, a funding award and contract execution may take up to one year following the August 15, 2026 application deadline, and planning projects must be completed within 24 months of contract execution. Project milestones are therefore keyed to the notice to proceed (NTP) rather than calendar dates.

Activity	Timing (from NTP)
Kickoff, data review, and water quality characterization	Months 1–2
RSSCT bench testing (including analytical turnaround)	Months 2–5
Alternatives development, capital and lifecycle costs	Months 5–7
Draft feasibility study to City/OHA	Month 8
Final feasibility study	Month 9

If estimated calendar dates are required, contract execution around mid-2027 would place draft feasibility study completion in early 2028 and the final study well within the 24-month completion window.

7. Budget

ESSI's fee for the services described in this Scope of Work is \$45,000. For context, the total planning budget for the feasibility study, including ATEC's bench-scale testing under separate contract, is summarized below.

Item	Fee
ESSI — PFAS Treatment Feasibility Study (Tasks 1–5, this Scope of Work)	\$45,000
ATEC — RSSCT bench-scale testing (three column tests; laboratory analyses included; provided under separate contract)	\$25,000
Total Planning Budget	\$70,000

The feasibility study is proposed for funding under Oregon's Safe Drinking Water Revolving Loan Fund Emerging Contaminants program (100 percent forgivable loan funds). A \$5,000 project management allowance for grant administration is carried separately in the City's funding application and is not part of the fees shown above.

8. Assumptions and Exclusions

- ATEC's RSSCT testing, including the associated laboratory analyses, will be performed under a separate contract and is not included in ESSI's fee.
- City staff will provide access to wells, records, and water system data, and will assist with sample collection for the water quality characterization.
- Branch will provide overall project management, civil and structural engineering support, and coordination with the City as the City's Acting City Engineer.
- Compliance monitoring, including collection of the second initial-monitoring sample (September–November 2026), remains the City's responsibility; the study will incorporate those results as they become available.
- This scope excludes final design, permitting, bidding, and construction-phase services, which would be provided under separate authorization if the City proceeds with a selected alternative.
- Environmental review (SERP), labor standards monitoring (Davis-Bacon), and Build America, Buy America compliance are construction-phase requirements and are excluded from this planning scope.
- The schedule assumes timely receipt of RSSCT results and laboratory analytical turnaround.

Attachment A — Anticipated Feasibility Study Report Outline

The feasibility study report is anticipated to follow the outline below, which is modeled on comparable PFAS treatment feasibility reports and reflects the level of effort included in this Scope of Work. The outline will be refined with City, Branch, and OHA input during the study.

Executive Summary

- Summary of findings, recommended alternative, estimated capital and annual O&M costs, projected media replacement frequency, and conceptual site arrangement.

1. Introduction and Background

- Water system overview and PFAS detections at the entry point serving Wells No. 1 and No. 2.
- PFAS in drinking water: sources, occurrence, and overview of health effects.
- Regulatory framework: EPA PFAS Rule MCLs and Hazard Index; Oregon initial and compliance monitoring requirements; compliance timeline (running annual average; corrective action by April 2029).

2. Description of Existing System and Sites

- Wells No. 1 and No. 2, entry point configuration, existing facilities, and available siting considerations for treatment.

3. Water Quality Characterization and Planning Criteria

- PFAS panel and background water quality (TOC, sulfate, nitrate, chloride, alkalinity, iron/manganese) and implications for treatment.
- Design flows, well operation, and treatment objectives.

4. Treatment Technology Overview

- Granular activated carbon (GAC), including media types.
- PFAS-selective single-use ion exchange (IX) resin.
- Novel media, including surface-modified clay (SMC).
- High-pressure membranes (NF/RO) — screening-level discussion — and other emerging technologies.

5. Bench-Scale (RSSCT) Testing Program and Results

- Test plan, methods, and water quality during testing.
- Breakthrough results for GAC, IX, and SMC media.
- Projected full-scale media service life and replacement frequency.

6. Evaluation of Alternatives

- Development of treatment alternatives (GAC, IX, SMC) and potential operational modifications.
- Residuals and spent-media management: spent GAC reactivation versus disposal; spent resin disposal.
- Comparison of alternatives — performance, costs, and non-cost factors — and recommended alternative.

