

EXHIBIT A

SCOPE OF WORK ENGINEERING SERVICES FOR PORTLAND TO SANDY WATER FILTRATION PLANT TRANSMISSION SYSTEM CITY OF SANDY, OREGON

This scope of work details proposed services to be provided to the City of Sandy (City) for the Portland to Sandy Water Filtration Plant Transmission System Project (Project) by Consor North America, Inc. (Consultant), including engineering design and bid period and construction phase services.

Introduction & Background

The City of Sandy, Oregon (City), is executing a large Program to upgrade its water supply, transmission, distribution and treatment facilities. The Sandy Drinking Water Reinvestment Program (SDWRP) will stabilize the City's drinking water supply through a new connection to the Portland Water Bureau (PWB) Bull Run Supply at the proposed Bull Run Filtration Facility, construct a new pump station and transmission pipeline to convey filtered water from the Bull Run Filtration Facility to re-connect to the Hudson Transmission Main, as well as make various reliability upgrades and replacement components at the City's Alder Creek Water Treatment Plant.

This Project will provide engineering design, bidding and construction phase services necessary to construct certain elements of the new Portland to Sandy Water Filtration Plant Transmission System. The City is currently negotiating with PWB with the intent to have PWB design, construct, own and operate the proposed Bull Run Supply Pump Station (BRSPS) and piping from the pump station to a meter vault located within the Bluff Road right-of-way near its intersection with Proctor Road. Currently, it is anticipated that it will be the City's responsibility to design, construct, own and operate the BRSPS at the PWB Filter Plan site and the pipeline in SE Bluff Road from SE Proctor Road to SE Hudson Road, and it will be PWB's responsibility to design, construct, own and operate pipelines extending from the BRSPS to a meter vault at SE Bluff Road and Proctor Road. PWB will also be responsible for a pipeline extending from the BRSPS to the Pleasant Home Water District (PHWD) tank site.

Therefore, the scope of work for this project will be split into two separate City projects. Bid Package No. 1 work will include professional services needed for design and construction of approximately 5,500 linear feet (LF) of 16-inch diameter ductile iron (DI) transmission pipeline in SE Bluff Road from SE Proctor Road to SE Hudson Road, with parallel electrical conduit(s) and vaults for future SandyNet fiber, and proposed water treatment facilities (WTF), consisting of chloramine removal and disinfection facilities located at the City's Revenue Avenue Reservoir site. An alternative approach to dechloramination will be reviewed involving ammonia addition at the City's other water sources, Alder Creek and Brownell Springs, to convert the City's existing disinfection systems from free chlorine to chloramines. Bid Package No. 2 work will include the proposed 5 million gallons per day (MGD) capacity BRSPS.

Project Understanding and Assumptions

The scope of work for this project will be split into Bid Package No. 1 and Bid Package No. 2 work as described below.

Bid Package No. 1 - Transmission Pipeline and WTF Work:

1. Approximately 5,500 linear feet (LF) of 16-inch diameter ductile iron (DI) transmission pipeline in SE Bluff Road from SE Proctor Road to SE Hudson Road.
2. Parallel electrical conduit(s) in the transmission main trench and vaults for future SandyNet fiber.
3. Air release and blow-off facilities along the new pipeline and the existing pipeline between SE Hudson Road and the Revenue Avenue Reservoir, to accommodate surge pressure from the new pump station.
4. Chloramine removal and disinfection facilities located at the City's Revenue Avenue Reservoir site. Alternatively, optional work will include ammonia addition at Alder Creek and Brownell Springs.
5. Following completion of the transmission system, Skyview Acres Water Company (SAWC) will receive chloraminated water from PWB through the existing connection to the Sandy transmission main in SE Bluff Road. As part of the project, improvements for serving SAWC and multiple hydrants that are currently served with pressure from the Revenue Avenue Reservoir will be made to address potential backflow of non-chloraminated water into the SAWC system. In addition, the Consultant will evaluate the option to provide fire flow from the PWB supply to SAWC via the BRSPS.

Bid Package No. 2 – BRSPS Work:

1. 5 MGD BRSP located at the PWB Filtration Plant. PWB wants the City to operate the pump station and to use it to provide water to PHWD. As such, the pumps will be dual purpose and pump through a single discharge main. The pumps will be upsized accordingly to meet PHWD flow demands.
2. It is PWB's responsibility to design, construct, own and operate a pipeline extending from the BRSPS to a meter vault at SE Bluff Road and Proctor Road, with a turnout to the Pleasant Home Water PHWD tank site, and related pressure reducing valve and metering vaults or other control valves necessary to serve PHWD.

Project Design Assumptions

1. The new SE Bluff Road Transmission Main will be located in Clackamas County (County) ROW. This scope of work assumes no new ROW or easements will be needed for the new transmission main or appurtenances.
2. It is assumed that the City will make an operational change from the current continuous year-round use of the PWB supply connected at Lusted Road, to primarily a seasonal summer peak season use of the new PWB Filtration Plant supply with a minimum use of 100,000 gallons per day during off-peak demand months. However, it is assumed that City will take over year round operations to supply PHWD from the BRSPS for PWB, and the City will recoup costs through a wheeling water agreement with PHWD. The City's water will be measured at the meter located on Bluff Road.

3. Since the City is not yet committed to dechloramination, the Consultant will perform an evaluation of capital, operations and lifecycle costs of chloramine removal compared to installing ammonia facilities at Alder Creek and Brownell Springs, and document findings in a technical memorandum.
4. The WTF will be located entirely within the existing Revenue Avenue Reservoir site. Improvements may include new outdoor granular activated carbon filter tanks, and a small building and facilities for disinfecting the dechloraminated water before it flows to the Revenue Avenue Reservoir and distribution system.
 - a. Confirm assumptions for water treatment and develop design for a 5 MGD chloramine removal and disinfection treatment facility to treat finished water from the PWB Filtration Plant.
 - b. Evaluate space requirements for operational needs and water quality testing.
 - c. Develop WTF design to include elements identified in Preliminary Design Workshops. Specific configuration and contents of building will be defined during Preliminary Design based on input received during workshops.
 - d. Evaluate and develop design for water treatment filtration residuals management and disposal, including a backwash tank and residuals handling system for the granulated activated carbon (GAC) filters residuals. This scope of work assumes backwash effluent will be pumped to the City Sandy's sanitary sewer located in Revenue Avenue or other non-sewer option. Pump size and discharge rate will be determined during Preliminary Design based on input received during workshops.
 - e. This scope of work assumes the City's existing sewer has capacity to accommodate flows.
 - f. WTF building dimensions will be developed during Preliminary Design based on input received during workshops. It is assumed that the GAC tanks will be outdoors on a slab foundation.
 - g. Assume WTF building will be reinforced concrete masonry unit (CMU) block construction with light-framed roof using manufactured trusses with gable ends and standing seam metal roofing. Building will be founded on a reinforced concrete mat slab. Architectural finishes will be designed to meet Sandy's Municipal Code.
5. It is assumed that the BRSPS will be housed in a CMU building with metal architectural siding and roof, with similar dimensions to those provided in the Stantec Conceptual Design Report. It is assumed that the pump station will also provide water to PHWD. As such, the pumps will be dual purpose and pump through a single discharge main. The pumps will be upsized accordingly to meet PHWD flow demands. . No separate rooms for lavatory or storage space will be provided.
6. It is assumed that the BRSPS will be owned and operated by the City of Sandy, and designs will be based on City design preferences and review input. As such, it is assumed that PWB staff will not be part of the City's design review process, other than for coordination with the PWB Filtration Plant design and construction.
7. It is assumed that the transmission main and WTF will be bid as a separate project from the BRSPS and alternate ammonia facilities.

8. 30% design will include a 30% Design Technical Memorandum that will document design criteria, preliminary engineering analyses, findings and recommendations, comprised of the following:
 - a. Pipe alignment evaluation along SE Bluff Road to identify the preferred location for the new pipeline within existing right of way, including coordination with the County.
 - b. Verification of surface restoration requirements along pipe alignment.
 - c. Review of soil resistivity test data to determine corrosivity of soil along pipeline and need for cathodic protection.
 - d. Analysis of locations for air valves and blow-off to avoid right of way and easement impacts.
 - e. Evaluation of the Bear Creek culvert crossing.
 - f. Vicinity map for overall project and site plan for Revenue Avenue site.
 - g. Preliminary layouts for the chloramine removal facilities at the Revenue Avenue Reservoir site, including review of the City's Development Code requirements.
 - h. Evaluation of existing sanitary sewer and non-sewer discharge alternatives to accommodate backwash discharge, including recommended approach for backwashing GAC filters.
 - i. Equipment list based on evaluation and recommendations.
 - j. Technical memo describing the electrical and control system modifications required at the site to support the new chloramine removal building and equipment.
 - k. Preliminary electrical site plan and single line diagram.
 - l. Preliminary P&ID for Chloramine Removal Facilities.
 - m. Hydraulic grade line and anticipated pump curves and system curves for the transmission system from the new pump station to the Revenue Avenue Reservoir, including available pressure for SAWC.
 - n. Transient analysis results and preliminary strategy for surge control in the new and existing transmission main.
 - o. Coordination with SAWC regarding their proposed switch to chloraminated water supply. Perform evaluation and develop recommendations for improvements for serving SAWC and multiple hydrants that are currently served with pressure from the Revenue Avenue Reservoir to address a potential backflow of non-chloraminated water into the SAWC system.
 - p. Coordination with PHWD regarding the proposed BRSPS design and operation. The Evaluations and recommendations related to potential impacts to PHWD's water quality if dechloramination facilities are located at the BRSPS site are not included in this scope of work.
 - q. Cost-loaded schedule.

