

**CITY OF PORTLAND
AGREEMENT FOR PROFESSIONAL, TECHNICAL, OR EXPERT SERVICES**

CONTRACT NUMBER 30005914

**TITLE OF WORK PROJECT
Supply System Master Plan**

This Contract is between the City of Portland ("City," or "Bureau") and **CH2M Hill, Engineers, Inc.**, hereafter called Consultant. The City's Project Manager for this Contract is **Jodie Inman**.

Effective Date and Duration

This Contract shall become effective on **September 1, 2017**. This Contract shall expire, unless otherwise terminated or extended, on **June 30, 2021**.

Consideration

- (a) City agrees to pay Consultant a sum not to exceed **\$795,358** for accomplishment of the work.
- (b) Interim payments shall be made to Consultant according to the schedule identified in the STATEMENT OF THE WORK AND PAYMENT SCHEDULE.

CONSULTANT DATA AND CERTIFICATION

Name (print full legal name): CH2M Hill Engineers, Inc.

Address: 2020 SW Fourth Avenue, Portland OR 97201

Employer Identification Number (EIN): 32-0100027

[INDEPENDENT CONSULTANTS: DO NOT PROVIDE SOCIAL SECURITY NUMBER (SSN) – LEAVE BLANK IF NO EIN]

City of Portland Business Tax Registration Number: 19347095

Citizenship: Nonresident alien ☐ Yes ☒ No
Business Designation (check one): ☐ Individual ☐ Sole Proprietorship ☐ Partnership ☒ Corporation
☐ Limited Liability Co (LLC) ☐ Estate/Trust ☐ Public Service Corp. ☐ Government/Nonprofit

Payment information shall be reported to the IRS under the name and taxpayer I.D. number provided above. Information must be provided prior to Contract approval.

TERMS AND CONDITIONS

1. Standard of Care

Consultant shall perform all services under this Contract using that care, skill, and diligence that would ordinarily be used by similar professionals in this community in similar circumstances.

2. Effect of Expiration

Passage of the Contract expiration date shall not extinguish, prejudice, or limit either party's right to enforce this Contract with respect to any default or defect in performance that has not been corrected.

3. Order of Precedence

This Contract consists of these Terms and Conditions, the Statement of Work and Payment Schedule, and any exhibits that are attached. Any apparent or alleged conflict between these items shall be resolved by using the following order of precedence:

a) these Terms and Conditions; b) Statement of Work and Payment Schedule; and c) any exhibits attached to the Contract.

4. Early Termination of Contract

- (a) The City may terminate this Contract for convenience at any time for any reason deemed appropriate in its sole discretion. Termination is effective immediately upon notice of termination given by the City.
- (b) Either party may terminate this Contract in the event of a material breach by the other party that is not cured. Before termination is permitted, the party seeking termination shall give the other party written notice of the breach, its intent to terminate, and fifteen (15) calendar days to cure the breach. If the breach is not cured within 15 calendar days, the party seeking termination may terminate immediately by giving written notice that the Contract is terminated.

5. Remedies and Payment on Early Termination

- (a) If the City terminates pursuant to 4(a) above, the City shall pay the Consultant for work performed in accordance with the Contract prior to the termination date. No other costs or loss of anticipated profits shall be paid.
- (b) If the City terminates pursuant to 4(b) above, the City is entitled all remedies available at law or equity. In addition, Consultant shall pay the City all damages, costs, and sums incurred by the City as a result of the breach.
- (c) If the Consultant justifiably terminates the Contract pursuant to subsection 4(b), the Consultant's only remedy is payment for work prior to the termination. No other costs or loss of anticipated profits shall be paid.
- (d) If the City's termination under Section 4(b) was wrongful, the termination shall be automatically converted to one for convenience and the Consultant shall be paid as if the Contract was terminated under Section 4(a).
- (e) In the event of early termination the Consultant's work product before the date of termination becomes property of the City.

6. Assignment

Consultant shall not subcontract, assign, or transfer any of the work scheduled under this agreement, without the prior written consent of the City. Notwithstanding City approval of a subconsultant, the Consultant shall remain obligated for full performance hereunder, and the City shall incur no obligation other than its obligations to the Consultant hereunder. The Consultant agrees that if subconsultants are employed in the performance of this Agreement, the Consultant and its subconsultants are subject to the requirements and sanctions of ORS Chapter 656, Workers' Compensation.

7. Compliance with Applicable Law

Consultant shall comply with all applicable federal, state, and local laws and regulations. Consultant agrees it currently is in compliance with all tax laws. Consultant shall comply with Title VI of the Civil Rights Act of 1964 and its corresponding regulations. In connection with its activities under this Contract, the Consultant shall comply with all applicable Grant Terms and conditions. This includes all terms and conditions contained in this Contract and, for a Contract involving a grant, the Grant Terms and Conditions.

8. Indemnification for Property Damage and Personal Injury

Consultant shall indemnify, defend, and hold harmless the City, its officers, agents, and employees, from all claims, losses, damages, and costs (including reasonable attorney fees) for personal injury and property damage arising out of the intentional misconduct or negligent acts or omissions of the Consultant, its Subconsultants, suppliers, employees or agents in the performance of its services. Nothing in this paragraph requires the Consultant or its insurer to indemnify the City for claims of personal injury or property damage caused by the negligence of the City. This duty shall survive the expiration or termination of this Contract.

9. Insurance

Consultant shall obtain and maintain in full force at Consultant expense, throughout the duration of the Contract and any warranty or extension periods, the required insurance identified below. The City reserves the right to require additional insurance coverage as required by statutory or legal changes to the maximum liability that may be imposed on Oregon cities during the term of the Contract.

- (a) Workers' compensation insurance as required by ORS Chapter 656 and as it may be amended. Unless exempt under ORS Chapter 656, the Consultant and all subconsultants shall maintain coverage for all subject workers.

☒ Required and attached // ☐ Proof of exemption (i.e., completion of Workers' Compensation Insurance Statement)

- (b) General commercial liability (CGL) insurance covering bodily injury, personal injury, property damage, including coverage for independent consultant's protection (required if any work shall be subcontracted), premises/operations, Contractual liability, products and completed operations, in per occurrence limit of not less than \$1,000,000, and aggregate limit of not less than \$2,000,000.

☒ Required and attached // ☐ Waived by Bureau Director or designee // ☐ Reduce by Bureau Director or designee

- (c) Automobile liability insurance with coverage of not less than \$1,000,000 each accident, and an umbrella or excess liability coverage of \$2,000,000. The insurance shall include coverage for any auto or all owned, scheduled, hired and non-owned auto. This coverage may be combined with the commercial general liability insurance policy.

☒ Required and attached // ☐ Waived by Bureau Director or designee // ☐ Reduce by Bureau Director or designee

- (d) Professional Liability and/or Errors & Omissions insurance to cover damages caused by negligent acts, errors or omissions related to the professional services, and performance of duties and responsibilities of the Consultant under this Contract in an amount with a combined single limit of not less than \$1,000,000 per occurrence and aggregate of \$3,000,000 for all claims per occurrence. In lieu of an occurrence based policy, Consultant may have claims-made policy in an amount not less than \$1,000,000 per claim and \$3,000,000 annual aggregate, if the Consultant obtains an extended reporting period or tail coverage for not less than three (3) years following the termination or expiration of the Contract.

☒ Required and attached // ☐ Waived by Bureau Director or designee // ☐ Reduce by Bureau Director or designee

Continuous Coverage; Notice of Cancellation: The Consultant agrees to maintain continuous, uninterrupted coverage for the duration of the Contract. There shall be no termination, cancellation, material change, potential exhaustion of aggregate limits or non-renewal of coverage without thirty (30) calendar days' written notice from Consultant to the City. If the insurance is canceled or terminated prior to completion of the Contract, Consultant shall immediately notify the City and provide a new policy with the same terms. Any failure to comply with this clause shall constitute a material breach of Contract and shall be grounds for immediate termination of this Contract.

Additional Insured: The liability insurance coverages, except Professional Liability, Errors and Omissions, or Workers' Compensation, shall be without prejudice to coverage otherwise existing, and shall name the City of Portland and its bureaus/divisions, officers, agents and employees as Additional Insureds, with respect to the Consultant's activities to be performed, or products or services to be provided. Coverage shall be primary and non-contributory with any other insurance and self-insurance. Notwithstanding the naming of additional insureds, the insurance shall protect each additional insured in the same manner as though a separate policy had been issued to each, but nothing herein shall operate to increase the insurer's liability as set forth elsewhere in the policy beyond the amount or amounts for which the insurer would have been liable if only one person or interest had been named as insured.

Certificate(s) of Insurance: Consultant shall provide proof of insurance through acceptable certificate(s) of insurance, including additional insured endorsement form(s) and all other relevant endorsements, to the City prior to the award of the Contract if required by the procurement documents (e.g., request for proposal), or at execution of Contract and prior to any commencement of work or delivery of goods or services under the Contract. The Certificate(s) shall specify all of the parties who are endorsed on the policy as Additional Insureds (or Loss Payees). Insurance coverages required under this Contract shall be obtained from insurance companies acceptable to the City of Portland. The Consultant shall pay for all deductibles and premium. The City reserves the right to require, at any time, complete, certified copies of required insurance policies, including endorsements evidencing the coverage the required.

Subconsultant(s): Consultant shall provide evidence that any subconsultant, if any, performing work or providing goods or service under the Contract has the same types and amounts of coverages as required herein or that the subconsultant is included under Consultant's policy.

