

EXHIBIT A

RFQ NO. TVWD-082014

SCOPE OF SERVICES

This section contains a brief outline of the required project scope of services associated with the Willamette River Water Treatment Plant (WRWTP) 2015 Master Plan Update. It is not intended to be a complete list of all work activities required to complete the work but is intended to highlight some of the key elements of work that will need to be included in the consultant's complete scope of services. The Scope of tasks differ for the Upper WRWTP site and the Lower WRWTP site as outlined below.

Project Tasks

Task 1 – Project Management

- 1.1. Provide project management services for master planning and subsequent tasks.
- 1.2. Provide monthly billing invoices. Monthly invoices shall include a detailed breakdown of staff member hours billed by task and subtask. Include a summary of expenditures to date, percentage complete by task and subtask, budget amount remaining, and earned value per task and subtask. Include a cost loaded project schedule, anticipated spending curve with graphical spending to date, cost performance index and schedule performance index.
- 1.3. Provide project summary reports on a monthly basis. Monthly project reports should include an overview of the past month's activities, identification of upcoming project activities and milestones, outstanding issues, a financial summary table, updated schedule and the spending curve from Task 1.2.
- 1.4. Coordinate with the Tualatin Valley Water District (TVWD) project manager on a regular basis to discuss the status and progress of various work activities and overall completion of various work elements. Provide weekly status meetings by phone and one in person meeting every third meeting.
- 1.5. Provide agenda and minutes for all meetings held.
- 1.6. Manage the project to ensure efficient and coordinated completion of various design tasks and getting District input where needed to facilitate moving the project along in a timely manner. Develop a schedule that incorporates all key design and permit related activities and submittals. Provide updates to project schedule as needed, and monthly at a minimum. Cost load schedule and include plot of anticipated and actual expenditures with monthly reports per Task 1.3.

- 1.7. Implement quality assurance and quality control measures for all aspects of the work.
- 1.8. Document decisions as they occur during the progression of the work. Maintain a decision log throughout the project.
- 1.9. Maintain a risk register and identify potential project risks with coordination with the District and the WTP Partners.
- 1.10. Implement additional project controls as required for complete management of the work.
- 1.11. Provide updated project schedule in Gantt format to the District's project manager on a monthly basis, or more frequently if the project schedule is substantially delayed or shifted.
- 1.12. Coordinate, track, and implement District design review comments.
- 1.13. Facilitate monthly coordination meetings with representatives of the WRWTP Master Plan Participants. Topics shall include current and upcoming issues, project progress, overview of change management and general project coordination.
- 1.14. Identify project stakeholders, solicit input, track and address project stakeholder issues and concerns.
- 1.15. Direct and coordinate the work of all subconsultants.

Task 2 – Evaluate and Inventory Existing Facilities and Compile Existing Studies

- 2.1. Provide overview of all current facilities and treatment processes utilized at the treatment plant. Outline facility inventory including raw water intake structures, site piping, treatment plant, finished water storage, and finished water transmission components. Specifically highlight facilities, structures, or appurtenances that have been added since the completion of the 2006 Master Plan.
- 2.2. Prepare a scaled map of the Lower site existing facilities, including but not limited to raw water intake structures, site piping, treatment plant buildings and structures, water storage, and transmission and pump facilities. Also include important site features such as vehicular and pedestrian facilities, park facilities adjacent to the existing treatment plant, and approximate property lines. Include environmental features including any streams, wetlands and buffers. Delineate environmental areas using appropriate field identification methods by qualified personnel. Specifically highlight facilities or structures on the map that have been added since the completion of the 2006 Master Plan.
- 2.3. Prepare a scaled map of the Upper site, including but not limited to site topography, property boundaries and easements, environmental features including any streams, wetlands and buffers. Delineate environmental areas using appropriate field identification methods by qualified personnel. Extents of the map shall extend to provide a continuous topographic and feature map with that prepared under Task 2.2.
- 2.4. Provide overview of operational performance measures, which shall include but is not limited to raw water flow rates, daily production rates, electrical usage, chemical usage, sludge production, sand loss, settled water, filtered water and finished water turbidity, ozone disinfection performance, filter production efficiency, and clearwell disinfection. Provide tabular comparison to data presented in Table 3.1 of the 2006 Master Plan.
- 2.5. Provide capacity analysis of existing facilities including the current capacity of each individual component within the treatment process train. For each major plant component, evaluate both the maximum process capacity as measured by hydraulic flow and the size or rate controlling design criteria. Provide tabular comparison to data presented in Tables 3-2a and 3-2b of the 2006 Master Plan. Include a summary analysis of the unit process capacities to assist in determining the next logical expansion capacity of the Lower site.
- 2.6. Compile and provide a summary of existing studies, annual reports and other documents related to WTP performance, raw water quality, and any documents relative to the WTP Master Planning.