- r. Opinion of Probable Construction Cost (OPCC Class 4) based on 30% design.
 - s. Permitting Plan including requirements for City Land Use permit, City and County Engineering permits, 1200C permit, OHA approval, and environmental permits.
- 9. Evaluate construction materials and equipment needed for project and provide recommendations for addressing potential schedule delays that could be caused by long lead-time items. This scope of work does not include preparing contract documents needed to procure materials outside of the single construction bid set. If procurement documents are needed to purchase certain materials ahead of the construction contract, the additional scope will be included in an amendment.
- 10. 60%, 90%, and 100% design will advance elements of 30% design to Final bid-ready construction documents including the following:
 - a. Draft Plans and Specifications for City review at 60% and 90% design levels.
 - b. A Class 3 OPCC at 60% Design, a Class 2 OPCC at 90% design, and an updated Class 2 OPCC at 100% design.
 - c. Final Plans and Specifications (stamped by an Engineer/Architect licensed in the State of Oregon) for bidding.
- 11. It is anticipated that permitting approvals may include engineering review and ROW permits from the City and the County, a 1200C (or CN) permit from DEQ or the County, and OHA approval.
- 12. Land Use Permit application and approvals for the WTF or ammonia facilities will be the responsibility of the Consultant. Land Use Permit application and approvals for the BRSPS will not be the responsibility of the Consultant. Consultant will provide technical support for the application and review processes including preparation of plans, building elevations, reports, specifications, and calculations.
- 13. It is assumed that environmental permitting will not be required for the pipeline in the road ROW, therefore environmental permitting services are not included in this scope of work. If environmental permitting services are needed, they can be provided by amendment.
- 14. Electrical, Plumbing, and other Construction Permitting will be obtained by the Contractor after bidding.
- 15. Bid Phase services will include attendance at a pre-bid meeting, responding to questions during bidding, providing up to four addenda, and assistance evaluating bids for this project.
- 16. Consultant shall coordinate with Oregon Energy Trust to appraise them of energy saving design selections that may qualify the City for grants.
- 17. Consultant shall provide "local" SCADA control only. Integration into the City's SCADA system will be performed by the City and its Program Manager.
- 18. Engineering Services during Construction (ESDCs) are not included in this scope of work but will be added by amendment after 30% design once the scope of the construction project is determined.

19. Public outreach services related to land use are not included but can be added if needed.
20. It is assumed that the power service at the City's reservoir site is adequate for small loads required for chloramine removal and disinfection facilities.
21. Topographic surveying and base mapping have been completed, and the City will provide survey files to the Consultant. If additional topographic surveying and base mapping are required, it is assumed that it will be provided by the City.
22. Geotechnical explorations have been completed for the proposed pipeline alignment and pump station at PWB Filtration Plant, and the City will provide Geotechnical Data Reports the Consultant. If additional geotechnical explorations are required it is assumed that those will be provided by the City. Geotechnical investigation and reporting for the proposed treatment facility located at the City's Revenue Avenue Reservoir site will be completed by the Consultant and are presented in this scope of work.
23. Wetlands inventories have been completed, and the City will provide Wetland Delineation Reports to the Consultant.

Scope of Services

Consultant will perform the following services.

Bid Package No. 1 - Transmission Pipeline and WTF Work:

Task 1 - Project Management

Objective

Provide overall leadership and team strategic guidance aligned with City staff objectives. Coordinate, monitor, and control the project resources to meet the technical, communication, and contractual obligations required for developing and implementing the project scope.

Subtask 1.1 - Project Management & Administration

1. Perform general administration and project management throughout the Project Design phase to provide successful completion of all tasks and elements of the Project within the established scope, schedule, and budget.
2. Prepare Project Management Plan (PMP) which includes the Consultant team structure, schedule, and quality assurance/quality control (QA/QC) Plan. The project schedule will be prepared and maintained under Subtask 1.5. The project QA/QC Plan will be prepared and maintained under Subtask 1.4.
3. Proactively track progress of project work completed against schedule & budget.
4. Prepare and maintain a project tracking log that includes a running list of project issues, key action items, key decisions and potential scope modifications during the progression of the design work.
5. Inform the City of any anticipated challenges during the Project Design phase as they may arise and develop solutions together.

6. Prepare a Health and Safety Plan to address staff safety for work in Consultant offices as well as site work on project sites during design.

Subtask 1.2 - Invoices/Status Reporting

1. Consultant will prepare monthly invoices, including expenditures by task, hours worked by project personnel, and other direct expenses with the associated backup documentation.
2. Monthly status reports will accompany each invoice and include comparisons of monthly expenditures and cumulative charges to budget by Task.

Subtask 1.3 - Project Design Meetings

1. Work under this subtask includes coordinating schedules, developing agendas, and preparing presentation materials for key project meetings during the project design phase, and includes the following meetings:
 - Project Kick-off
 - Design Workshop 1: Concepts Confirmation
 - Design Workshop 2: Site Planning & Operations Planning
 - Preliminary Design (30% Design) Review Meeting
 - 60% Design Review Meeting
 - 90% Design Review Meeting
 - Project update at City Council meeting, if requested
2. Agendas and supporting information to be distributed through the City's project manager in advance of any meeting.
3. Meeting notes to be distributed to meeting attendees and other interested parties within five (5) business days of the subject meeting date.

Subtask 1.4 - Quality Assurance/Quality Control (QA/QC)

1. Consultant will prepare a QA/QC Plan as part of Subtask 1.1 and perform and document in-house QA/QC reviews of all deliverables prior to submitting to the City.

Subtask 1.5 – Project Schedule

1. Consultant will prepare a project schedule for design, bidding, and construction activities for the duration of the project. The schedule will be updated approximately once each month during the design phase and at major deliverables. The construction schedule will be based on the Consultant's estimated construction timelines for similar projects.

Task 1 Assumptions

- Total project duration will be approximately 32 months from NTP in December 2023 through construction completion in July 2026; therefore, it is assumed that there will be up to 32 progress payments/status reports.
- Design Review Meetings will include the Consultant Project Manager (PM) and the design lead. Meetings will have an approximate duration of two (2) hours each. Meetings will be virtual using MicroSoft Teams.

- Consultant's internal project team will hold weekly internal project meetings to coordinate and maintain progress on the project during design. Meetings will include up to 5 Consultant staff for a duration of approximately one hour. There will be approximately 12 internal design coordination meetings.

Task 1 Deliverables

- Project Management Plan
- Consultant shall deliver to the City a monthly invoice and status report covering:
 - Work on the project performed during the previous month.
 - Meetings attended.
 - Issues encountered, and actions taken for their resolution.
 - Potential impacts to submittal dates, budget shortfalls or optional services.
 - Budget Analysis.
 - Issues requiring project team action.
- Invoices shall show employees hourly wage multiplied by 3.15 to get hourly billing rate, capped at \$300/hr.
- Project Design Schedule and updated project schedules, updated monthly during design and at major deliverables, in MicroSoft Project.
- Meeting agendas and summaries

Task 2 - Data Review and Site Reconnaissance

Gather and review existing mapping, as-builts, design drawings, engineering reports, easements and other data related to the proposed project. Perform site reconnaissance with City staff and design team to confirm existing site conditions and that existing survey base mapping is accurately represented and private utilities are as listed on the locate ticket. Review existing system operations with City staff.

Task 2 Assumptions

- It is assumed that City staff will provide available data and attend site visits.

Task 2 Deliverables

- There are no specific deliverables associated with this task as the data will be used to complete subsequent tasks.

Task 3 – 30% Preliminary Engineering

Conduct preliminary engineering and prepare a 30% Design Technical Memorandum that will constitute a 30% Design Submittal. Preliminary engineering work will include transmission main preliminary design, hydraulic analysis and transient analysis, water quality assessment, WTF preliminary design, treatment facility geotechnical investigation, and the 30% Design Technical Memorandum. Preliminary engineering will include adequate work to confirm project concepts and design criteria, and develop characterization and sizing of the treatment facilities to support the land use approval process. Anticipated subtasks are described as follows:

Subtask 3.1 - Transmission Main Preliminary Design

Preliminary Design for the transmission main alignment will include:

1. Pipe alignment evaluation along SE Bluff Road to identify the preferred location for the new pipeline within existing ROW, including coordination with the County. Develop a preferred preliminary alignment based on topographic survey and utility research for the pipeline on SE Bluff Road.
2. Coordinate layout of fiber optic conduit and pull boxes.
3. Review Geotechnical Engineering Report provided by City to determine if subsurface conditions require special construction or long-term seismic mitigation considerations.
4. Review resistivity testing results from geotechnical investigation to determine the corrosivity of soils in the vicinity of transmission pipeline and evaluate the need for cathodic protection of the pipeline.
5. Perform an evaluation of the Bear Creek culvert crossing. Review alternatives for shallow open cut trenching pipe installation versus deep auger bored trenchless crossing and identified preferred alternative.
6. Determine road pavement restoration requirements. Pavement restoration design will be in accordance with County standards.
7. Identify permitting requirements.