10. Ownership of Work Product

All work product produced by the Consultant under this Contract is the exclusive property of the City. "Work Product" includes, but is not limited to: research, reports, computer programs, manuals, drawings, recordings, photographs, artwork and any data or information in any form. The Consultant and the City intend that such Work Product shall be deemed "work made for hire" of which the City shall be deemed the author. If for any reason a Work Product is deemed not to be a "work made for hire," the Consultant hereby irrevocably assigns and transfers to the City all right, title and interest in such work product, whether arising from copyright, patent, trademark, trade secret, or any other state or federal intellectual property law or doctrines. Consultant shall obtain such interests and execute all documents necessary to fully vest such rights in the City. Consultant waives all rights relating to work product, including any rights arising under 17 USC 106A, or any other rights of authorship, identification or approval, restriction or limitation on use or subsequent modifications. If the Consultant is an architect, the Work Product is the property of the Consultant-Architect, and by execution of this Contract, the Consultant-Architect grants the City an exclusive and irrevocable license to use that Work Product.

Notwithstanding the above, all pre-existing trademarks, services marks, patents, copyrights, trade secrets, and other proprietary rights of Consultant are and shall remain the exclusive property of Consultant.

11. EEO Certification

The Consultant must be certified prior to Contract execution, as Equal Employment Opportunity Affirmative Action Employers as prescribed by Chapter 5.33.076 of the Code of the City of Portland.

12. Equal Benefits

Consultant must certify prior to Contract execution, that they provide benefits to their employees with spouses as prescribed by Chapter 5.33.077 of the Code of the City of Portland.

13. Successors in Interest

The provisions of this Contract shall be binding upon and shall inure to the benefit of the parties hereto, and their respective successors and approved assigns.

14. Severability

The parties agree that if any term or provision of this Contract is declared by a court of competent jurisdiction to be illegal or in conflict with any law, the validity of the remaining terms and provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Contract did not contain the particular term or provision held to be invalid.

15. Waiver

The failure of the City to enforce any provision of this Contract shall not constitute a waiver by the City of that or any other provision.

16. Errors

The Consultant shall promptly perform such additional services as may be necessary to correct errors in the services required by this Contract without undue delays and without additional cost.

17. Governing Law/Venue

The provisions of this Contract shall be interpreted, construed and enforced in accordance with, and governed by, the laws of the State of Oregon without reference to its conflict of laws provisions that might otherwise require the application of the law of any other jurisdiction. Any action or suits involving any question arising under this Contract must be brought in the appropriate court in Multnomah County Oregon.

18. Amendments

All changes to this Contract, including changes to the scope of work and Contract amount, must be made by written amendment and approved by the Chief Procurement Officer to be valid. Any amendment that increases the original Contract amount by more than 25% must be approved by the City Council to be valid.

19. Business Tax Registration

The Consultant shall obtain a City of Portland business tax registration number as required by PCC 7.02 prior to beginning work under this Contract.

20. Prohibited Conduct

The Consultant shall not hire any City employee who evaluated the proposals or authorized the award of this Contract for two years after the date the Contract was authorized without the express written permission of the City and provided the hiring is permitted by state law.

21. Payment to Vendors and Subconsultants

The Consultant shall timely pay all subconsultants and suppliers providing services or goods for this Contract.

22. Access to Records

The Consultant shall maintain all records relating to this Contract for three (3) years after final payment. The City may examine, audit and copy the Consultant's books, documents, papers, and records relating to this Contract at any time during this period upon reasonable notice. Copies of these records shall be made available upon request. Payment for the reasonable cost of requested copies shall be made by the City.

23. Audits

- (a) The City may conduct financial and performance audits of the billings and services specified in this Contract at any time in the course of the Contract and during the three (3) year period established by paragraph 22. Audits shall be conducted in accordance with generally accepted auditing standards as promulgated in Government Auditing Standards by the Comptroller General of the United States Government Accountability Office.
- (b) If an audit discloses that payments to the Consultant exceed the amount to which the Consultant was entitled, the Consultant shall repay the amount of the excess to the City.

24. Electronic Signatures

The City and Consultant may conduct this transaction, including any Contract amendments, by electronic means, including the use of electronic signatures.

25. Merger Clause

This Contract encompasses the entire agreement of the parties, and supersedes all previous understandings and agreements between the parties, whether verbal or written.

26. Dispute Resolution/Work Regardless of Disputes

The parties shall participate in mediation to resolve disputes before conducting litigation. The mediation shall occur at a reasonable time after the conclusion of the Contract with a mediator jointly selected by the parties. Notwithstanding any dispute under this Contract, the Consultant shall continue to perform its work pending resolution of a dispute, and the City shall make payments as required by the Contract for undisputed portions of the work. In the event of litigation, no attorney fees are recoverable. No different dispute resolution paragraph(s) in this Contract or any attachment hereto shall supersede or take precedence over this provision.

27. Progress Reports: ☒ Applicable ☐ Not Applicable

If applicable, the Consultant shall provide monthly progress reports to the Project Manager as described in the Statement of the Work and Payment Schedule.

28. Consultant's Personnel: ☒ Applicable ☐ Not Applicable

If applicable, the Consultant shall assign the personnel listed in the Statement of the Work and Payment Schedule for the work required by the Contract and shall not change personnel without the prior written consent of the City, which shall not be unreasonably withheld.

29. Subconsultants

The Consultant shall use the subconsultants identified in its proposals. The Consultant shall not change subconsultant's assignments without the prior written consent of the Chief Procurement Officer. The City shall enforce all social equity Contracting and Disadvantaged, Minority, Women and Emerging Small Business (D/M/W/ESB) subcontracting commitments submitted by the Consultant in its proposals. Failure to use the identified D/M/W/ESB subconsultants without prior written consent is a material breach of Contract.

For Contracts valued \$50,000 or more, the Consultant shall submit a Monthly Subconsultant Payment and Utilization Report (MUR), made part of this Contract by reference, reporting ALL subconsultants employed in the performance of this agreement. An electronic copy of the MUR may be obtained by contacting the PTE Contract Compliance Specialist.

30. Third Party Beneficiaries

There are no third party beneficiaries to this Contract. Enforcement of this Contract is reserved to the parties.

31. Conflict of Interest

Consultant hereby certifies that, if applicable, its Contract proposal is made in good faith without fraud, collusion or connection of any kind with any other proposer of the same request for proposals or other City procurement solicitation(s), that the Consultant as a proposer has competed solely on its own behalf without connection or obligation to, any undisclosed person or firm. Consultant certifies that it is not a City official/employee or a business with which a City official/employee is associated, and that to the best of its knowledge, Consultant, its employee(s), its officer(s) or its director(s) is not a City official/employee or a relative of any City official/employee who: i) has responsibility in making decisions or ability to influence decision-making on the Contract or project to which this Contract pertains; ii) has or shall participate in evaluation or management of the Contract; or iii) has or shall have financial benefits in the Contract. Consultant understands that should it elect to employ any former City official/employee during the term of the Contract then that the former City official/Consultant employee must comply with applicable government ethics and conflicts of interest provisions in ORS Chapter 244, including but not limited to ORS 244.040(5) and ORS 244.047, and the City's Charter, Codes and administrative rules, including lobbying prohibitions under Portland City Code Section 2.12.080.

32. Respectful Workplace Behavior

The City of Portland is committed to a respectful work environment, free of harassment, discrimination and retaliation and other inappropriate conduct. Every individual has a right to work in a professional atmosphere where all individuals are treated with respect and dignity. The City's HR Rule 2.02 covers all employees with the City of Portland as well as consultants, vendors or consultants who provide services to the City of Portland. By signing this Contract/Agreement, the Consultant indicates compliance with all terms and conditions contained in this Contract including HR 2.02.

STATEMENT OF THE WORK AND PAYMENT SCHEDULE

BACKGROUND

Oregon Administrative Rule (OAR) Chapter 333 Division 31, Section 0060(5), requires community water systems to maintain a 20-year Master Plan. The Water Bureau has separated their 20-year Master Plan into two (2) parts: the SSMP; formerly the Infrastructure Master Plan, which provides planning for the supply system, and the Distribution System Master Plan which provides planning for the distribution system. The supply system includes supply from the Bull Run Watershed and the Columbia South Shore Well Field to terminal storage at Powell Butte. The most recent version of the SSMP (formerly the Infrastructure Master Plan) was completed in 2001.

The 2001 Infrastructure Master Plan (IMP) identified the long-term needs and direction for the Water Bureau's backbone supply, storage, and transmission system by considering a number of related issues and activities which could impact future backbone infrastructure needs, such as new drinking water regulations, Endangered Species Act (ESA) requirements, hazard event risk, and wholesale contract renewal. The 2001 IMP recommended policies upon which future supply, transmission, and storage decisions should be made and identified major capital improvements that would be needed in the next 10 to 20 years. It also provided a strategy to guide the integration of future activities into ongoing facility planning.

The first phase of the Supply System Master Plan Project (SSMP or Project) shall be to update some of the technical inputs that were used in developing the 2001 Infrastructure Master Plan. Much of the data collected for the 2001 IMP is still valid and shall be re-used. The second phase of this Project shall be focused on scenario development and analysis to be used to construct a Supply System Road Map. In addition to meeting OAR requirements, the Water Bureau envisions this SSMP to provide not a single "optimized" infrastructure development plan – but, instead, an adaptive supply system plan, or road map, that acknowledges multiple possible future scenarios and identifies a menu of system improvement projects and their contributions to meeting level of service goals.