7. Conceptual Design of Recommended Alternative (Basis of Design)

- Proposed site arrangement and conceptual layout.
- Treatment vessels, media, and hydraulic criteria.
- Backwash/residuals handling, utility, and system integration considerations.

8. Cost Estimates

- Capital cost, annual O&M cost, and lifecycle (present-worth) cost for each alternative and the recommended alternative.

9. Implementation Schedule and Funding Strategy

- Anticipated design, permitting, and construction sequence; positioning for EC design and construction funding.

10. References

Appendices

- Laboratory analytical reports; RSSCT data and breakthrough curves; cost estimate detail.

SCOPE OF WORK

PFAS Treatment Feasibility Study: Project Management, Civil, and Structural Services

City of Coburg Water System (PWS ID 4100200)

Prepared for the City of Coburg

Prepared by Branch Engineering, Inc., Acting City Engineer

August 2026

Supplement to the ESSI Scope of Work (August 2026)

1. Purpose and Reference

This Scope of Work describes the services provided by Branch Engineering, Inc. (Branch) as the City of Coburg's Acting City Engineer for the PFAS Treatment Feasibility Study. It is supplementary to, and should be read together with, the Scope of Work prepared by ESSI dated August 2026, which is submitted with the City's Emerging Contaminants (EC) funding application. The PFAS detection history at the entry point serving Wells No. 1 and No. 2, the regulatory framework and compliance timeline, the study objectives, and the general treatment approach are described in the ESSI Scope of Work and are not repeated here.

Project team. The City has retained Branch to serve as its Acting City Engineer and to lead and manage the feasibility study, providing overall project management, civil engineering, structural assessment, and coordination among the City and the project team. Branch will retain ESSI as a specialty subconsultant to provide PFAS treatment expertise, lead the treatment alternatives evaluation, and prepare the feasibility study. ATEC Water Systems (ATEC) will conduct Rapid Small-Scale Column Testing (RSSCT) and the associated PFAS laboratory analyses. This Scope of Work covers Branch's services, including the project management, civil, and structural engineering support Branch provides as Acting City Engineer and its administration of the subconsultant team.

2. Branch Role and Objectives

Branch's objectives for its services on the feasibility study are to:

- Serve as the City's Acting City Engineer and provide overall project management and coordination for the feasibility study, keeping the effort on scope, schedule, and budget.
- Coordinate the project team (including specialty subconsultant ESSI & testing firm ATEC) and the City and administer the subconsultant scope.
- Evaluate site civil conditions and identify constraints that affect siting of PFAS treatment at the entry point serving Wells No. 1 and No. 2.
- Provide a structural assessment of the existing well house and/or proposed treatment building to inform conceptual siting, equipment layout, and constructability.
- Provide civil and structural engineering support to ESSI's treatment alternatives evaluation and conceptual layouts and oversee the feasibility study so that it is suitable for submittal to the City, OHA, Business Oregon, and EC funding program.

3. Scope of Work

Branch’s work on the feasibility study falls into three areas that run concurrently across the study: leading and administering the project as the City’s Acting City Engineer, carrying out the site civil and structural evaluation, and reviewing the completed study before it goes to the City and the funding agencies. ESSI’s Scope of Work covers the treatment technology evaluation, RSSCT interpretation, and preparation of the report itself; the tasks below describe only Branch’s contribution.

Project management and team coordination. Branch serves as the City’s Acting City Engineer and the single point of contact for the study, holding responsibility for scope, schedule, and budget from notice to proceed through delivery of the final report. This includes retaining and administering ESSI’s subconsultant agreement, coordinating ATEC’s bench-scale testing schedule and sample logistics with ESSI, and pulling both firms’ work into one coordinated effort for the City. Branch will convene the kickoff, facilitate the alternatives review once RSSCT results are available, and lead the draft-study review, along with monthly progress reporting, invoicing, and any required coordination with OHA Drinking Water Services, Business Oregon, and the EC funding program.