Subtask 3.1 Assumptions

- Baseline Work will include approximately 5,500 LF of 16-inch diameter DI transmission pipeline on SE Bluff Road from SE Proctor Road to SE Hudson Road.
- Further pipe sizing evaluation is not required.
- Basic design assumptions for the transmission main are provided above in Project Design Assumptions.

Subtask 3.1 Deliverables

- Section in 30% Design Technical Memorandum (Subtask 3.6) documenting pipeline design criteria and recommendations.
- Preliminary Drawings (PDF format): Prepare 30-percent design plans to consist of up to fifteen (15) plan and profile and other drawings with existing utility information, proposed pipeline alignment, and locations of key appurtenances.

Subtask 3.2 - Hydraulic Analysis and Transient Analysis

Hydraulic analysis will include:

1. Review and confirm design criteria provided in the Stantec Conceptual Design Report. Perform hydraulic analysis to identify hydraulic grade line and anticipated pump curves and system curves for the transmission system from the new pumpstation at the PWB Filtration Plant site to the

Revenue Avenue Reservoir, including available pressure for SAWC for domestic and fireflow conditions.

2. Additional analysis to review operating the pump station to provide water to PHWD. As such, the pumps will be dual purpose and pump through a single discharge main. The pumps will be upsized accordingly to meet PHWD flow demands.
3. Pumps will be identified based on the required flow and head conditions and available pump manufacturer data. Equipment will be identified and evaluated based on the required operating points and operational efficiencies of the equipment. Consultant staff will meet with City staff to identify equipment preferences based on functionality, operations and maintenance tasks and operator familiarity with equipment.
4. SAWC currently relies on the City's reservoir for daily domestic flow and fire flow, and there are flow reversals in the transmission main when PWB switches to groundwater and SAWC is served with Alder Creek supply. In the future, if the PWB supply is primarily used seasonally for supplementing summer demands, a pumping arrangement would be needed to ensure 24-hour delivery of water to SAWC. Operational strategies will be reviewed as part of this subtask.
5. Perform transient analysis and identify recommendations for control of adverse pressure surges from the BRSPS in the new and existing transmission main.
 - a. Perform pressure surge analysis simulations for the BRSPS when conveying water to the Revenue Avenue Reservoir. Simulations will include:
 - i. Pump power failure at the BRSPS,
 - ii. Pump start-up at the BRSPS, and
 - iii. Controlled pump shutdown at the BRSPS.

Test the sensitivity of the surge simulations to the potential effects of high and low Bull Run Filtration Facility clearwell water levels, high and low Revenue Avenue Reservoir water levels, the flow at the SAWC takeoff, and the flow at the PHWD takeoff.

- b. Evaluate the results of the simulations and determine whether surge control measures are necessary to protect the system, including the WTF, from adverse surge pressures created by the BRSPS.
- c. If surge protection is deemed necessary, Consultant will determine surge control measures (e.g., controlled venting vacuum relief valves for the proposed new transmission main, additional controlled venting vacuum relief valves for the existing transmission main, surge/pressure relief valves, pressurized surge tank(s), flywheels (if practicable), surge anticipating valves, slow closing check valves, pump station bypasses) for the new and existing transmission mains, 24-inch diameter suction header, and BRSPS.
- d. The pressure surge analyses simulations described above will be repeated with the recommended surge control measures in place to demonstrate the effectiveness of the surge protection improvements.

- e. Recommendations will be provided for safely starting and stopping the pumps at the BRSPS.
- f. Summarize the physical facilities, findings of the pressure surge simulations, hydraulic model results (i.e., plots of maximum and minimum HGL envelopes and pressure head traces), recommendations for safely starting and stopping the pumps at the BRSPS, and surge control recommendations for the system in a technical memorandum. Draft and final electronic technical memoranda will be provided.

Subtask 3.2 Assumptions

- Hydraulic analysis and transient analysis will be completed using the preferred transmission main alignment identified in Subtask 3.1.
- Hydraulic analysis and transient analysis will include proposed and existing facilities from the BRSPS to the City's Revenue Avenue Reservoir site, and will include study of surge on the GAC and Zealite filters.
- It is assumed that pump type will be can-mounted vertical turbine pumps, and further pump type evaluation is not required.

Subtask 3.2 Deliverables

- Preliminary hydraulic grade line, anticipated pump curves and system curves for the transmission system.
- Transient analysis technical memorandum (PDF format, in Appendix to 30% Preliminary Design Technical Memorandum).
- Section in 30% Design Technical Memorandum (Subtask 3.6) describing hydraulic analysis and transient analysis findings and recommendations.

Subtask 3.3 - Water Quality Assessment

The Consultant will perform a water quality assessment of the proposed transmission system improvements to review City and SAWC water quality related to integrating the future PWB supply, including:

- Potential water quality impacts to the City and SAWC related to the future transition from the current PWB unfiltered and chlorinated water supply to the proposed PWB filtered, chloraminated and pH adjusted water supply, acknowledging the change in water chemistry from the existing and future PWB supplies.
- Potential water quality impacts to the City and SAWC related to the City's proposed operational change from the current continuous year-round use of the PWB supply to primarily a seasonal summer peak season use of the new PWB supply. This includes potential for disinfection residual degradation in the transmission main during the off-peak season when minimal flow will be supplied through the transmission main, and issues from seasonal changes to City water system blending.
- Comparison of potential water quality impacts related to locating the City's proposed WTF at the PWB Filtration Plant site compared to locating it at the City reservoir site.

- Potential water quality impacts related to integrating the future PWB supply into the SAWC system through their connection to the existing transmission main on SE Bluff Road at SE Hauglum Road, including normal operations, reversal of flow within the transmission system, and potential backfeed of water from the Revenue Avenue Reservoir during an emergency event in the SAWC distribution system (a line break or fire, for example), that may involve mixing or exposure to water with free chlorine and chloramine disinfection.

Work under this subtask will include:

1. Prepare a desk-top risk matrix for the confirmed water quality and operating conditions based upon the different issues within the transmission system. Currently, possible issues that impact the risk matrix are expected to include the following:
 - a. Achieve ammonia removal at Bull Run WTF.
 - b. Achieve ammonia removal at Revenue Reservoir
 - c. Remove ammonia by breakpoint chlorination.
 - d. Remove ammonia by GAC/Zeolite treatment.
 - e. Potential for blending other water sources or alternating sources in the transmission and distribution systems (pH/alkalinity issues, disinfectant residual type and magnitude, LCR and DBP compliance, and aesthetics issues)
 - f. Impacts on water quality from the transmission pipeline.
 - g. Achieving overall compliance at each receiving location (City of Sandy and SAWC).
2. Perform Bench-scale testing and analysis to fill data gaps including:
 - a. Conduct chlorine breakpoint curves on both waters (e.g., the GAC/Zeolite treatment process may have a small amount of residual ammonia requiring breakpoint) with a brief testing plan (approximately 2 pages) outlining testing and sampling to be conducted.
 - b. Conduct chlorine decay curves up to 30 days starting at a 1 mg/L residual level. Water will have chlorine boosted during the tests if residual chlorine levels drop to ≤ 0.2 mg/L.
 - c. Evaluate impacts of pH/alkalinity adjustment on DBP formation.
 - d. Measure initial/starting DBPs and DBP levels after 30 days, and DBP levels at intermittent sampling points as informed by the client.
3. Develop an action plan for mitigating risks that have been identified during the project. These may include risks to aesthetic water quality (such as taste, odor, discoloration), and/or impacts to regulatory compliance (DBPs, Lead and Copper Rule, Revised Total Coliform Rule, etc.). The action plan will identify key activities, sequencing, and responsible parties.
4. Culminate all the above water quality risk identification and mitigation recommendations into a technical memorandum summarizing assessment approach, key findings, and recommendations for future system operations and improvements to serving Sandy and SAWC.

Subtask 3.3 Assumptions

- SAWC and Sandy provide responses to water quality, operations, and compliance data requests.
- It is assumed that once the new transmission system is operational, SAWC will switch from disinfection with free chlorine to PWB Filtration Plant chloraminated water if the City's WTF is located at the reservoir site.
- Consultant will coordinate with SAWC under Task 4 to review existing and future system operations and incorporate SAWC input into the water quality assessment.
- Sandy and SAWC attend a web-based risk matrix discussion meeting and provide comments on the draft risk matrix.
- The shipping, delivery, and analytical costs of all laboratory samples for the bench-scale DBP testing will be paid by the City.
- Sandy and SAWC attend a web-based meeting discussing action plan recommendations and provide comments on the draft action plan.

Subtask 3.3 Deliverables

- Draft and Final Water Quality Action Plan Technical Memorandum. (PDF format, in Appendix to 30% Preliminary Design Technical Memorandum).
- Section in 30% Design Technical Memorandum (Subtask 3.6) water quality assessment findings and recommendations.