The final SSMP shall be the guiding document to be used in decision making for Supply System Project for the next 20-years. As such, a key component of this project shall be working with internal and external stakeholders. The second phase of this project shall include a collaborative effort with Water Bureau and the successful proposer to engage with stakeholders to incorporate their feedback and guidance in the development of level of service goals and the final recommendations in the SSMP.

SCOPE OF WORK

The Consultant shall complete the Tasks and Subtasks that are identified and described in detail below:

TASK 100: PROJECT MANAGEMENT

The Consultant shall facilitate a kick-off and chartering meeting to discuss communication, scope, schedule, budget and key deliverables with Water Bureau Project Manager and designated staff and stakeholders; and Consultant team members.

The Consultant shall provide overall management for the Project. The Consultant shall monitor on-going activities, schedule and budget as well as manage technical resources, and coordinate with the Water Bureau Project Manager as needed. On-going activities may include, but are not limited to preparation of alternatives, plan, field investigations, interviews and meetings with Water Bureau staff or stakeholders, and cost estimating.

The Consultant shall prepare a monthly status report covering work completed during the current billing period and work anticipated for the upcoming period. The Consultant shall review the Project's progress with the Water Bureau Project Manager as instructed.

The Consultant shall conduct monthly progress meetings to discuss current Project status and to solicit input from Water Bureau staff regarding current work activities. These meetings shall take place at the beginning of each month for the duration of this Contract and shall be at Water Bureau's offices or via teleconference. The Consultant's staff shall attend or call in as needed and as determined by the Water Bureau Project Manager. The Consultant will determine the date and time of the meeting. The Consultant shall provide meeting notes including key decisions and action items from each meeting to the Water Bureau Project Manager as described in the deliverables section below.

The following shall apply to this task:

- Contract schedule shall dictate the number of meetings; and,
- Two consultant staff per meeting, estimated at two (2) hours each meeting.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

- A status report shall be submitted to the Water Bureau Project Manager by the 15th of each month for the duration of this Contract. The status report shall cover work completed during the current billing period and work anticipated for the upcoming period. The Consultant shall provide the Water Bureau Project Manager a hard copy and an electronic in MS Word or MS Excel, or a format accessible to the Water Bureau Project Manager;
- Project Work Plan, including intermediate milestones and deliverables, shall be provided within one month of the start of the Project and updated with each monthly status report;
- Project Schedule shall be provided within one month of the start of the Project and updated with each monthly status report;
- Meeting Notes shall be prepared and provided within one (1) week of the meeting for the duration of this Contract;
- Both a hard copy and an electronic copy of the Project Work Plan, Project Schedule and updates, and Meeting Notes shall be provided. The electronic copy shall be in MS Word or MS Excel, or a format accessible to the Water Bureau Project Manager; and,
- Consultant shall administer and manage the Project to ensure that all tasks and subtasks the Consultant and their subconsultants are responsible for are properly executed according to sound Project Management Principles, and complete the scope of work and deliverables according to the approved schedule that shall be provided to the Portland Water Bureau's Project Manager and comply and follow the Contract Budget and Task/Subtask Schedule (Exhibit A) attached to this Contract. All exhibits are attached and incorporated as part of this Contract. Invoice and Progress Reporting shall be followed in accordance to the terms of the Contract.

- 1) Progress Reports - Consultant shall provide the Water Bureau Project Manager with monthly summary reports highlighting work progress during the previous month and listing unresolved outstanding issues. One (1) electronic copy of each monthly report shall be submitted to the Water Bureau Project Manager by the 15th of the next month.
- 2) Consultant shall submit invoices and monthly subconsultant utilization reports per the instructions and requirements included to the contract.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Review monthly invoice and status reports. The Water Bureau Project Manager shall provide comments to the Consultant within two (2) weeks of receipt of these documents;
- Participate in monthly progress meetings. The Water Bureau Project Manager or designated Water Bureau staff shall participate in monthly progress meetings via phone or in person; and,
- Review and comment on meeting notes. The Water Bureau Project Manager shall provide comments to the Consultant within two (2) weeks of receipt of these documents.

TASK 200: REVIEW OF WATER BUREAU TECHNICAL MEMORANDA

The Consultant shall provide a peer review of the Water Bureau Technical Memos listed below. The peer review shall provide a subject matter expert review of the technical memo to identify additional perspectives, research, or data that should be considered or included in the Water Bureau Memo.

- Tech Memo 3.1 - Projected Water Demand
- Technical Memo 4.2 – Future Potential regulations and WQ Risk due to Warmer Bull Run Water
- Technical Memo 5.1 – 5.3 – Effect of Climate Change

The following shall apply to this task:

- Up to two (2) meetings per Water Bureau Technical Memo to discuss comments and recommendations. The first meeting shall be to answer Consultant questions to assist in Consultant review. The second meeting shall be subsequent to submittal of final document by Consultant to Water Bureau for review. The Consultant shall allow a minimum of two (2) weeks from submittal of final document for the Water Bureau Project Manager or designated staff to review prior to second scheduled meeting. Meetings shall be organized by Consultant and coordinated with the Water Bureau Project Manager.
- Two (2) of the Consultant's staff shall attend per meeting with each meeting to last approximately two (2) hours per meeting.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

- A written memorandum with comments and expert review for each Water Bureau Technical Memo listed above. Memoranda shall be provided to the Water Bureau Project Manager as a final document Both a hard copy and an electronic copy of the Memos shall be provided. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager
- Meeting notes from review meetings conducted. The Consultant shall provide the meeting notes in both a hard copy and an electronic copy to the Water Bureau Project Manager. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Provide the Technical Memoranda to the Consultant in electronic format

- Participation in review meetings to discuss comments or recommendations
- Retain responsibility for accuracy and quality of Water Bureau Technical Memo content

TASK 300: SUPPLY SOURCE ALTERNATIVES EVALUATION

The Consultant shall evaluate potential supply source alternatives that could be used to meet growth in demand and be used for resiliency, and to perform additional studies on the potential impacts related from using the Water Bureau's groundwater source more frequently and for longer durations.

The Consultant shall review and update the identified supply source alternatives from the 2001 IMP as well as complete an analysis of potential additional sources. The Water Bureau Project Manager or designated staff shall assist the Consultant with a review of work done and any decisions made on supply source alternatives previously identified in the 2001 IMP.

In addition, the Consultant shall be expected to perform the following Sub-Tasks:

Sub-Task 300.1- Review and update supply source alternatives from 2001 IMP

The Consultant shall review and update the supply source alternatives that were discussed in the 2001 IMP. This task shall include incorporating additional analysis and studies regarding feasibility and cost since the 2001 IMP, and updating projected costs and feasibility for all of the supply source alternatives. The Consultant shall also identify potential new supply source alternatives and develop their planning level feasibility and estimated cost to implement. This update shall be presented in Technical Memo 6.1. The Technical Memo shall include:

- Identify/list supply source alternatives from the 2001 IMP.
- Identify any alternatives that have been implemented or discarded due to subsequent additional analysis or other changes. (Provided by Water Bureau)
- Review remaining alternatives for viability and identify additional supply source alternatives not previously identified.
- Update feasibility and costs for each alternative that is still "viable" and develop feasibility and costs for each new alternative.
- Present supply source alternatives.

For this task it is anticipated that a single round of comments from the Water Bureau shall be addressed before finalizing the TM.

Sub-Task 300.2- Perform study of extended groundwater use

The Consultant shall provide the Water Bureau Project Manager with information on the impact of utilizing the Columbia South Shore Well Field (CSSWF) for summer supply augmentation beginning earlier in the year, at lower rates and for longer periods of time. In addition, The Consultant shall simulate scenarios of more frequent use of the CSSWF in its current configuration (base-case) and with added production capacity (future case), utilizing the recently upgraded CSSWF Model. The results shall be used to evaluate potential limitations and adverse impacts from more frequent, longer duration, and potentially higher yield scenarios.

Sub-Task 300.2.1 - Refine Objectives and Define Scenarios

The Consultant shall work with Water Bureau Project Manager or designated staff to refine objectives and define scenarios for the evaluations of extended groundwater use. These tasks shall include the following:

- A. Review TM 6.2.
- B. Develop a written summary with input needed from Water Bureau Project Manager for completing the study, including objectives and scenarios for base-case and expanded CSSWF uses.
- C. Meet with the Water Bureau Project Manager or designated staff to discuss and review the objectives and scenario input received from the Water Bureau.

- D. Finalize scenarios, including current and future wells, rates, durations, well cycling and frequency, duration and types of uses.
- E. Evaluate risks from contaminated sites using groundwater quality data and input from the Water Bureau's Resource Protection Group.
- F. Meet with task team to review findings. Task team shall consist of staff from the Consultant, subconsultant, and Water Bureau staff.

Sub -Task 300.2.2 Calibration Check

The Consultant shall assess the calibration of the CSSWF model relative to a recent, high usage supply event. The objective of the calibration check shall be to compare actual and simulated responses to clarify potential uncertainties regarding limitations and impacts of more frequent and longer duration uses of the wellfield. The completed February/March 2017 supply event shall be used to evaluate calibration of the model for this task. The 2017 winter supply event is the longest duration (one month), near-full capacity supply event (80 – 85 mgd) completed in the CSSWF, and thus represents the greatest pumping stress ever placed on the aquifer system. Prior to this event, the Project team anticipated calibrating the model to the 2015 summer supply event, which extracted the largest volume of water from the CSSWF since its inception in the 1980s; however, the instantaneous rates of withdrawal in 2015 were less than the 2017 event, and the model previously has been calibrated to stresses similar to those of 2015. The Consultant's checking the model's calibration against the higher-intensity pumping of early 2017 shall include the following:

- A. Acquire, compile and process water level, pumping rate and runtime data from Water Bureau, and input into model.
- B. Complete a steady-state initialization model run and a transient pumping event simulation.
- C. Compare drawdown responses for monitoring points in key locations within three (3) aquifers (TSA, SGA, and BLA).
- D. Prepare a brief technical memorandum that summarizes the calibration check results and outlines significant model calibration constraints (if any) that may affect confidence in the evaluation of limitations and impacts of future pumping events.