Task 3 – Historical Water Quality and Regulatory Compliance

- 3.1. Document local, regional and national standards and evaluate regulatory compliance alternatives for using ozone as a primary disinfectant. Coordinate with regulators and determine feasibility, potential acceptability and rule making process for using ozone as a primary disinfectant.
- 3.2. Evaluate chlorine CT compliance point alternatives. Coordinate with regulators and make recommendations on potential compliance points. This task applies to the Upper site only.
- 3.3. Identify and tabulate existing water quality production goals, from the existing Lower Site WTP operations contract and compare to existing and potential future regulatory limits. Compile historic performance, including probability distributions of raw & finished water turbidity, TOC, and finished water chlorine residual. Compile and tabulate available finished water DBP data.

Task 4 – Treatment Technology Review

- 4.1. Research, review and summarize innovations to existing treatment technologies. Research, review and summarize emerging treatment technologies. Provide a presentation to staff which overviews innovations and emerging technologies researched and reviewed under this subtask.
- 4.2. Identify current and future technologies and summarize applicability of technologies to current treatment, potential contaminants of emerging concern (CECs), pharmaceutical and personal care products (PPCPs) and algal toxins. Provide a technical memorandum summarizing anticipated effectiveness of each technology on CECs, PPCPs and algal toxins. This subtask applies to the Upper site only.
- 4.3. Evaluate UV and H₂O₂, AOP and other potential treatment approaches that could be utilized at the Upper site. Evaluate anticipated effectiveness and summarize local availability of treatment chemicals and materials for each process. Recommend a long-term disinfection strategy. Strategy should address potential regulatory changes which will require treatment of emerging contaminants in the future.

Task 5 – Raw Water Sampling

- 5.1. Compile historical raw water sampling data. Update Comparison of Regulatory and Contract Sampling Frequencies Table 4-1 and Summary of Raw Water Quality Table 4-2, from the 2006 Master Plan.
- 5.2. Evaluate applicability of existing raw water sampling program to the Upper site treatment train. Develop recommendations for sampling program at the Upper site.

- 5.3. Research and identify likely CECs, PPCPs and assess the potential for algal toxins within the watershed that could impact raw water quality. Provide recommendations on future monitoring. Develop the CEC and PPCP list based on existing publications and previous work. Sampling and a Source Water Assessment are not part of this task.

Contingency: Provide additional raw water sampling to support Tasks 5.1 – 5.3.

Task 6 – Develop WTP Expansion Scenarios and Phasing to Meet Demands

- 6.1. Compile and verify projected WTP demands for both the Upper and Lower sites. Base demands on previous work completed as part of the Willamette Water Supply Program Preliminary Design project, verify with each WRWTP Master Plan Participant and supplement with additional data as needed. Provide graphical summary of WRWTP Master Plan Participant demands over the planning horizon.
- 6.2. Summarize existing WTP finish water quality goals. Review with WRWTP Master Plan Participants and determine applicability to the Upper site treatment processes. Modify and/or develop recommended finish water quality goals for the Upper site through workshop and input from the Upper site users.
- 6.3. Develop recommended treatment trains for the Upper site based on finish water quality goals, demands and operational approaches. Identify treatment train alternatives, construction and O&M costs for each alternative. Develop evaluation criteria in collaboration with the Upper site users for use in determining recommended treatment train and approach.
- 6.4. Evaluate anticipated effectiveness of the Upper site treatment train alternatives on CEC, PPCP and algal toxin removal by unit process. Provide a graphical and/or tabular summary of effectiveness by unit process and treatment train options.
- 6.5. Develop Upper site operational and treatment approaches. The operational and treatment approaches developed under this task shall consider the Upper site as a stand-alone WTP which utilizes the Raw Water Intake and Pump Station in parallel with Lower site operations. Identify site layouts and required facilities for the operation of the stand-alone Upper site WTP. Identify unit cost of water production for the Upper site under this scenario.
- 6.6. Develop Upper site operational and treatment approaches considering an integrated operational scenario with the Lower site. Identify recommended common facilities between the two sites, integrated operational scenarios, inter-ties and capital and O&M costs. Identify unit cost of water production for the integrated operational approach for both the Upper and Lower sites.
- 6.7. Develop recommendations for Upper and Lower site expansion and phasing for both stand-alone and integrated operational scenarios. For the Upper site

include capacity increments and timing based on projected Upper site user demands and evaluate potential public benefit opportunities and integration with the existing WTPs public amenities. Develop site layouts in accordance with regulatory and land use requirements. For the Lower site determine expansion recommendations based on compatibility with existing unit processes and capacity increments to be added to individual unit processes to achieve the next logical expansion of the overall Lower site capacity. Identify how long the recommended Lower site capacity expansion will meet Lower site demands based on projected demands from Task 6.1. Develop site layouts for both sites for both stand-alone and integrated operations.