Subtask 3.4 – Treatment Facility Preliminary Design

Since the City is not yet committed to dechloramination, the Consultant will perform an evaluation of capital, operations and lifecycle costs of chloramine removal compared to installing ammonia facilities at Alder Creek and Brownell Springs, and document findings in a technical memorandum. Cost comparison of chloramine removal versus ammonia addition, and Preliminary Design for the WTF located at the City's Revenue Avenue Reservoir will include:

1. Prepare Technical memorandum comparing budget-level capital, operations and lifecycle costs of installing dechloramination compared to installing ammonia facilities at Alder Creek and Brownell Springs. Work will include concept level capital, operating, and lifecycle costs for use in evaluating project alternatives. Costs will be budget-level, based on programmatic costs for similar facilities, scaled to this project using anticipated flows for each facility. Lifecycle cost will be developed using a present value Excel spreadsheet, projecting operating, maintenance, and replacement costs over a 30 year period for the purposes of comparing the lifecycle costs of the alternatives.
2. Confirm the feasibility of locating the proposed WTF at the City reservoir site versus at the PWB Filtration Plant site. Perform evaluation of treatment facility configuration and site layout at the Revenue Avenue Reservoir site. Develop preliminary design criteria and complete a siting analysis to confirm an economical orientation and configuration for the proposed GAC tanks and disinfection building, related facilities, and facility layout at the existing site. Document a preferred treatment facility configuration and site layout.

- a. Preliminary engineering activities include analysis to confirm feasibility of using the City reservoir site for the WTF, GAC tank sizing needs, transmission main sizing needs, chlorine system requirements, and sizing of other on-site improvements.
 - b. Review operational challenges related to locating the proposed WTF at the City reservoir site versus at the PWB Filtration Plant site and identify strategies to mitigate operational and water quality impacts.
 - c. Preliminary GAC tank layout plan, disinfection building mechanical floor plan and building elevation will be developed.
 - d. Provide conceptual site plans and renderings which will orient treatment facility configuration on the site with the surrounding landscaping and access to accommodate finished grade conditions.
 - e. Site plan and general facility configurations will be prepared, identifying key project features including chloramine removal (outdoor GAC tanks), disinfection building structure; valve vaults, if needed; access road; maintenance vehicle parking; and landscaping and screening.
 - f. Consultant will review development code requirements and incorporate requirements into the site improvements. Requirements may include setbacks, buffering and screening, lot coverage, access, landscaping, height limitations, and other typical requirements.
 - g. Stormwater analysis and report – Consultant will review City and DEQ requirements for addressing stormwater runoff from the new improvements at the reservoir site. The scope of work assumes stormwater may be discharged into the existing stormwater system and no expansion of the existing system will be required.
 - h. Consultant will consult with OHA regarding eliminating the disinfectant residual of finished water and then injecting a new disinfectant residual downstream without providing chlorine contact time. Preliminary design will include a discussion of OHA requirements for this project.
3. Structural designs and analysis: Perform preliminary structural assessment for GAC tank slab and disinfection building.
 4. Electrical and controls:
 - a. Technical memo describing the electrical and control system modifications required at the site to support the new chloramine removal building and equipment.
 - b. Preliminary electrical site plan and single line diagram.

Subtask 3.4 Assumptions

- Up to nine iterations of the net present value will be prepared to compare the lifecycle costs of removing ammonia from the PWB supply at the Revenue reservoir site and adding ammonia at the Brownell Springs and Alder Creek sites.
- Work will include chloramine removal and disinfection facilities located at the City's Revenue Avenue Reservoir site.

- Basic design assumptions for the treatment facility are provided above in Project Design Assumptions.
- The City will provide topographic surveying to supplement existing base mapping from the original reservoir construction project. It is anticipated that survey will be limited to the western half of the site to document existing ground conditions, utilities, trees, and other site features relevant to the design of the proposed treatment facilities.
- If required by City land use permitting process, the City will provide services of a professional arborist to provide an Arborist Report and consultation regarding existing tree impacts.

Subtask 3.4 Deliverables

- Technical memorandum documenting Lifecycle cost comparison of dechloramination compared to installing ammonia facilities (PDF format).
- Section in 30% Design Technical Memorandum (Subtask 3.6) documenting chloramine removal (outdoor GAC tanks) and disinfection building design criteria and recommendations.
- Preliminary Structural Design reporting, covering structural design criteria and recommendations for Chloramine removal (outdoor GAC tanks) and disinfection building (PDF format, in Appendix to Preliminary Design Report).
- Preliminary electrical and I&C reporting, covering electrical and control system modifications required at the site to support the new chloramine removal building and equipment.
- Stormwater report and engineering calculations for land use permitting, development review, and preliminary design reporting (PDF format).
- Preliminary Drawings (PDF format):

Subtask 3.5 – Treatment Facilities Geotechnical Investigation

It is known that the existing reservoir and pump station construction included ground improvement using rammed aggregate piers to mitigate the potential liquefaction induced seismic settlement due to existing subsurface soil conditions. Therefore, a geotechnical investigation of the WTF location at the reservoir site is proposed and will include:

1. Review available geotechnical and geological information (existing geotechnical report for previous development, DOGAMI hazard mapping and nearby groundwater information).
2. Conduct one (1) geotechnical boring to 50 feet deep. The boring will provide soil resistance and samples for seismic hazards evaluation/mitigation and foundation design recommendation development.
3. Conduct cyclic direct simple shear test (Cyclic DSS) and other laboratory testing to assess the soil liquefaction potential at the site.
4. Assess soil seismic profile (site classification) and site response parameters in accordance with the 2022 Oregon Structure Specialty Code (OSSC).

5. Evaluate the liquefaction potential, and liquefaction induced effects such as seismic-induced settlements, lateral spreading, and potential reduction in soil bearing capacity.
6. Evaluate static and seismic soil bearing capacity, subgrade modulus, and total and differential settlements for the proposed foundation.
7. Provide recommendations and design criteria for the preferred foundation (i.e. shallow or deep foundation) or ground improvement to mitigation soil liquefaction hazard.
8. Provide lateral load resistance recommendations, including passive earth pressure and coefficient of friction.
9. Provide recommendations for site preparation, grading, drainage, and wet-weather earthwork procedures.
10. Provide engineered fill recommendations for the foundation or ground improvement and compaction criteria.
11. Develop a geotechnical engineering report to present our subsurface condition interpretation, seismic hazards and mitigation evaluations, geotechnical engineering analysis, and recommendations for foundation or ground improvement design/construction.
12. Input and review to the seismic hazard mitigation and earthwork related design and specifications.
13. Prepare geotechnical engineering report. (PDF format, in Appendix to 30% Preliminary Design Technical Memorandum).

Subtask 3.5 Assumptions

- City to locate buried utilities onsite that are unknown to the One-Call utility locating service.
- The explorations do not include environmental assessments, and the site is assumed to be “clean” regarding contaminated and hazardous materials.

Subtask 3.5 Deliverables

- Draft and Final Geotechnical Engineering Report. (PDF format, in Appendix to 30% Preliminary Design Technical Memorandum).
- Section in 30% Design Technical Memorandum (Subtask 3.6) geotechnical investigation findings and recommendations.

Subtask 3.6 - 30% Design Technical Memorandum

Work under this subtask includes preparing a preliminary design technical memorandum that describes and illustrates key design criteria, schematic level designs and general facility configurations to the 30% completion level. Preliminary transmission pipeline plan and profiles drawings will be used to establish a preferred pipeline alignment. A plan and cross-sectional analysis of the treatment facilities layout will be used to establish the optimal orientation of the key project features.

Work also includes preparing a Class 4 Engineer's Opinion of Probable Construction Costs (OPCC), based on prior experience on similar projects and current data relative to construction pricing trends. The itemized construction cost estimate will be for a 30% design completion level. A cost-loaded schedule will be prepared using the OPCC data, and a permitting plan will be developed.

Subtask 3.6 Assumptions

- It is assumed that 30% design drawings will contain up to thirty (30) including a vicinity map, transmission pipeline plan and profile sheets, treatment facility site layout, treatment facility floor plans and architectural sections, grading plan, and site piping plan.
- 30% OPCC to be completed in accordance with the Association for the Advancement of Cost Engineering International (AACE) Class 4 standards, with an expected accuracy range of +50 to -30 percent, as recommended for a preliminary design level of project definition.

Task 3.6 Deliverables

- Draft and Final 30% preliminary design package to include the following element (PDF format):
 - 30% Design Technical Memorandum, (Final version will incorporate City comments)
 - 30% design drawings
 - Hydraulic Grade Line
 - Pump Station Pump and System Curves
 - Equipment Selection / Equipment List
 - Preliminary P&ID
 - Class 4 OPCC
 - Cost-Loaded Schedule
 - Permitting Plan
 - Transient Analysis Report
 - Water Quality Assessment Report
 - Treatment Facilities Geotechnical Engineering Report

Subtask 3.7 - Early Procurement Evaluation

Early procurement evaluation will include:

1. Evaluate equipment and materials included in the 30% Design for each facility and estimate potential delivery times based on discussions with suppliers and specific experience from other recent projects.
2. Develop a draft project schedule that includes anticipated long-lead time materials and equipment to determine if early procurement of certain items would help improve the completion date for the Project.
3. Prepare Procurement Technical Memorandum documenting work and providing recommendations.

Subtask 3.7 Deliverables

- Early Procurement Technical Memorandum

Task 4 – Jurisdictional Agency and Utility Coordination

Coordinate with all jurisdictional agencies and utilities involved in the design, construction, and permitting for the Project. Perform subsurface utility explorations to estimate horizontal and vertical information for existing utilities.

Subtask 4.1 – Jurisdictional Agency Coordination

Coordinate with jurisdictional agencies.