Sub-Task 300.2.3 Extended Use Simulations

The Consultant shall complete groundwater model simulations to assess constraints and impacts from extended use of the CSSWF under: (1) a "base" case of the current CSSWF configuration and capacity with current levels of pumping by other users, and (2) a future scenario to represent planned expansion of the CSSWF capacity and potentially greater pumping by other users. In order for the Consultant to accomplish these tasks the following shall be completed:

- A. Update model to add any major new production wells completed in the TSA or SGA aquifers that may cause drawdown in Water Bureau production wells.
- B. Set up models to run scenarios developed in Sub-Task B.2.1, including simulating wells owned by other SGA and TSA users, and adding new Water Bureau wells for the future expansion scenario.
- C. Complete simulations of base case and future scenarios.

Sub-Task 300.2.4 Evaluation of Potential Impacts of Extended Groundwater Use

The Consultant shall use the results of the extended-use modeling to evaluate potential capacity limitations and impacts from extended pumping of the CSSWF. The Consultant shall complete the following:

- A. Calculate cumulative interference drawdowns from Clark County and Multnomah County groundwater users at each Water Bureau production well completed in the SGA and TSA, and compare the differences between projected cumulative drawdowns from all users and the drawdowns arising from just Water Bureau's pumping.

- B. Evaluate the reliable capacity of the CSSWF from frequent and longer-duration Water Bureau pumping events, with and without interference from other users, by comparing cumulative drawdowns at each Water Bureau production well with selected operational pumping levels.
- C. Complete limited particle-tracking in the models and review groundwater quality trends to assess the potential for degradation of water quality in deeper aquifers from downward migration of water from shallow aquifers that have high levels of manganese and iron (e.g., the SGA and TSA in the vicinity of Blue Lake).
- D. Evaluate the potential for subsidence due to extended pumping by identifying locations where pumping shall cause extended, large-magnitude drawdowns in aquifers that are in contact with compressible soils.
- E. Work with the Water Bureau's Resource Protection staff to evaluate potential impacts to the CSSWF operations from the presence of contamination, by (a) working to utilize the most recent understanding of existing groundwater contamination and the status and efficacy of remedial actions, and (b) conducting limited particle-tracking around wells in vicinity of known groundwater contamination.

Sub-Task 300.2.5 Documentation

The Consultant shall document the results of the evaluation of extended uses of the CSSWF in TM 6.3. For this task it is anticipated that a single round of comments from Water Bureau shall be addressed before finalizing the TM. The Consultant shall evaluate how well the model simulates a high stress event and accordingly identify important uncertainties with the analyses. This task shall not include any modification of the model parameters to improve calibration.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

- 1. Technical Memo 6.1 for Sub-Task 300.1: Review and update supply source alternatives from 2001 IMP, both draft and final documents. Final document shall incorporate Water Bureau comments.
- 2. Final Technical memo documenting review of Water Bureau Technical Memorandum 6.2.
- 3. Technical Memo 6.3 for Sub-Task 300.2; draft and final documents. The final document shall incorporate Water Bureau comments.
- 4. Meeting notes from up to two (2) review meetings per memo to discuss comments and recommendations.
- 5. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
- 6. Final Technical Memos shall be delivered within one (1) month of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Review of draft deliverables, including Draft Technical Memos 6.1 and 6.3.
- Description of work and decisions made by Water Bureau since 2001 that may affect supply alternatives.
- Release of relevant operational data and measurements to assist in groundwater modeling efforts.
- Participation in planning and review meetings to discuss work approach and results of sub-tasks.
- Provide pertinent pumping and level data from production wells and observation wells.

TASK 400: DEVELOP LEVEL OF SERVICE GOALS

The Consultant shall review the identified Water Bureau level of service goals identified in the Water Bureau's *Technical Memo 7.1 – Review of Existing Water Bureau Level of Service Goals*, identify any potential similar goals used by other water providers, and to develop a set of level of service goals (LSGs) to be used in this project. The

Consultant shall complete a timely review and summary of level of service goals used by other utilities. The Consultant shall lead discussion with the Water Bureau Project Manager or designated staff and stakeholders, and provide the development of level of service goals to be used in scenario analysis for this Project.

The Consultant shall complete two (2) half-day workshops with Water Bureau's designated staff to establish Level of Service Goals (LSGs). Prior to the first workshop, the Consultant shall review *TM 7.1 – Review of Existing Water Bureau Level of Service goals*, collect information on LSGs used by others, and develop materials to facilitate workshop discussion. Based on the collaborative effort from Workshop 1, Workshop 2 the Consultant shall present a draft framework for proposed LSGs and finalize with key stakeholders.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

1. Technical Memo 7.2, draft and final. The Technical Memo shall include:
 - Potential level of service goals used by others in the industry.
 - Description of process and methodology for evaluating level of service goals.
 - Recommendation of level of service goals to be used in this update.
 - Final Technical Memo 7.2 shall incorporate one (1) round of comments from Water Bureau.
2. Facilitate a minimum of two (2) meetings with Water Bureau stakeholders to discuss Technical Memo 7.2. The Consultant shall develop a meeting agenda and receive the Water Bureau's Project Manager or designated staff's approval prior to distribution.
3. Workshops 1 and 2 preparation material and key decision log. The Consultant shall develop a draft agenda for each workshop and give to Water Bureau Project Manager for approval a minimum of one (1) week prior to each Workshop. The Consultant shall incorporate comments from Water Bureau staff prior to finalizing key decision log.
4. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
5. Final Technical Memo shall be delivered within one (1) month of receiving Water Bureau comments.
6. Final key decision log shall be delivered within one (1) week of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Technical Memo 7.1 – Review of Existing Water Bureau Level of Service Goals
- Review and comment for Draft Technical Memo 7.2
- Review and comment for Workshop materials and key decision log
-
- Water Bureau staff participation in Workshops 1 and 2

TASK 500: EVALUATE HAZARD EVENT RISK AT GROUNDWATER

The Consultant shall update potential risk related to hazard events at Water Bureau Groundwater facilities, including the Groundwater Pump Station and associated treatment and the well field. The Consultant shall note that the risk of not having the Groundwater system available as a backup may have changed since the 2001 System Vulnerability Assessment and the 2001 IMP.

The Consultant shall evaluate the potential risks at Water Bureau Groundwater facilities to include the pump station and associated treatment and well field. The previous vulnerability assessment was completed in 2001 (2001 System Vulnerability Assessment study and 2001 IMP) and shall be updated to reflect current hazard conditions and risks.

In addition to the tasks listed above the Consultant shall perform the following:

A. Hazard Identification

The Consultant shall meet with the Water Bureau Project Manager and designated staff and stakeholders in Workshop 3 (half-day) to identify and list potential hazards that can result in outage of the groundwater system. The Consultant shall include potential hazards explored such as power outages in the wellfield and at the pump station due to extreme hot weather temperatures, power disruption, and contamination at the wellfield. The Consultant shall provide the Water Bureau Project Manager with a list of potential hazards, by facility to be considered as a result of Workshop 3.

B. TM Development

The Consultant shall assemble the results and incorporate the findings into a TM describing the evaluation and quantified ranking of risk of power outages, contamination, physical security risks and other identified risks. Each risk shall include a numeric likelihood of failure value (risk return period) and a list of any noted vulnerabilities. The TM shall also include a compilation of information developed by the Water Bureau from recent seismic studies, asset management plan, and vulnerability assessment documents.

Note Consequence of failure shall not be characterized as part of this task. Water Bureau staff shall use calculate likelihood of failure to update internal risk matrix results, consistent with other Water Bureau studies.*

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

1. Technical Memo 8.3: draft and final and supporting data that can be incorporated into the SSMP. The Technical Memo shall include:
 - Evaluation and quantification of likelihood of power outage at the Groundwater Pump Station and individual well sites, both due to extreme hot spells or wind/rain/ice events.
 - Likelihood of contamination in the wellfield.
 - Any other wellfield risks evaluated.
2. Final Technical Memo 8.3 shall incorporate one (1) round of comments from the Water Bureau Project Manager or designated staff.
3. Workshop 3 presentation materials and key decision log. The Consultant shall develop a draft agenda for each workshop and give to Water Bureau Project Manager for approval a minimum of one (1) week prior to each Workshop. Consultant shall incorporate comments from Water Bureau staff prior to finalizing key decision log.
4. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
5. Final Technical Memo shall be delivered within one (1) month of receiving Water Bureau comments.
6. Final key decision log shall be delivered within one (1) week of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Documents to be used in compilation of risks including asset management plans, seismic study and other system vulnerability plans.
- Participation by Water Bureau staff in Workshop 3
- Review and comment for draft TM 8.3
- Review and comment of Workshop materials and key decision log.