- 6.8. Recommend Upper and Lower site operational approaches considering stand alone and integrated approaches. Include, staffing, chemical requirements, and comparison of O&M and unit costs of production for each scenario. Base operational recommendations on expansion increments developed in Task 6.7.
- 6.9. Evaluate capacity of existing Finish Water Pump station and identify any upgrades needed for the next logical expansion of the Lower site and initial and future capacities of the Upper site.
- 6.10. Develop staffing plan scenarios for recommended operational approaches. Include staffing by expansion phase of the Upper site considering both stand alone and integrated operational scenarios.
- 6.11. Determine Operations and Maintenance (O&M) costs by unit process for recommended treatment train on the Upper site and the unit process expansion of the Lower site. Correlate O&M costs for the Upper site with demand projections and expansion phasing. Develop O&M costs for both stand-alone and integrated operational scenarios.
- 6.12. Facilitate multiple project stakeholder workshops to present and solicit feedback on preliminary site layouts and operational scenarios.

Task 7 – Permit and Regulatory Review

- 7.1. Identify permits required for construction, expansion and operations of the new Upper site WTP and permits required for the next logical expansion of the existing Lower Site WTP. Summarize application requirements, review timelines and potential conditions of approval. Identify potential issues that could delay the permitting process and project delivery schedule.
- 7.2. Develop a permit matrix summarizing applicable permits, information from Task 7.1, precedent permits and agency contacts.
- 7.3. Facilitate multiple project stakeholder meetings to review permit constraints, timelines and identify permit strategies for all expansion, construction and maintenance scenarios identified as part of the Master Plan.

Task 8 – Emergency Operations and Resiliency

- 8.1. Perform hazard analysis and identify potential emergency scenarios the Upper site WTP may be required to operate under. Include seismic, source contamination and other potential hazards.
- 8.2. Develop Level of Service (LOS) goals for each identified emergency scenario. Develop LOS goals for the Upper site in coordination with each of the WTP users.
- 8.3. Facilitate multiple WTP user workshops to identify LOS goals and potential operational scenarios.
- 8.4. Perform seismic evaluation of existing WTP facilities. Work under this task will be focused on the facilities identified as common to both the Upper and Lower site as part of an integrated operational scenario developed under Task 6. Determine impact of anticipated seismic performance on seismic LOS goals.
- 8.5. Identify mitigation measures required to meet LOS goals. Mitigation measures include retro-fits to the existing WTP facilities identified as common to both the Upper and Lower site as part of an integrated operational scenario developed under Task 6 as well as design upgrades to future facilities.
- 8.6. Develop cost impacts of meeting LOS goals for both the existing common facility retro-fits and the impact to design of new and expanded facilities.
- 8.7. Perform a probabilistic risk assessment to determine the benefit/cost ratio of meeting the LOS goals. Consider both direct and indirect losses associated with each hazard event.

Task 9 –Raw Water Intake and Pump Station Evaluation

- 9.1. Evaluate intake expansion phasing alternatives to meet demands of the Upper and Lower sites and verify permit requirements. Provide river hydrodynamic modeling and sweeping velocity analysis for each phase and verify compliance with applicable permits and regulations.
- 9.2. Evaluate raw water pump station expansion phasing alternatives to meet demands and for recommended operational scenarios. Provide computational fluid dynamics (CFD) modeling of the existing raw water pump station and to verify expansion alternatives. Evaluate modeling results and recommend any necessary upgrades needed to accommodate the Upper site development and phasing and the increased capacity of the Lower site expansion.
- 9.3. Facilitate multiple meetings with project stakeholders to identify issues, constraints, goals and objectives of Raw Water Intake and Pump Station expansion and operations.

Task 10 – Recommendation of Property and Easement Needs

- 10.1. Identify easements and/or additional property needed for Upper site construction and phasing. Identify required construction and staging needs as well as areas needed for Upper site phasing.
- 10.2. Evaluate opportunities and benefits of additional property as compared to additional costs required for expansion on the existing Upper site.

Task 11 – Evaluate Current Power Supply & Onsite Generation Needs

- 11.1. Evaluate adequacy and resiliency of existing power supply. Include historical interruptions and coordinate with existing power provider to determine potential future upgrades.
- 11.2. Determine on-site power generation requirements for both emergency LOS goals and average day demand scenarios for each recommended phase of the Upper site.
- 11.3. Verify capacity of existing on-site power generation for the Lower site. Compare actual capacity to design capacity and summarize impacts to existing treatment capacity. Identify recommended upgrades to meet Lower site demands. Identify recommended equipment for the Upper site to meet LOS goals developed under Task 8.

Task 12 – Cost Estimates and Schedule

- 12.1 Develop AACE Class 4 cost estimates for each recommended phase of Upper site expansion and Lower site capacity increase.
- 12.2 Develop phasing implementation schedule in Gantt chart form. Include permitting, design, bid, construction and start-up for each phase as applicable.

Task 13 – Clearwell and Off-site Storage Requirements

- 13.1 Determine maximum on-site storage available at the Upper site based on available land area and site layout of recommended treatment train.
- 13.2 Determine impact on treatment and operations of on-site storage as compared to off-site storage. Include recommendations on location of off-site storage and property impacts.

Task 14 – Capital & Maintenance Plan

- 14.1 Develop a Capital and Maintenance Plan for the Upper site and the expanded Lower site. Include each phase of the recommended Upper site expansion.