Subtask 4.1 Assumptions

AGENCY	ASSUMPTIONS
➤ Clackamas County Transportation & Development	Up to five meetings with two Consultants for one hour each
➤ City of Sandy Planning Department	Up to four meetings with two Consultants for one hour each
➤ City of Sandy Building Department	Up to two meetings with three Consultants for up to one hour each
➤ Portland Water Bureau	Up to five Design Review Meetings with three Consultants for two hours each
➤ Oregon Trail School District	Up to two meetings with two Consultants for one hour each
➤ Pleasant Home Water District	Up to three meetings with two Consultants for two hours each
➤ Skyview Acres Water Company	Up four meetings with three Consultants for two hours each
➤ Oregon Health Authority	Up to three meetings with two Consultants for one hour each
➤ Oregon DEQ	Up to two meetings with two Consultants for one hour each
➤ Assume meetings will be virtual meetings, except four in-person meetings that include travel time for up to three Consultant team members.	

Subtask 4.1 Deliverables

- Communication documents such as copies of email, telephone memos, and/or formal correspondence of significance to the project.

Subtask 4.2 – Utility Coordination

Work under this task includes utility coordination to support preliminary and final design project work. Communicate and coordinate with utility providers within the project limits to review potential conflicts with proposed work. Utility coordination work is to include the following.

1. Develop a utility contact information list and prepare project information letters to all utility companies involved to explain proposed project work. Project information letters will be emailed to utility contacts and include 30% plans in PDF format.
2. Identify potential utility conflicts and develop a list of potholing needs. Coordinate with City staff for potholing needs.
3. Maintain a record of correspondence with utility companies.

Subtask 4.2 Assumptions

- Coordination is anticipated with the following utilities:
 - Northwest Natural
 - Portland General Electric
 - Various Telecommunications Providers
- Transmission main alignment will be selected to avoid relocations of existing utilities. However, should relocations be necessary, additional utility coordination assistance may be provided by amendment to coordinate relocations and resolve conflicts with affected utilities.

Subtask 4.2 Deliverables

- Utility contact information list and project information letters

Subtask 4.3 - Subsurface Utility Explorations

Subsurface utility explorations will be performed by our subconsultant VacX to support final design project work. Vacuum excavation will be used to estimate horizontal and vertical information for existing utilities at critical transmission main crossing and connection locations along SE Bluff Road from SE Proctor Road to SE Hudson Road.. Information gathered on all utilities encountered during the excavation (including top, bottom, width, general soil conditions, and asphalt/concrete thickness, etc.) will be provided in an excel format along with accompanying sketches that locate each pothole relative to existing surface features and include details of the findings. Potholing will include backfilling all test holes with a material approved by the jurisdiction involved (Clackamas County). At each pothole location, a core of the existing pavement will be removed prior to potholing. Potholes will be patched with hot mix asphalt concrete, or other approved material, and finished neatly.

Subtask 4.3 Assumptions

- VacX budget estimate includes up to 10 potholes to be performed during daytime hours.
- It is anticipated that utilities will be eight (8) feet or less in depth.
- Up to 80 inches of coring and hot mix asphalt restoration (8 inches per pothole location).
- A Street Opening Permit will be required for potholing within Clackamas County ROW.

- No hazardous materials will be encountered.
- Includes time for Consor staff to visit the site and mark limits for utility locates and pothole locations.

Subtask 4.3 Deliverables

- Up to 10 pothole data reports and sketches

Task 5 – Final Design (60%, 90%, 100%)

Work under this task includes preparation of final construction drawings, technical specifications, and contract documents for bidding and construction of the proposed improvements. Consultant will submit plans and specifications for City review at the 60% and 90% completion levels, incorporating City review comments from each prior submittal.

Construction drawings and special technical specifications will be in accordance with City standards, policies, and procedures. Plan and profile drawings will be provided at a horizontal scale of 1-inch = 20 feet. Technical specifications will be developed using the Construction Specifications Institute (CSI) 48-division specification format. Contract documents will be developed based on the City's bidding requirements and the Engineers Joint Contract Documents Committee (EJCDC) format and Consultant's standard template. An Engineer's OPCC will be developed and included at each design submittal stage.

Subtask 5.1 - 60% Design (Plans, Specifications, Bid Schedule, Estimate)

Based on the City's input on preliminary designs, Consultant will develop 60% designs that depict recommended waterline improvements. Designs at this stage will establish appropriate project limits, identify connection locations to the existing water system, and include draft profiles. Specific work under this task include:

1. Prepare 60% construction drawings including draft profiles and draft details.
2. Prepare 60% technical specifications and bid schedule to cover conditions specific to the work.
3. Prepare 60% OPCC (Class 3).

Subtask 5.1 Assumptions

- Project schedule assumes up to two (2) weeks of City time for review and comments following design submittal.
- 60% OPCC will be completed in accordance with the AACE Class 3 standards, with an expected accuracy range of +30 to -20 percent, as recommended for a preliminary design level of project definition.

Subtask 5.1 Deliverables

- 60% design package to include water main plan and profile drawings, draft technical specifications, bid schedule, and cost estimate.
- Drawings: 11-inch by 17-inch plans in electronic PDF file
- Contract Documents/Specifications: electronic Word and PDF file formats

- 60% OPCC (Class 3): Electronic PDF file format

Subtask 5.2 - 90% Design (Plans, Specifications, Contract Documents, Estimate)

Under this task, the 60% designs will be advanced to 90% completion, incorporating City review comments. Specific work under this task include:

1. Prepare 90% construction plan/profile drawings and details to clearly describe the work to be constructed.
2. Prepare draft front-end contract documents.
3. Prepare updated 90% technical specifications.
4. Prepare 90% OPCC (Class 2).

Subtask 5.2 Assumptions

- Project schedule assumes up to two (2) weeks of City time for review and comments following design submittal.
- 90% OPCC will be completed in accordance with the AACE Class 2 standards, with an expected accuracy range of +20 to -15 percent, as recommended for a preliminary design level of project definition.

Subtask 5.2 Deliverables

- 90% design package to include plans, draft technical specifications, draft contract documents, and cost estimate.
- Drawings: 11-inch by 17-inch plans in electronic PDF file
- Contract Documents/Specifications: electronic Word and PDF file formats
- 90% OPCC (Class 2): Electronic PDF file format

Subtask 5.3 - 100% Design (Final Plans, Specifications, Contract Documents, Estimate)

The final 100% design submittal will be advanced from the 90% submittal, incorporating City's review comments. Work under this subtask includes preparing final contract documents, technical specifications and drawings required for bidding the project. Prepare 100% OPCC (Class 2).

Subtask 5.3 Assumptions

- Consultant will prepare final contract documents for printing production.
- Project schedule includes one (1) week for City review if requested.
- 100% OPCC will be completed in accordance with the AACE Class 2 standards, with an expected accuracy range of +10 to -10 percent, as recommended for a final design level of project definition.

Subtask 5.3 Deliverables

- 100% design package to include final plans, technical specifications, contract documents, and OPCC.
- 100% Signed Drawings and Contract Documents (Permit/Final Review Set): Three (3) hard copy sets of 11-inch by 17-inch plans and three (3) hard copies of contract documents/specifications; on set of documents in electronic Word and PDF file formats.
- Final Signed Drawings: Five (5) hardcopy sets of 22-inch by 34-inch plans and electronic AutoCAD and PDF file formats.
- 100% OPCC (Class 2): Electronic PDF file format.

Task 6 – Permits and Approvals (Transmission Main and WTF)

Consultant will prepare applications for obtaining permits and approvals for the transmission main and WTF project construction. Work under this task includes coordination with agency jurisdictions to review requirements, completing permit applications), and providing design documentation. Anticipated permits and approvals include the following:

1. City of Sandy Land Use Review Approval
 - a. Consultant will schedule and attend a pre-application meeting with City of Sandy to confirm requirements for preparing the Land Use Application. Consultant will develop exhibits for the pre-application meeting.
 - b. Consultant will review prior Land Use Approvals and supporting documentation for the Reservoir Site, to determine if existing understand prior conditions that may apply to a land use application.
 - c. Consultant will prepare the application narrative based on the pre-application meeting and City of Sandy Development Code.
 - d. Consultant will prepare the following exhibits in support of the Land Use application. Plan exhibits will be based on surveyed base maps prepared in Task 3.6.
 - i. Architectural drawings
 1. Floor plan
 2. Roof plan
 3. Elevations (four sides)
 4. Perspective drawing
 - ii. Site Development drawings
 1. Site Analysis
 2. Site Plan
 3. Exterior lighting
 4. Grading and Erosion Control Plan
 5. Utility plan
 6. Stormwater plan
 7. Existing conditions and demo plan
 8. Landscaping plan

9. Stormwater Report
10. TIA Memo

2. Clackamas County Utility Permit. Consultant will prepare the following exhibits and the permit application for pipeline work proposed in County ROW.
 - a. Erosion control plan
 - b. Plan/profile
 - c. Traffic Control Plan
 - d. Application and pre-application
3. Oregon DEQ National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit #1200-C
4. State of Oregon, Oregon Health Authority, Drinking Water Program Plan Review
5. Determine if JPA is required for Bear Creek Culvert Crossing – its assumed not needed.

Subtask 6 Assumptions

- For fee estimating purposes it is assumed that permitting processes are completed within reasonable time frames, and that the City will pay all required permit fees.
- This scope of work assumes one set of revisions may be needed during Land Use Completeness Review that will take up to 24 hours to prepare.
- This scope assumes the application will not be appealed. If the application is appealed, addition scope will be required.
- It is assumed that the construction contractor will be responsible for obtaining all other building, trade and construction permits.