TASK 600: UPDATE BULL RUN SUPPLY HAZARD EVENT RISK

The Consultant shall compile an updated potential risk related to hazard events with the Bull Run Supply including the reservoirs, headworks, and conduits, with subsequent risk work since the 2001 System Vulnerability Assessment and the 2001 IMP. The previous vulnerability assessment was completed in 2001 (2001 System Vulnerability Assessment study and 2001 IMP) and shall be updated to reflect current hazard conditions and risks.

In addition to the tasks listed above the Consultant shall perform the following:

A. Hazard Identification

The Consultant shall meet with the Water Bureau Project Manager and designated staff and stakeholders in Workshop 4 (half-day) to identify and list potential hazards that can result in outage of the Bull Run supply. The Consultant shall include potential hazards explored and review those identified in existing reports, including but not limited to:

- Bull Run Treatment Asset Management Plan
- Bull Run Supply Asset Management Plan
- Conduits Asset Management Plan
- Water System Seismic Study
- 2001 System Vulnerability Assessment
- 2001 IMP
- 2016 Natural Hazard Mitigation Plan Update (CoP)

The Consultant shall provide the Water Bureau Project Manager with a list of potential hazards to be considered as a result of Workshop 4.

B. TM Development

The Consultant shall assemble the results and incorporate the findings into a TM describing the evaluation and quantified ranking of identified risks. Each risk shall include a numeric likelihood of failure value (risk return period) and a list of any noted vulnerabilities.

Note Consequence of failure shall not be characterized as part of this task. Water Bureau staff shall use calculate likelihood of failure to update internal risk matrix results, consistent with other Water Bureau studies.*

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

1. Technical Memo 8.4, draft and final. The Technical Memo 8.4 and supporting data shall be incorporated into the SSMP. The Technical Memo shall include:
 - Compilation of risks to the Bull Run Supply from existing documents and report.
 - Ranking of identified risks.
2. Final Technical Memo 8.4 shall incorporate one round of comments from the Water Bureau Project Manager or designated staff.
3. Workshop 4 presentation materials and key decision log. The Consultant shall develop a draft agenda for each workshop and give to Water Bureau Project Manager for approval a minimum of one (1) week prior to each Workshop. Consultant shall incorporate comments from Water Bureau staff prior to finalizing key decision log.
4. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
5. Final Technical Memo shall be delivered within one (1) month of receiving Water Bureau comments.
6. Final key decision log shall be delivered within one (1) week of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Documents to be used in compilation of risks including asset management plans, seismic study and other system vulnerability plans.
- Participation by Water Bureau staff in Workshop 4
- Review and comment for draft TM 8.4
- Review and comment of Workshop materials and key decision log

TASK 700: SCENARIO DEVELOPMENT AND ANALYSIS

The Consultant shall develop supply system improvement scenarios and evaluate those scenarios. The final SSMP is not intended to provide a single “optimized” infrastructure development plan – but, instead, an adaptive supply system plan that acknowledges multiple possible futures (trajectories), identifies a menu of system improvement projects, defines the contributions those projects make to meeting service goals and under what circumstances, and identifies key decision milestones for taking adaptive action to ensure an adequate water supply. The Consultant shall utilize the information from all previous Tasks to incorporate into the SSMP. The Consultant shall include details to be modeled after portions of Section 9 of the 2000 Supply, Storage, and Transmission Analysis (STSA).

In addition, the Consultant shall perform the following:

Sub-Task 700.1- Develop Methodology

The Consultant shall develop methodology for establishing and evaluating the scenarios and building the system road map. This methodology shall include elements of scenario planning, robust decision making, or other similar decision support methods and software. The Consultant shall facilitate Workshop 5 (half-day) to review the recommended approach.

Sub-Task 700.2- Develop and Evaluate Scenarios

- The Consultant shall develop scenarios to respond to a range of plausible future supply/demand trajectories. The Consultant shall use previous TM’s, including Water Bureau TM’s completed as part of this Project shall be used in defining the trajectories and building the scenarios.

Scenario development shall take place in a series of Water Bureau staff surveys and a workshop. Initially, drivers that affect potential future paths or trajectories shall be identified through surveys with Water Bureau staff and other stakeholders as applicable. The full set of drivers shall be narrowed to key uncertainties – those that are the most important (have the biggest impact) and are the most uncertain. The potential plausible range of the uncertainties shall be explored in a Workshop 6 (half-day) with Water Bureau staff. The ranges of uncertainties shall be logically collided, resulting in up to five scenarios. These collisions shall be developed in Workshop 6 with Water Bureau staff. With this information, the Consultant shall develop narratives of the future and coordinate quantification of the narratives.

- The Consultant shall develop and evaluate the scenarios based on the degree to which they meet the level of service goals identified in TM 7.2. The risks and tradeoffs for meeting service level goals to a lesser or greater degree shall be described, including a sensitivity analysis to determine the circumstances under which a scenario would “fail” or not meet a baseline level of service.
- The Consultant shall develop a water management tool that integrates supply and demand and allows for exploration of the quantified scenarios as defined in TM 9.1 Once quantified. A base case of the existing system shall be simulated and gap analysis completed by the Consultant, with gaps representing either the inability to supply demands or meet LSGs under the developed scenarios. The Consultant shall develop alternatives for future water supply and management options coordinating with the Water Bureau Project Manager or designated staff.
- The Consultant shall develop planning level costs for the various alternatives. Alternatives shall be characterized for their individual impact to gaps and LSGs through structured simulations/analysis. Alternative selection for portfolios to address the scenarios shall be based on these results, coupled with the scenario narratives and criteria developed with the Water Bureau Project Manager or designated staff. Portfolios shall be simulated and impact to gaps and LSGs noted. Likewise, alternative portfolios shall be developed by the Consultant to examine alternative trade-offs.
- The Consultant shall review budget, level of effort, and schedule to complete the remainder of the task Adjustments to approach or budget shall be completed as required to fully implement the agreed approach and apply defined tools.

- The Consultant shall use Workshop 7 to provide direction for minor adjustments and final simulations to be performed once an initial (preliminary) collection of alternatives and scenarios are defined and evaluated. After this second round of simulation and analysis, there shall be no further refinements or evaluation of alternatives are assumed for this task.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

1. Each workshop shall be one-half day. Workshops shall be coordinated by the Consultant. For each workshop, an agenda shall be provided by the Consultant to the Water Bureau Project Manager for approval a minimum of two (2) weeks prior to the workshop.
2. Technical Memoranda 9.1: draft and final. The Consultant shall complete Technical Memo 9.1 in support of sub-task 700.1 and supporting data that can be incorporated into the SSMP. The Technical Memo shall include:
 - Process for selecting and customizing decision making tools.
 - Definition of tools to be used. (e.g., a particular software package, charts, spreadsheets).
 - Definition/explanation of decision making criteria. Including but not limited to any associated weighting or ranking. The Consultant shall explain nexus between level of service goals and decision making criteria.
 - Description of the trends and uncertainties to be considered when constructing the trajectories and scenarios in Sub- Task 700.2.
 - Recommendations for how to engage key Water Bureau stakeholders in the scenario development and evaluation process.
3. Technical Memoranda 9.2: draft and final. The Consultant shall complete Technical Memo 9.2 in support of sub-task 700.2 and supporting data that can be incorporated into the SSMP. The Consultant shall use the half – day Workshop 7 to review the findings of the preliminary technical analysis and provide direction for minor revision or limited subsequent simulations to support development of the SSMP. The Technical Memo shall include:
 - Definition of approximately three (3) to five (5) plausible future supply/demand trajectories (e.g., conditions that result in low, medium, and high need for additional supply).
 - Definition of at least one (1) supply improvement scenario to serve the needs of each trajectory. The scenarios are expected to be built from a menu of relevant and feasible new supply increments/system improvements.
 - Ranking of identified menu options for new supply increments.
 - Description of the financial implications of each trajectory using the modeling results.
 - Results of scenario evaluation using the selected decision making tool, including analysis of risks and tradeoffs.
 - Description of the relative interchangeability of scenario components for purposes of adapting from one trajectory to another based on changing conditions.
 - Documentation of how the evaluation considered input and direction from key Water Bureau stakeholders.
 - Presentation materials and key decision logs from Workshops 5, 6, and 7. The Consultant shall develop a draft agenda for each workshop and give to Water Bureau Project Manager for approval a minimum of one (1) week prior to each Workshop. Consultant shall incorporate comments from Water Bureau staff prior to finalizing key decision log.
4. Technical Memo 9.1 and 9.2 shall include one (1) draft and one final. The final tech memo shall incorporate one (1) round of comments from the Water Bureau.
5. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
6. Final Technical Memos shall be delivered within one (1) month of receiving Water Bureau comments.
7. Final key decision log shall be delivered within one (1) week of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Participation by Water Bureau staff in Workshops 5, 6, and 7.
- Water Bureau staff review of draft memoranda and consolidated comments for each.

TASK 800: DEVELOP SUPPLY SYSTEM ROAD MAP

The Consultant shall take the scenario development and analysis from Task 700 and construct a supply system “road map”. This “road map”, or similar application, shall include projected paths or trajectories, with identified potential “off-ramps” that can be implemented to respond to triggers or milestones that are reached.

The Consultant shall be expected to perform the following tasks:

Sub-task 800.1- Develop Supply System Road Map

The Consultant shall develop a Supply System Road Map that describes increments and types of supply needed to address a reasonable range of possible future supply/demand conditions (trajectories) or risk reduction goals from Technical Memo 9.1 and 9.2. The road map shall define interim milestones and shall be used to enable the Water Bureau to make supply improvement choices at those milestones, and adapt if actual conditions are different than anticipated.