Site civil and structural evaluation. This is the core of Branch’s technical contribution and the part of the study that will be grounded at the site itself. Working from available survey, utility, and record drawings, Branch will assess what it would actually take to place PFAS treatment at the entry point serving Wells No. 1 and No. 2: how much usable footprint exists, how equipment would be accessed and served by power and yard piping, how the site drains, and what setbacks and wellhead-protection boundaries come into play. In parallel, Branch will look at the existing well houses, and at a new treatment building if one is contemplated, to judge whether either can carry the weight of treatment vessels and media and what modifications a given alternative would demand. These findings feed straight into ESSI’s conceptual layouts and cost estimates. The structural work is a conceptual, non-destructive review; it does not include destructive testing, detailed structural analysis, or geotechnical investigation.

Feasibility study review and oversight. As Acting City Engineer, Branch reviews the draft and final feasibility study for completeness and for consistency with the City’s objectives and the SDWRLF/EC program requirements, confirms that the site constraints it identified are carried through the alternatives comparison and conceptual design, and supports submittal of the final study to the City, OHA, Business Oregon, and EC program.

4. Deliverables

Deliverable	Timing (from NTP)
Project management, meeting facilitation, and monthly progress updates	Months 1–9
Site civil evaluation and constraints evaluation	Month 6
Structural assessment (well house / treatment building)	Month 6
Civil and structural input to conceptual layouts and cost estimates	Month 7
Review comments on the draft feasibility study	Month 8
Oversight and concurrence on the final feasibility study	Month 9

5. Schedule

Consistent with the ESSI Scope of Work, Branch's milestones are keyed to the notice to proceed (NTP) rather than calendar dates, reflecting that a funding award and contract execution may take up to one year following the August 15, 2026, application deadline and that planning projects must be completed within 24 months of contract execution.

Activity	Timing (from NTP)
Project management and coordination	Months 1–9
Subconsultant management and coordination	Months 1–9
Site civil evaluation and constraints	Months 2–6
Structural assessment of well house / treatment building	Months 2–6
Feasibility study oversight and review	Months 7–9

6. Budget

Branch's fee for the services described in this Scope of Work, together with the subconsultant scope Branch administers, is summarized below.

Item	Fee
Branch: Site civil engineering and project management	\$27,000
Branch: Structural assessment of well house / treatment building	\$7,500
Subconsultant scope & Subconsultant coordination fee (10% added to subconsultant scope: ESSI PFAS treatment feasibility study, \$45,000; ATEC RSSCT bench-scale testing, \$25,000)	\$77,000
Total Branch Scope	\$111,500

The subconsultant scope of \$70,000 comprises ESSI's \$45,000 fee and ATEC's \$25,000 bench-scale testing budget, as detailed in the ESSI Scope of Work. The 10 percent subconsultant coordination fee (\$7,000) covers Branch's administration and coordination of the subconsultant team, bringing the marked-up subconsultant total to \$77,000. Combined with Branch's civil, project management, and structural services, the total Branch scope is \$111,500.

The feasibility study is proposed for funding under Oregon's Safe Drinking Water Revolving Loan Fund Emerging Contaminants program. A \$5,000 project management allowance for grant administration is carried out separately in the City's funding application and is not part of the fees shown above.

7. Assumptions and Exclusions

- ESSI's PFAS treatment feasibility services and ATEC's RSSCT testing are performed under subconsultant arrangements administered by Branch; the detailed scopes for ESSI and ATEC are defined in their respective scopes of work.
- The subconsultant scope total of \$70,000 reflects the amounts in the ESSI Scope of Work (ESSI, \$45,000; ATEC, \$25,000); the 10 percent Branch coordination fee applies to that total.

- City staff will provide access to the wells, well house, records, survey and utility information, and water system data needed for the civil and structural evaluations.
- The structural assessment is a conceptual, non-destructive evaluation based on available record information and a site visit; it does not include destructive testing, detailed structural analysis, or geotechnical investigation.
- This scope covers planning-level civil and structural evaluation and study oversight only; it excludes final design, permitting, bidding, and construction-phase services, which would be provided under separate authorization if the City proceeds with a selected alternative.
- Environmental review (SERP), labor standards monitoring (Davis-Bacon), and Build America, Buy America compliance are construction-phase requirements and are excluded from this planning scope.
- A \$5,000 project management allowance for grant administration is carried out separately in the City's funding application and is not part of the fees shown above.
- The schedule is keyed to the notice to proceed and assumes timely receipt of subconsultant deliverables and City input.