Subtask 6 Deliverables

- Design plans, building elevations, reports, specifications and calculations to support the City Land Use Review application and review process.
- A complete permit application package for review and approval for:
 - Clackamas County Utility Permit
 - Oregon DEQ National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit #1200-C
 - State of Oregon, Oregon Health Authority, Drinking Water Program Plan Review

Task 7 – Bid Phase Services

Consultant shall provide bid phase support to the City as follows.

Subtask 7.1 Bid & Award Support

1. Coordinate and lead the pre-bid meeting, including preparing agenda and minutes. Up to three Consultant staff will be in attendance.
2. Respond to bidder questions
3. Prepare Addenda
4. Attend opening of bids
5. Review bids and prepare Bid Tabulation
6. Prepare Recommendation of Award

Subtask 7.2 Prepare Conformed Drawings

1. Consultant shall update individual plan sheets and specifications for a conformed set of documents that incorporate addendum changes.

Task 7 Assumptions

- It is assumed that the transmission main and treatment facility will be bid as a single contract. If it is determined later that they will be bid as separate bid packages, additional bid phase services will be added by amendment.
- City will lead the bidding process, including advertisement, plan holders list, posting/distributing bid documents.
- Consultant will conduct Bid Opening, with up to three (3) Consultant staff attending.
- City will lead the administration of contract award, including Intent to Award and Notice of Award.
- Four (4) Addenda are budgeted to address and incorporate permitting review comments
- City will post/distribute addenda.
- Full set of drawings and specifications will be reissued as Conformed Set and provided to the City and construction contractor.

Task 7 Deliverables

- Pre-bid meeting agenda and meeting notes in electronic Word and PDF file formats
- Addenda in electronic Word and PDF file formats
- Drawings for Addenda in electronic PDF file format
- Bid Tabulation in .xls and PDF file format.
- Recommendation of Award in PDF format
- Conformed Drawing Set in electronic PDF file format
- Conformed Specification Set in electronic PDF file format

Task 8 – Construction Phase – deferred

Bid Package No. 2 – BRSPS Work:

Task 9 – Additional Project Management

Objective

Provide additional project management for pumpstation and additional transmission pipeline work, which will be prepared as a separate construction bid set.

Subtask 9.1 – Additional Project Management & Administration

- Similar services to Subtask 1.2

Subtask 9.2 – Additional Invoices/Status Reporting

- Similar services to Subtask 1.2

Subtask 9.3 – Additional Project Design Meetings

1. Work under this subtask includes coordinating schedules, developing agendas, and preparing presentation materials for key project meetings during the project design phase, and includes the following meetings:
 - Preliminary Design (30% Design) Review Meeting
 - 60% Design Review Meeting
 - 90% Design Review Meeting
 - Project update at City Council meeting, if requested
2. Agency coordination meetings will be conducted concurrently with the Transmission Pipeline Work and are included in Task 4.1.
3. Agendas and supporting information to be distributed through the City's project manager in advance of any meeting.
4. Meeting notes to be distributed to meeting attendees and other interested parties within five (5) business days of the subject meeting date.

Subtask 9.4 – Additional Quality Assurance/Quality Control

1. Consultant will perform in-house QA/QC reviews of all deliverables prior to submitting to the City.

Task 9 Assumptions

- Total project duration for the Pump Station work will be approximately 32 months from NTP in November 2023 through construction completion in June 2026; therefore, it is assumed that there will be up to 32 progress payments/status reports.
- Design Review Meetings will include the Consultant Project Manager (PM) and the design lead. Meetings will have an approximate duration of two (2) hours each. Meetings will be virtual using MicroSoft Teams.
- Consultant's internal project team will hold weekly internal project meetings to coordinate and maintain progress on the project during design. Meetings will include up to 3 Consultant staff for

a duration of approximately one hour. There will be approximately 12 internal design coordination meetings.

Task 9 Deliverables

- Similar to Task 1.1 Deliverables

Task 10 – Additional Data Review and Site Reconnaissance

Gather and review existing mapping, as-builts, design drawings, engineering reports, easements and other data related to the proposed project. Perform site reconnaissance with City staff, Portland staff, and design team to confirm existing site conditions and that existing survey base mapping is accurately represented and private utilities are as listed on the locate ticket. Review existing system operations with City staff.

Task 10 Assumptions

- It is assumed that City staff will provide available data and attend site visits.

Task 10 Deliverables

- There are no specific deliverables associated with this task as the data will be used to complete subsequent tasks.

Task 11 – Additional 30% Preliminary Engineering

Conduct additional preliminary engineering and prepare additional sections and information in the 30% Design Technical Memorandum that will constitute a 30% Design Submittal. Additional preliminary engineering work will include BRSPS preliminary design and additions to the 30% Design Technical Memorandum. Additional preliminary engineering will include adequate work to confirm project concepts and design criteria and develop characterization and sizing of the BRSPS to support the land use approval process. Anticipated subtasks are described as follows:

Subtask 11.1 – Pump Station Preliminary Design

Preliminary Design for the BRSPS located at the PWB Filtration Plant site will include:

1. Coordination with City staff on key design elements, design criteria, and development of preliminary plans to the approximately 30% design completion level as described below.
2. Preliminary pump station layout – Develop preliminary floor plan and elevation alternatives will be developed. Consultant staff will meet with City staff to review and select a preferred pump station layout.
3. Provide conceptual site plans and renderings which will orient pump station configuration on the site with the surrounding landscaping and access to accommodate finished grade conditions.
4. Site plan and general facility configurations will be prepared, identifying key project features including building structure; valve vaults, if needed; access road; maintenance vehicle parking; and landscaping and screening.
5. Stormwater analysis and report – Consultant will review PWB, Multnomah County and DEQ requirements for addressing stormwater runoff from the new improvements at the BRPS site. The

scope of work assumes stormwater may be discharged into the existing stormwater system and no expansion of the existing system will be required.

6. Identify permitting requirements. Consultant will review development code requirements and incorporate requirements into the site improvements. Requirements may include setbacks, buffering and screening, lot coverage, access, landscaping, height limitations, and other typical requirements.
7. Structural designs and analysis: Perform preliminary structural assessment for pump station.
8. Electrical and controls:
 - a. Technical memo describing the electrical and control system modifications required at the site to support the new pump station and equipment.
 - b. Preliminary electrical site plan and single line diagram.
 - c. Evaluate equipment load and approximate required power supply size to provide power to the new pump station and site. Begin coordination with PGE.

Subtask 11.2 Assumptions

- Bid Package No. 2 Work will include 5 MGD BRSPS located at the PWB Filtration Plant site.
- Basic design assumptions for the pump station are provided above in Project Design Assumptions.
- It is assumed that pump type will be can-mounted vertical turbine pumps, and further pump type evaluation is not required.
- The City will provide topographic surveying to supplement existing base mapping from the PWB Filtration Plant project. Subtask 11.2 Deliverables
- Section in 30% Design Technical Memorandum (Subtask 3.6) documenting pump station design criteria and recommendations.
- Preliminary Structural Design reporting, covering structural design criteria and recommendations for pump station building (PDF format, in Appendix to Preliminary Design Report).
- Preliminary electrical and I&C reporting, covering electrical and control system modifications required at the site to support the new pump station and equipment. (PDF format, in Appendix to Preliminary Design Report).
- Preliminary Drawings (PDF format): Prepare Preliminary Design plans to consist of up to twenty (20) plan sheets for the pump station, site plan, yard piping, and other features.

Subtask 11.3 – Additional Early Procurement Evaluation

Additional early procurement evaluation will include:

1. Evaluate equipment and materials included in the 30% Design for each facility and estimate potential delivery times based on discussions with suppliers and specific experience from other recent projects.

2. Develop a draft project schedule that include anticipated long-lead time materials and equipment to determine if early procurement of certain items would help improve the completion date for the project.
3. Prepare Procurement Technical Memorandum documenting work and providing recommendations.

Subtask 11.3 Deliverables

- Early Procurement Technical Memorandum

Task 12 – Additional Final Design (60%, 90%, 100%)

Work under this task includes preparation of additional final construction drawings, technical specifications, and contract documents for bidding and construction of the proposed improvements. Consultant will submit plans and specifications for City review at the 60% and 90% completion levels, incorporating City review comments from each prior submittal.

Construction drawings and special technical specifications will be in accordance with City standards, policies, and procedures. Plan and profile drawings will be provided at a horizontal scale of 1-inch = 20 feet. Technical specifications will be developed using the Construction Specifications Institute (CSI) 48-division specification format. Contract documents will be developed based on the City's bidding requirements and the Engineers Joint Contract Documents Committee (EJCDC) format and Consultant's standard template. An Engineer's OPCC will be developed and included at each design submittal stage.

Subtask 12.1 - 60% Design (Plans, Specifications, Bid Schedule, Estimate)

Based on the City's input on preliminary designs, Consultant will develop 60% designs that depict recommended waterline improvements. Designs at this stage will establish appropriate project limits, identify connection locations to the existing water system, and include draft profiles. Specific work under this task include:

1. Prepare 60% construction drawings including draft profiles and draft details. Drawings will include draft plan and section views for the control valve vault, and draft electrical plans.
2. Prepare 60% technical specifications and bid schedule to cover conditions specific to the work.
3. Prepare 60% OPCC (Class 3).