The Consultant shall conduct Workshop 8 (half-day) with the Water Bureau Project Manager and designated staff to develop an adaptive management framework that examines potential trends and triggers for future conditions as well as defines how new information shall be incorporated into the plan. This framework for decision making could be as simple as an observation approach with periodic reassessment or as complex as a multi-objective optimization approach for decision making. Depending on the framework chosen, simulations shall be completed to estimate likely trigger points. These trigger points shall define a given trajectory and the associated portfolio or actions needed in response to the defined condition.

Sub-task 800.2- Identify Projects

In addition to development of the road map, the Consultant shall take the scenario development and analysis performed and identify any projects that should be started within five (5) years. This task shall include discussion on project timing, schedule and budget to plan, permit, and complete the work. This work shall be included in a separate Technical Memo to be incorporated into the SSMP.

- The Consultant shall work with Water Bureau staff to identify any projects that should be started within the first 5 years using the Supply System Road Map and analysis performed.
- Cost estimates for projects within 5-year start shall be Class 4 level cost estimates. No detailed engineering work is planned for this task.
- Some recommended or adopted strategies for implementing the adaptive plan may require development or application of tools and data sets outside this scope of work.

DELIVERABLES

1. Each workshop shall be one (1) half day. Workshops shall be coordinated by Consultant. For each workshop, an agenda shall be provided by the Consultant to the Water Bureau Project Manager for approval a minimum of two (2) weeks prior to the workshop.
2. Presentation materials and key decision log from Workshops 8. Consultant shall develop a draft agenda for each workshop and give to Water Bureau Project Manager for approval a minimum of one week prior to each Workshop. The Consultant shall incorporate comments from Water Bureau staff prior to finalizing key decision log.
3. Technical Memoranda 10.1: draft and final. The Consultant shall complete Technical Memo 10.1 in support of sub-task 800.1 and supporting data that can be incorporated into the SSMP. The Technical Memo shall include:
 - A supply road map based on approximately three (3) to five (5) future supply/demand trajectories.
 - At least one (1) interim re-evaluation and decision milestone per trajectory, to include special consideration for any circumstances that would require a decade or more of warning to react and adapt effectively.
 - Identification of supply or demand conditions and trends that shall be monitored or re-evaluated to enable adaptive decision making.

- Recommended tools for monitoring changing conditions (e.g., update demand modeling every five years).
 - Presentation materials and key decision log from Workshop 8.
4. Technical Memoranda 10.2: draft and final. The Consultant shall complete Technical Memo 10.2 in support of sub-task 800.2 and supporting data that can be incorporated into the SSMP. The Technical Memo shall include:
 - Definition of projects.
 - When projects should be initiated.
 - Projected cost and schedule required for each project. Lead time for identification of major projects and funding, time for a solicitation process, and time for permitting shall be included.
 - Justification for starting project.
 5. Technical Memo 10.1 and 10.2 shall include one draft and one final. The final tech memo shall incorporate one round of comments from the Water Bureau.
 6. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
 7. Final Technical Memos shall be delivered within one month of receiving Water Bureau comments.
 8. Final key decision log shall be delivered within one week of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Review and comment by Water Bureau staff on TMs 10.1 and 10.2
- Water Bureau staff participation in Workshop 8

TASK 900: PREPARE FINAL REPORT

The Consultant shall summarize and compile the TM's, studies, data, analysis, and recommendations into a final SSMP report and Appendices. The final report format shall include an Executive Summary and supporting Appendices including TM's prepared by the Water Bureau as well as the Consultant.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

1. Initial and revised drafts of the SSMP.
2. Final version of the SSMP.
3. All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word or a format accessible to the Water Bureau Project Manager.
4. Final Technical Memos shall be delivered within one (1) month of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Review and comment on format, outline, and draft deliverable materials. A minimum of three (3) weeks shall be allotted for each review for Water Bureau to review and compile comments.
- Provide one (1) set of consolidated comments for initial draft and a revised draft.

TASK 1000: PUBLIC INFORMATION AND STAKEHOLDER INVOLVEMENT

A. Assist with External Stakeholder Communications

The Consultant shall work with the Water Bureau Project Manager and designated staff on public information efforts for the duration of this Contract. The Consultant shall develop and lead an external stakeholder process to help inform direction and recommendations to the Water Bureau Project Manager. The Consultant shall coordinate with the Water Bureau's Project Manager and the Water Bureau's Public Information Office (PIO) group on the

specific tasks to be provided by the Consultant. Tasks may include but not be limited to presentations to City council, presentations at stakeholder meetings, neighborhood meetings and/or to various groups within Water Bureau.

The Consultant shall be required to submit to the Water Bureau Project Manager any assigned presentation for review and comment prior to completing presentation for any work group or for the public and must receive written approval to perform the presentation.

B. Coordinate and Lead Stakeholder Comment and Participation

The Consultant shall develop and lead an external, i.e. public, stakeholder input process during development of the SSMP. The external stakeholders shall be determined by the Water Bureau Project Manager. External stakeholder input will be as per identified in coordination with Water Bureau staff. This process may include discussion of scenario evaluation results, levels of service, and final recommendations. This shall be used during development and in support of the Supply System Road Map and final SSMP. This Sub-Task shall include documentation of the process, who was involved, feedback that was received, and any decisions or action items that resulted from this process. The Consultant shall coordinate with Water Bureau Project Manager or designated staff and receive prior approval for all external communications and processes.

DELIVERABLES

The Consultant shall provide the Water Bureau Project Manager with the following deliverables:

1. Technical Memoranda 12.1: draft and final. The Consultant shall complete Technical Memo 12.1 and supporting data that can be incorporated into the SSMP. The Technical Memo shall include:
 - Definition of the external stakeholder process used for scenario analysis.
 - Description of organization of meetings and process and meeting minutes.
 - Stakeholder input.
 - All documents, including drafts, shall be provided in both a hard copy and an electronic copy. The electronic copy shall be in MS Word, MS Excel, or a format accessible to the Water Bureau Project Manager.
 - Final Technical Memos shall be delivered within one (1) month of receiving Water Bureau comments.

WORK PERFORMED BY WATER BUREAU

The Water Bureau Project Manager or designated staff shall complete the following:

- Review and comment on format, outline, and draft deliverable materials. A minimum of three weeks shall be allotted for each review for Water Bureau to review and compile comments.

PUBLIC SAFETY

Public safety may require limiting access to public work sites, public facilities, and public offices, sometimes without advance notice. The Consultant shall anticipate delays in such places. The Consultant's employees and agents shall carry sufficient identification to show by whom they are employed and display it upon request to security personnel. City Project Managers have discretion to require the Consultant's employees and agents to be escorted to and from any public office, facility or work site if national or local security appears to require it.

CONSULTANT PERSONNEL

The Consultant shall assign the following personnel to do the work in the capacities designated:

NAME	ROLE ON PROJECT
Mark Anderson	Project Manager
Katie Bethards	Project Accountant
Mark Bransom	Supply Alternatives Lead
Ken Carlson	Watershed Management
Greg Gates	Plan Development Lead
Forrest Gist	Hazard/Risk Lead
Scott Haskins	Senior Strategic Advisor
Brittany Hughes	Project Controls
Tyler Jantzen	Project Engineer
Dale Jutila	Senior Strategic Advisor
Tom McLean	Senior Strategic Advisor
Armin Munevar	Senior Technologist
Lee Odell	Water Quality
Phil Pasteris	Climate Change Analyst

Brad Phelps	Senior Technologist
Brian Skeens	Water Demand Lead
Dan Speicher	Decision Science
Kelli Walters	Junior Project Engineer
Adrianne Yang	Senior Project Engineer

SUBCONSULTANTS

The Consultant shall assign the following subconsultants to perform work in the capacities designated:

NAME	DMWESB CERTIFICATION TYPE	ROLE ON PROJECT	SUBCONTRACT AMOUNT
GSI Water Solutions	OBE	Groundwater Modeling	\$130,165
JLA Public Involvement	DBE	Public Information	\$59,406
Ott-Sakai & Associates	DBE	Risk analysis, cost estimating	\$36,544

The City shall enforce all social equity Contracting and Disadvantaged, Minority, Women and Emerging Small Business (D/M/W/ESB) subcontracting commitments submitted by the Consultant in its Proposal. For Contracts valued \$50,000 or more, the Consultant shall submit a Monthly Subconsultant Payment and Utilization Report (MUR), made part of this Contract by reference, reporting ALL subconsultants employed in the performance of this agreement. A copy of the Subconsultant Change Request Form can be found on Procurement Services' website under Consultant Resources.

COMPENSATION

The maximum compensation shall not exceed **\$795,358**. The "not to exceed amount" is the maximum amount of compensation due the Consultant for all the work required by the contract, including reimbursable expenses, if any. Errors in estimating the number of hours necessary to perform the work is the sole responsibility of the Consultant. Nothing in this contract requires the City to pay for work that does not meet the Standard of Care or other requirements of the Contract. The actual amount to be paid to the Consultant may be less than that amount. Hourly rates

Any estimate of the hours necessary to perform the work is not binding on the City. The Consultant remains responsible if the estimate proves to be incorrect. Exceeding the number of estimated hours of work does not impose any liability on the City for additional payment. If work is completed before the "not to exceed" amount is reached, the Consultant's compensation shall be based on the Consultant's bills previously submitted for acceptable work performed and approved.

Hourly Rates - The Consultant shall be compensated in accordance with the attached Exhibit B. Hourly Rates are provided for each classification and shall remain the same through the term of the Contract.