Subtask 12.1 Assumptions

- Project schedule assumes up to two (2) weeks of City time for review and comments following design submittal.
- 60% OPCC will be completed in accordance with the AACE Class 3 standards, with an expected accuracy range of +30 to -20 percent, as recommended for a preliminary design level of project definition.

Subtask 12.1 Deliverables

- 60% design package to include water main plan and profile drawings, draft technical specifications, bid schedule, and cost estimate.

- Drawings: 11-inch by 17-inch plans in electronic PDF file
- Contract Documents/Specifications: electronic Word and PDF file formats
- 60% OPCC (Class 3): Electronic PDF file format

Subtask 12.2 - 90% Design (Plans, Specifications, Contract Documents, Estimate)

Under this task, the 60% designs will be advanced to 90% completion, incorporating City review comments. Specific work under this task include:

1. Prepare 90% construction plan/profile drawings and details to clearly describe the work to be constructed.
2. Prepare draft front-end contract documents.
3. Prepare updated 90% technical specifications.
4. Prepare 90% OPCC (Class 2).

Subtask 12.2 Assumptions

- Project schedule assumes up to two (2) weeks of City time for review and comments following design submittal.
- 90% OPCC will be completed in accordance with the AACE Class 2 standards, with an expected accuracy range of +20 to -15 percent, as recommended for a preliminary design level of project definition.

Subtask 12.2 Deliverables

- 90% design package to include plans, draft technical specifications, draft contract documents, and cost estimate.
- Drawings: 11-inch by 17-inch plans in electronic PDF file
- Contract Documents/Specifications: electronic Word and PDF file formats
- 90% OPCC (Class 2): Electronic PDF file format

Subtask 12.3 - 100% Design (Final Plans, Specifications, Contract Documents, Estimate)

The final 100% design submittal will be advanced from the 90% submittal, incorporating City's review comments. Work under this subtask includes preparing final contract documents, technical specifications and drawings required for bidding the project. Prepare 100% OPCC (Class 2).

Subtask 12.3 Assumptions

- Consultant will prepare final contract documents for printing production.
- Project schedule includes one (1) week for City review if requested.

- 100% OPCC will be completed in accordance with the AACE Class 2 standards, with an expected accuracy range of +10 to -10 percent, as recommended for a final design level of project definition.

Subtask 12.3 Deliverables

- 100% design package to include final plans, technical specifications, contract documents, and OPCC.
- 100% Signed Drawings and Contract Documents (Permit/Final Review Set): Three (3) hard copy sets of 11-inch by 17-inch plans and three (3) hard copies of contract documents/specifications; 1 set of files in electronic Word and PDF file formats.
- Final Signed Drawings: Five (5) hardcopy sets of 22-inch by 34-inch plans and electronic AutoCAD and PDF file formats.
- 100% OPCC (Class 2): Electronic PDF file format.

Task 13 – Additional Permits and Approvals

Consultant will assist with obtaining permits and approvals for the transmission main and treatment facility project construction. Work under this task includes coordination with agency jurisdictions to review requirements, completing permit applications, and providing design documentation. Anticipated permits and approvals include the following:

1. Multnomah County Land Use Review Approval (by others). The Consultant will provide the following exhibits in support of Sandy's application to Multnomah County for the pump station and pipeline located in Multnomah County. Exhibits will be based on base maps provided by City's Program Manager Stantec.
 - a. Preliminary Site Plan (Conсор)
 - b. Utility Plan (Conсор)
 - c. Grading plan (Conсор)
 - d. Circulation and access (Conсор)
 - e. Landscape plan (Conсор)
 - f. Stormwater Management Plan (Conсор)
 - g. Site Lighting Plan (Conсор)
 - h. Floor plan and roof plan (Conсор)
 - i. Building elevations and perspective (Conсор)
 - j. Utility plan (Conсор)
 - k. Pipeline plan (Conсор)
2. Oregon DEQ National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit #1200-C
3. State of Oregon, Oregon Health Authority, Drinking Water Program Plan Review

Subtask 13 Assumptions

- For fee estimating purposes it is assumed that permitting processes are completed within standard anticipated time frames, and that the City will pay all required permit fees.

- It is assumed that the City will prepare application, apply for, and obtain Land Use Review Approval for the pump station located on the PWB Filtration Plant site and the transmission main extending from the pump station to SE Bluff Road and provide the following exhibits:
 - Vicinity map and zoning (Stantec)
 - Existing conditions (Stantec)
 - Pipeline overall site plan (Stantec)
- It is assumed that the construction contractor will be responsible for obtaining all other building, trade and construction permits.

Subtask 13 Deliverables

- Design plans, building elevations, reports, specifications and calculations to support the City Land Use Review application and review process.
- A complete permit application package for review and approval for:
 - Clackamas County Utility Permit
 - Oregon DEQ National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit #1200-C
 - State of Oregon, Oregon Health Authority, Drinking Water Program Plan Review

Task 14 – Additional Bid Phase Services

Consultant shall provide bid phase support to the City as follows.

Subtask 14.1 Bid & Award Support

1. Attend the pre-bid meeting (Pump Station Lead)
2. Respond to bidder questions
3. Prepare Addenda
4. Attend opening of bids
5. Review bids and prepare Bid Tabulation
6. Recommendation of Award?

Subtask 14.2 Prepare Conformed Drawings

1. Consultant shall update individual plan sheets if needed for a conformed set of documents that incorporate addendum changes.

Task 14 Assumptions

- Pump station will be bid as a separate contract. PWB will handle bidding of the pipeline on the PWB property and Carpenter Lane segments.
- City will lead the bidding process, including advertisement, planholders list, posting/distributing bid documents.
- Consultant will conduct Bid Opening, with up to three (3) Consultant staff attending.

- Four (4) Addenda are budgeted to address and incorporate permitting review comments
- City will post/distribute addenda.
- Full set of drawings and specifications will be reissued as Conformed Set and provided to the City and construction contractor.

Task 14 Deliverables

- Pre-bid meeting agenda and meeting notes in electronic Word and PDF file formats
- Addenda in electronic Word and PDF file formats
- Drawings for Addenda in electronic PDF file format
- Bid Tabulation in .xls and PDF file format.
- Recommendation of Award in PDF format
- Conformed Drawing Set in electronic PDF file format
- Conformed Specification Set in electronic PDF file format

Task 15 – Management Reserve for Optional Ammonia Facilities Design

Subtask 15.1 Optional Ammonia Facilities Design

Work under this Optional Task includes preliminary design, design, permitting and bidding phase services for the alternative approach involving ammonia addition at the City’s other water sources, Alder Creek and Brownell Springs, to convert the City’s existing disinfection systems from free chlorine to chloramines. Fees for this task are in addition to fees estimated for the WTF related design, permitting and bidding phase services.

Task 15 Assumptions

- The scope for Ammonia Facilities Design will be updated when the scope of the improvements are determined. The Management Reserve amount is intended to allow work to move forward within the Management Reserve Budget once the scope of the project is identified. A detailed scope of work will be included in an amendment once the scope is determined. The amendment may include additional budget if the scope of work exceeds the Management Reserve fund in this task.

Task 15 Deliverables

- Task 15 Deliverables for Ammonia Facilities will be determined within the allocated Management Reserve Budget

Proposed Subconsultants

- Peterson Structural Engineering, Inc. (PSE) - Structural Engineering;
- Strongwork Architecture, LLC (Strongwork) – Architectural;
- Industrial Systems, Inc (ISI) – Electrical and I&C Engineering;
- R&W Engineering, Inc. (R&W) – HVAC Mechanical Engineering
- Northwest Hydraulic Consultants (NHC) – Transient Analysis;
- Confluence Engineering Group, LLC (Confluence) - Water Quality;
- Delve Underground (Delve) - Geotechnical & Foundation Engineering;
- VacX – Utility Potholing;
- David Evans and Associates, Inc. (DEA) – Environmental Permitting, if required

Budget

Consultant proposes to perform this work on a time and expenses basis with a total not to exceed amount of \$2,725,857, which includes design, permitting, and bid phase services for Bid Package No. 1 and No. 2. Optional work for design, permitting and bidding phase services for the alternative approach involving ammonia addition at the City's other water sources, Alder Creek and Brownell Springs sites will be performed on a time and expenses basis with an additional total not to exceed amount of \$935,064, in addition to fees estimated for the WTF related design, permitting and bidding phase services. The total for all work including optional work is \$3,660,921. Construction phase services are not included herein and will be negotiated at a later date. The proposed fee estimate is provided as "Attachment A", and is based on rates calculated using a 3.15 multiplier on direct labor rates of Consultant's staff direct labor rate.

Project Schedule

Consultant anticipates Notice to Proceed by December 5, 2023. Project schedule will be distributed at the Project Kick-off Meeting.

Preliminary Drawing List

Bid Package No. 1 - Transmission Pipeline and WTF Work:

General

- G-1 Cover and Index Sheet
- G-2 Location and Vicinity Maps
- G-3 Symbols and Legend
- G-4 Abbreviations
- G-5 General Notes

Erosion and Sedimentation Control

- ESC-1 Erosion and Sedimentation Control Cover Sheet and Notes
- ESC-2 Erosion and Sedimentation Control Plan - Transmission Main (Typ)
- ESC-3 Erosion and Sedimentation Control Plan - WTF Site
- ESC-4 Erosion and Sedimentation Control Plan - Details

Traffic Control

- TC-1 Traffic Control Plan – General Notes and Sign Details
- TC-2 Traffic Control Plan - Typical Detour Map
- TC-3 Traffic Control Plan – Typical Road and Lane Closures
- TC-4 Traffic Control Plan Intersection Plan and Details

SCHEDULE A – TRANSMISSION MAIN

- TM-C-1 Transmission Main Plan & Profile STA 1+00 to STA 6+60
- TM-C-2 Transmission Main Plan & Profile STA 6+60 to STA 12+20
- TM-C-3 Transmission Main Plan & Profile STA 12+20 to STA 17+80
- TM-C-4 Transmission Main Plan & Profile STA 17+80 to STA 23+40
- TM-C-5 Transmission Main Plan & Profile STA 23+40 to STA 29+00
- TM-C-6 Transmission Main Plan & Profile STA 29+00 to STA 34+60
- TM-C-7 Transmission Main Plan & Profile STA 34+60 to STA 40+20
- TM-C-8 Transmission Main Plan & Profile STA 40+20 to STA 45+80

TM-C-9	Transmission Main Plan & Profile STA 45+80 to STA 51+40
TM-C-10	Transmission Main Plan & Profile STA 51+40 to STA 55+00
TM-C-11	Transmission Main Civil Details - 1
TM-C-12	Transmission Main Civil Details - 2
TM-C-13	Transmission Main Civil Details - 3
TM-C-14	Transmission Main Civil Details - Cathodic Protection
TM-C-15	Transmission Main Civil Details - Typical Roadway Resurfacing Sections

SCHEDULE B – WATER TREATMENT FACILITY

Civil

WTF-C-1	Existing Conditions Plan
WTF-C-2	Site Layout Plan
WTF-C-3	Tree Protection and Removal Plan
WTF-C-4	Grading Plan
WTF-C-5	Access Road Profiles and Details
WTF-C-6	On-Site Water Piping Plan
WTF-C-7	On-Site Water Piping Profiles
WTF-C-9	On-Site Drainage and Sanitary Sewer Piping Plan
WTF-C-10	On-Site Drainage and Sanitary Sewer Piping Profiles
WTF-C-11	Off-Site Drainage and Sanitary Sewer Piping Plan and Profiles
WTF-C-12	Miscellaneous Civil Details - 1
WTF-C-13	Miscellaneous Civil Details - 2
WTF-C-12	Miscellaneous Civil Details - 3
WTF-C-13	Miscellaneous Civil Details – 4

Landscaping

WTF-L-1	Treatment Facility Planting Plan
WTF-L-2	Planting Plan Details - 1
WTF-L-3	Planting Plan Details - 2
WTF-L-4	Treatment Facility Site - Irrigation Plan
WTF-L-5	Irrigation Details

Architectural

WTF-A-1	Architectural Legend and Code Information
WTF-A-2	Architectural Floor Plan
WTF-A-3	Architectural RCP, Roof Plan, and Millwork
WTF-A-4	Architectural Exterior Elevations and Building Sections
WTF-A-5	Architectural Sections
WTF-A-6	Architectural Schedules
WTF-A-7	Architectural Assemblies and Details
WTF-A-8	Architectural Details and Sections
WTF-A-9	Architectural Standard Details - 1
WTF-A-10	Architectural Standard Details - 2
WTF-A-11	Architectural Standard Details - 3
WTF-A-12	Site Egress Plan

Structural

WTF-S-1	General Structural Notes
WTF-S-2	Structural Quality Control Plan and Notes - 1
WTF-S-3	Structural Quality Control Plan and Notes - 2
WTF-S-4	GAC Tanks Floor Plan
WTF-S-5	GAC Tanks Elevations and Sections
WTF-S-6	Building Floor and Foundation Plan, Roof Framing Plan
WTF-S-7	Building Structural Sections
WTF-S-8	CMU Wall Typical Details
WTF-S-9	CMU Wall Connection Details
WTF-S-10	Structural Details - 1
WTF-S-11	Structural Details - 2

Mechanical

WTF-M-1	GAC Tanks Mechanical Floor Plan
WTF-M-2	GAC Tanks Mechanical Piping Plan
WTF-M-3	GAC Tanks Mechanical Sections
WTF-M-4	Building Mechanical Floor Plan
WTF-M-5	Building Mechanical Piping Sections
WTF-M-6	Building Mechanical Sections
WTF-M-7	Mechanical Details - 1
WTF-M-8	Mechanical Details - 2
WTF-M-9	Mechanical Details – 3
WTF-M-10	Water Quality Panel and Chemical Injection Piping
WTF-M-11	Plumbing Plan and Schedule
WTF-M-12	HVAC Floor Plan
WTF-M-13	Meter and Chemical Injection Vault Plan & Section
WTF-M-14	Miscellaneous Mechanical Details - 1
WTF-M-15	Miscellaneous Mechanical Details – 2

Electrical

WTF-E-1	Electrical Symbols and Legend and Abbreviations
WTF-E-2	Electrical One Line Diagram
WTF-E-3	Electrical Site Plan
WTF-E-4	Electrical Site Plan - conduit along piping for fiber
WTF-E-5	Electrical Site Plan - conduit along piping for fiber
WTF-E-6	Building Power and Instrumentation Plan
WTF-E-7	Building Lighting and Grounding
WTF-E-8	Electrical Panel Schedule & Circuit Schedule
WTF-E-9	Electrical Details

Instrumentation and Controls

WTF-I-1	P&ID
WTF-I-2	Control Panel Arrangement
WTF-I-3	Control Panel Power & Fusing
WTF-I-4	Terminal Arrangements
WTF-I-5	Interconnection Details
WTF-I-6	I/O Sheet 1

Bid Package No. 2 – BRSPS Work:

General

G-1	Cover and Index Sheet
G-2	Location and Vicinity Maps
G-3	Symbols and Legend
G-4	Abbreviations
G-5	General Notes

Erosion and Sedimentation Control

ESC-1	Erosion and Sedimentation Control Cover Sheet and Notes
ESC-2	Erosion and Sedimentation Control Plan - BRSPS Site
ESC-3	Erosion and Sedimentation Control Plan – Details

PS-C-1	Existing Conditions Plan
PS-C-2	Site Layout Plan
PS-C-3	Grading Plan
PS-C-4	Access Road Profiles and Details
PS-C-5	On-Site Water Piping Plan
PS-C-6	On-Site Water Piping Profiles
PS-C-7	On-Site Drainage and Sanitary Sewer Piping Plan
PS-C-8	On-Site Drainage and Sanitary Sewer Piping Profiles
PS-C-9	Storm Water Facility Plan, Section and Details
PS-C-10	Miscellaneous Civil Details - 1
PS-C-11	Miscellaneous Civil Details - 2
PS-C-12	Miscellaneous Civil Details - 3
PS-C-13	Miscellaneous Civil Details - 4

Landscaping

PS-L-1	BRSPS Planting Plan
PS-L-2	Off-site Restoration Plan
PS-L-3	Planting Plan Details - 1
PS-L-4	Planting Plan Details - 2
PS-L-5	BRSPS - Irrigation Plan
PS-L-6	Irrigation Details

Architectural

PS-A-1	Architectural Legend and Code Information
PS-A-2	Pump Station Architectural Floor Plan
PS-A-3	Pump Station Architectural RCP and Roof Plan
PS-A-4	Pump Station Architectural Exterior Elevations and Building Sections
PS-A-5	Pump Station Architectural Sections
PS-A-6	Pump Station Architectural Details and Sections
PS-A-7	Architectural Standard Details - 1
PS-A-8	Site Egress Plan

Structural

PS-S-1	General Structural Notes
PS-S-2	Structural Quality Control Plan and Notes - 1
PS-S-3	Structural Quality Control Plan and Notes - 2
PS-S-4	Pump Station Floor and Foundation Plan, Roof Framing Plan
PS-S-5	Pump Station Structural Sections
PS-S-6	CMU Wall Typical Details
PS-S-7	CMU Wall Connection Details
PS-S-8	Structural Details - 1

Mechanical

PS-M-1	Pump Station Mechanical Floor Plan
PS-M-2	Pump Station Mechanical Piping Sections
PS-M-3	Pump Station Mechanical Sections
PS-M-4	Mechanical Details - 1
PS-M-5	Mechanical Details - 2
PS-M-6	Plumbing Plan and Schedule
PS-M-7	HVAC Floor Plan
PS-M-8	Miscellaneous Mechanical Details - 1
PS-M-9	Miscellaneous Mechanical Details – 2

Electrical

PS-E-1	Electrical Symbols and Legend and Abbreviations
PS-E-2	Electrical One Line Diagram
PS-E-3	Electrical Site Plan
PS-E-4	Pump Station Building Power and Instrumentation Plan
PS-E-5	Pump Station Building Lighting and Grounding
PS-E-6	Pump Station Electrical Panel Schedule & Circuit Schedule
PS-E-7	Electrical Details - 1
PS-E-8	Electrical Details – 2
PS-E-9	Motor Control Diagrams

Instrumentation and Controls

PS-I-1	SCADA Communication Network Diagram
PS-I-2	P&ID - 1
PS-I-3	P&ID - 2
PS-I-4	Control Panel Arrangement
PS-I-5	Control Panel Power & Fusing
PS-I-6	Terminal Arrangements
PS-I-7	Interconnection Details
PS-I-8	I/O - 1
PS-I-9	I/O - 2