Unless authorized by a written Amendment to the Contract no additions or changes shall be made to this Contract. The cost submitted by the Consultant's must remain constant for the duration of the contract.

Standard Reimbursable Costs

The following costs shall be reimbursed without mark-up:

- Travel, including mileage, beyond a 100-mile radius of Portland when specifically required by the Contract;
- Document reproduction directly attributable to the Contract; and,
- Approved Reimbursable Direct Costs.

Travel Expenses

It is the policy of the City that all travel shall be allowed only when the travel is essential to the normal discharge of Consultant's responsibilities under the Contract. All travel shall be conducted in the most efficient and cost-effective manner resulting in the best value to the City. Consultant's Project Manager shall provide a written advance request for any upcoming trips for approval by City Project Manager.

The travel must comply with all the requirements set forth in this section and must be for official City business only. Personal expenses shall not be authorized at any time. All expenses are included in the total maximum Contract amount. In addition to meals and lodging, travel expenses shall be reimbursed for airfare and rental vehicles only if Consultant is acting within the course and scope of his/her duties under this Contract. Receipts are required for all out-of-state travel expenses. All Consultant representatives shall fly "coach class," unless Consultant personally pays the

difference. All Consultant representatives shall be limited to economy or compact size rental vehicles, unless Consultant personally pays the difference.

For any exceptions to the expense items listed above, Consultant must obtain the separate written approval of City's Project Manager in writing prior to incurring any expense for which reimbursement shall be sought. The City shall not pay any mark up over actual allowable reimbursement costs.

Subconsultant Costs

Compensation for subconsultants shall be limited to the same restrictions imposed on the Consultant. The maximum markup on subconsultant services shall not exceed 5%.

Progress Payments

Compensation to the Consultant shall be based on invoices, monthly MUR reports and detailed monthly Project progress reports submitted to the PWB, which shall document completion of Project task/subtask or work order and provide detailed documentation of Project activity by the Consultant (including subconsultants). The Consultant is required to follow Generally Accepted Accounting Principles (GAAP). Personal expenditures or expenditures not related to the Project or part of the Contract are not eligible for reimbursement. On or before the 15th of each month, the Consultant shall submit to the Water Bureau's Accounts Payable Department an Invoice for work performed by the Consultant during the preceding month. The Consultant shall enter all pertinent information below on their invoice in order for the City to review and authorize processing of invoices for payment. The Invoice shall contain the following:

- A. The City's Project Manager's name (Jodie Inman)
- B. Invoice date
- C. Date range during which the services and work being invoiced for were provided
- D. Invoice number that ends in a "##", which represents the correct invoice sequence of issue. The last invoice submitted on the Project must be clearly labeled "Final Invoice"
- E. The correct Contract number
- F. Original Contact total, not to exceed amount broken out by: Phase(s), Task, Subtask, an/or Work Order (as applicable)
- G. If any, statement of changes to the original total, not to exceed amount by amendment(s) and broken out in the same way as in item F of this section, showing the revised Contract amount
- H. Paid to date amount showing the amounts submitted for prior to the current invoice (regardless of payment status) and broken out the same way as in item F of this section
- I. Amount being invoiced for in the current invoice and broken out the same way as in item F of this section, with a roll up of a "Total Amount Billed for This Invoice" line item amount
- J. Balances Remaining after receipt of payment for the current invoice broken out the same way as in item F of this section
- K. Consultant shall describe all Services performed with particularity and by whom it was performed (Consultants individual or subconsultant, labor category, direct labor rate, hours worked during the period) and shall itemize and explain all expenses for which reimbursement is claimed. Reimbursable Expenses shall be broken out into to line item categories, 1) Travel Expenses and 2) General Reimbursable Expenses. Invoices for Basic Services under a specific Phase and Task shall be for completed Basic Services only and shall indicate the percentage of the total Basic Services for that Phase and Task that the amount invoiced represents.
- L. The Consultant shall also attach photocopies of claimed reimbursable expenses, if applicable
- M. The Consultant shall stamp and approve all subconsultant invoices and note on the subconsultant invoice what they are approving as "billable" under the contract
- N. The billing from the prime should clearly roll up labor and reimbursable costs for the prime and subconsultants – matching the subconsultant invoices

Prior to initial billing, the Consultant shall develop a billing format for approval by the City. Submission of the draft billing document shall be emailed to the City's Project Manager at Jodie.Inman@portlandoregon.gov for final review and approval.

The Invoice, monthly MUR reports and detailed monthly Project progress report shall be e-mailed to:
wbaps@portlandoregon.gov

A copy of the monthly MUR report shall also be emailed to the City Procurement Compliance Specialist at:
Brenda.Scott@portlandoregon.gov

The City shall make payments to which no dispute exists within 30 days of receipt of the invoice and only after receipt and approval of Consultant's detailed monthly invoice, and all reports, designs, certificates, and documents covered by the invoice have been submitted. Payment of any bill, however, does not preclude the City from later determining that an error in payment was made and from withholding the disputed sum from the next progress payment until the dispute is resolved.

Consultant agrees that the City has no direct or indirect contractual obligation or other legal duty whatsoever to pay the Sub-consultants and other subcontractors of Consultant or otherwise ensure that Consultant makes full and timely payment to those Sub-consultants and subcontractors for services performed on the Project. The Consultant shall make full payment to its subconsultants within 10 business days following receipt of any payment made by the City to Consultant.

Automated Clearing House Payments

It is the City's policy to pay its Consultant invoices via electronic funds transfers through the automated clearing house (ACH) network. To initiate payment of invoices, Consultants shall execute the City's standard ACH Vendor Payment Authorization Agreement. Upon verification of the data provided, the Payment Authorization Agreement shall authorize the City to deposit payment for services rendered directly into Consultant accounts with financial institutions. All payments shall be in United States currency.

WORKERS' COMPENSATION INSURANCE STATEMENT

IF YOUR FIRM HAS CURRENT WORKERS' COMPENSATION INSURANCE, CONSULTANT MUST SIGN HERE:

I, undersigned, am authorized to act on behalf of entity designated below, and I hereby certify that this entity has current Workers' Compensation Insurance.

Consultant Signature: _____ Date: _____ Entity: _____

IF YOUR FIRM DOES NOT HAVE CURRENT WORKERS' COMPENSATION INSURANCE, CONSULTANT MUST COMPLETE THE FOLLOWING INDEPENDENT CONSULTANT CERTIFICATION STATEMENT:

As an independent Consultant, I certify that I meet the following standards:

1. The individual or business entity providing labor or services is registered under ORS Chapter 701, if the individual or business entity provides labor or services for which such registration is required;
2. Federal and state income tax returns in the name of the business or a business Schedule C or form Schedule F as part of the personal income tax return were filed for the previous year if the individual or business entity performed labor or services as an independent Consultant in the previous year; and
3. The individual or business entity represents to the public that the labor or services are to be provided by an independently established business. Except when an individual or business entity files a Schedule F as part of the personal income tax returns and the individual or business entity performs farm labor or services that are reportable on Schedule C, an individual or business entity is considered to be engaged in an independently established business when four or more of the following circumstances exist. Consultant: check four or more of the following:

- _____ A. The labor or services are primarily carried out at a location that is separate from the residence of an individual who performs the labor or services, or are primarily carried out in a specific portion of the residence, which portion is set aside as the location of the business;
- _____ B. Commercial advertising or business cards as is customary in operating similar businesses are purchased for the business, or the individual or business entity has a trade association membership;
- _____ C. Telephone listing and service are used for the business that is separate from the personal residence listing and service used by an individual who performs the labor or services;
- _____ D. Labor or services are performed only pursuant to written Contracts;
- _____ E. Labor or services are performed for two or more different persons within a period of one year; or
- _____ F. The individual or business entity assumes financial responsibility for defective workmanship or for service not provided as evidenced by the ownership of performance bonds, warranties, errors and omission insurance or liability insurance relating to the labor or services to be provided.

Consultant Signature

Date

FOR CITY USE ONLY

PROJECT MANAGER-COMPLETE ONLY IF CONSULTANT DOES NOT HAVE WORKER'S COMPENSATION INSURANCE

ORS 670.600 Independent Consultant standards. As used in various provisions of ORS Chapters 316, 656, 657, and 701, an individual or business entity that performs labor or services for remuneration shall be considered to perform the labor or services as an "independent consultant" if the standards of this section are met. The Contracted work meets the following standards:

1. The individual or business entity providing the labor or services is free from direction and control over the means and manner of providing the labor or services, subject only to the right of the person for whom the labor or services are provided to specify the desired results;
2. The individual or business entity providing labor or services is responsible for obtaining all assumed business registrations or professional occupation licenses required by state law or local government ordinances for the individual or business entity to conduct the business;
3. The individual or business entity providing labor or services furnishes the tools or equipment necessary for performance of the Contracted labor or services;
4. The individual or business entity providing labor or services has the authority to hire and fire employees to perform the labor or services;
5. Payment for the labor or services is made upon completion of the performance of specific portions of the project or is made on the basis of an annual or periodic retainer.

City Project Manager Signature

Date

CONSULTANT SIGNATURE:

This Contract may be signed in two (2) or more counterparts, each of which shall be deemed an original, and which, when taken together, shall constitute one and the same Agreement.

The parties agree the City and Consultant may conduct this transaction, including any Contract amendments, by electronic means, including the use of electronic signatures.

I, the undersigned, agree to perform work outlined in this Contract in accordance to the STANDARD CONTRACT PROVISIONS, the terms and conditions, made part of this Contract by reference, and the STATEMENT OF THE WORK made part of this Contract by reference; hereby certify under penalty of perjury that I/my business am not/is not in violation of any Oregon tax laws; hereby certify that my business is certified as an Equal Employment Opportunity Affirmative Action Employer and is in compliance with the Equal Benefits Program as prescribed by Chapters 5.33.076 and 5.33.077 of Code of the City of Portland; and hereby certify I am an independent consultant as defined in ORS 670.600.

CH2M HILL ENGINEERS, INC.

BY: _____ Date: _____

Name: _____

Title: _____

CONTRACT NUMBER: 30005914

CONTRACT TITLE: Supply System Master Plan

CITY OF PORTLAND SIGNATURES:

By: N/A Date: _____
Bureau Director

By: _____ Date: _____
Chief Procurement Officer

By: N/A Date: _____
Elected Official

Approved:

By: N/A Date: _____
Office of City Auditor

Approved as to Form:

By: _____ Date: _____
Office of City Attorney

EXHIBIT A, Budget and Task Schedule Task Number Task Name		CH2M				Subconsultants						PROJECT TOTAL
		Total Hours	Labor Total	Expense Total	CH2M TOTAL	GSI		JLA		OTT-SAKAI		
						Hours	Total	Hours	Total	Hours	Total	
100 Project Management		312	\$ 59,225	\$ 100	\$ 59,325	74	\$ 11,550	\$ 24	\$ 2,938	\$ 3	\$ 650	\$ 74,463
100.1 Chartering		44	\$ 10,571	100	\$ 10,671	8	\$ 1,320	4	\$ 490	1	\$ 217	\$ 12,697
100.2 Work Plan		52	\$ 11,015	0	\$ 11,015	18	\$ 2,790	8	\$ 979	2	\$ 433	\$ 15,218
100.3 Monthly Reports and Invoices		96	\$ 11,180	0	\$ 11,180	36	\$ 5,100	0	\$ -	0	\$ -	\$ 16,280
100.4 Monthly Meeting with PWB, Meeting Minutes		120	\$ 26,459	0	\$ 26,459	12	\$ 2,340	12	\$ 1,469	0	\$ -	\$ 30,268
200 Review of PWB Technical Memos		162	\$ 41,098	\$ -	\$ 41,098	12	\$ 2,060	\$ 4	\$ 499	\$ -	\$ -	\$ 43,657
200.1 TM 3.1 Projected Demands		42	\$ 9,260	0	\$ 9,260	0	\$ -	0	\$ 0	0	\$ 0	\$ 9,260
200.2 TM 4.2 Regulations, Water Quality Risks		58	\$ 15,360	0	\$ 15,360	5	\$ 775	0	\$ 0	0	\$ 0	\$ 16,135
200.3 TM 5.1 - 5.3 Effect of Climate Change		58	\$ 15,601	0	\$ 15,601	5	\$ 895	0	\$ -	0	\$ -	\$ 16,496
200.4 Meeting with PWB to review findings		4	\$ 878	0	\$ 878	2	\$ 390	4	\$ 499	0	\$ -	\$ 1,767
300 Supply Source Alternatives Evaluation		482	\$ 99,797	\$ 1,000	\$ 100,797	543	\$ 82,165	0	\$ -	0	\$ -	\$ 182,962
300.1 Review, update supply alternatives from 2001 IMP		430	\$ 85,910	1000	\$ 86,910	88	\$ 14,280	0	\$ -	0	\$ -	\$ 101,190
300.2 Perform Study of Extended Groundwater Use		52	\$ 13,887	0	\$ 13,887	455	\$ 67,885	0	\$ -	0	\$ -	\$ 81,772
400 Develop Level of Service Goals		92	\$ 22,389	\$ 2,000	\$ 24,389	0	\$ -	44	\$ 5,494	0	\$ -	\$ 29,883
400.1 Review TM 7.1 Level of Service Goals		18	\$ 4,403	0	\$ 4,403	0	\$ -	0	\$ -	0	\$ -	\$ 4,403
400.2 Review, summarize other utilities LOS Goals		50	\$ 12,484	0	\$ 12,484	0	\$ -	20	\$ 2,497	0	\$ -	\$ 14,982
400.3 Facilitate Discussions of LOS Goals w/Stakeholders (Workshops 1 and 2)		24	\$ 5,501	2000	\$ 7,501	0	\$ -	24	\$ 2,997	0	\$ -	\$ 10,498
500 Evaluate Hazard Event Risk at Groundwater		78	\$ 21,397	\$ -	\$ 21,397	56	\$ 8,200	8	\$ 999	0	\$ -	\$ 30,596
500.1 Review risk Hazards at Groundwater Facilities (Includes Workshop 3)		52	\$ 14,190	0	\$ 14,190	32	\$ 4,800	0	\$ -	0	\$ -	\$ 18,990
500.2 Prepare TM 8.3 Summarizing Risk Hazards		26	\$ 7,207	0	\$ 7,207	24	\$ 3,400	8	\$ 999	0	\$ -	\$ 11,606
600 Update Bull Run Supply Hazard Event Risk		106	\$ 24,578	\$ -	\$ 24,578	0	\$ -	12	\$ 1,498	0	\$ -	\$ 26,077
600.1 Review risk Hazards at Bull Run Facilities (Includes Workshop 3)		68	\$ 16,928	0	\$ 16,928	0	\$ -	0	\$ -	0	\$ -	\$ -
600.2 Prepare TM 8.3 Summarizing Risk Hazards		38	\$ 7,651	0	\$ 7,651	0	\$ -	12	\$ 1,498	0	\$ -	\$ -
700 Scenario Development and Analysis		728	\$ 147,151	\$ 7,000	\$ 154,151	36	\$ 6,020	24	\$ 2,997	52	\$ 10,960	\$ 174,128
700.1 Develop Methodology for Establishing and Evaluating Scenarios		116	\$ 29,040	3000	\$ 32,040	12	\$ 1,980	0	\$ -	0	\$ -	\$ 34,020
700.2 Facilitate Discussions of Methodology with Stakeholders (Workshop 4)		16	\$ 3,637	1000	\$ 4,637	0	\$ -	12	\$ 1,498	0	\$ -	\$ 6,136
700.3 Develop and Evaluate Scenarios		544	\$ 102,823	1000	\$ 103,823	24	\$ 4,040	0	\$ -	52	\$ 10,960	\$ 118,824
700.4 Facilitate Discussion of Scenario Evaluation with Stakeholders (Workshops 5 and 6)		52	\$ 11,650	2000	\$ 13,650	0	\$ -	12	\$ 1,498	0	\$ -	\$ 15,149
800 Develop Supply System Road Map and Project Identification and Recommendations		366	\$ 71,936	\$ 3,000	\$ 74,936	62	\$ 10,010	12	\$ 1,498	92	\$ 20,070	\$ 106,515
800.1 Develop Supply System Road Map		220	\$ 43,440	2000	\$ 45,440	0	\$ -	0	\$ -	0	\$ -	\$ 45,440
800.2 Facilitate Discussions of Road Map with Stakeholders (Workshop 7)		24	\$ 5,611	1000	\$ 6,611	0	\$ -	12	\$ 1,498	0	\$ -	\$ 8,110
800.3 Identify and Justify Projects in Five-year Window		16	\$ 3,931	0	\$ 3,931	20	\$ 3,420	0	\$ -	0	\$ -	\$ 7,351
800.4 Estimate Cost and Schedule for Each Project		24	\$ 4,402	0	\$ 4,402	20	\$ 2,940	0	\$ -	92	\$ 20,070	\$ 27,412
800.5 Prepare TM 10.2 Summarizing Road Map and Project Recommendations		82	\$ 14,554	0	\$ 14,554	22	\$ 3,650	0	\$ -	0	\$ -	\$ 18,204
900 Prepare Final Report		236	\$ 49,298	\$ 750	\$ 50,048	64	\$ 10,160	200	\$ 18,925	22	\$ 4,863	\$ 83,997
900.1 Prepare Draft Report		156	\$31,895.9	500	\$ 32,396	36	\$ 5,740	120	\$ 11,355	22	\$ 4,863	\$ 54,354
900.2 Review Draft Report with PWB and Solicit Comment		16	\$ 3,700.7	0	\$ 3,701	10	\$ 1,550	0	\$ -	0	\$ -	\$ 5,251
900.3 Prepare Revised Draft and Final Versions of Report		64	\$13,701.5	250	\$ 13,952	18	\$ 2,870	80	\$ 7,570	0	\$ -	\$ 24,392
1000 Public Information and Stakeholder Involvement		90	\$ 18,524	\$ -	\$ 18,524	0	\$ -	207	\$ 24,555	0	\$ -	\$ 43,080
1000.1 Assist with Outreach Activities		40	\$ 7,274	0	\$ 7,274	0	\$ -	90	\$ 10,698	0	\$ -	\$ 17,972
1000.2 Coordinate and Lead Stakeholder Comment and Participation		48	\$ 10,805	0	\$ 10,805	0	\$ -	97	\$ 11,478	0	\$ -	\$ 22,283
1000.3 Prepare TM 12.1 Documenting Outreach Process and Results		2	\$ 445	0	\$ 445	0	\$ -	20	\$ 2,379	0	\$ -	\$ 2,825
TOTAL PROJECT		2,652	\$ 555,393	\$ 13,850	\$ 569,243	847	\$ 130,165	535	\$ 59,406	169	\$ 36,544	\$ 795,358

EXHIBIT B
Project: Supply System Master Plan

HOURLY RATES

Personnel		BILLING RATES			TOTAL HOURS
	Classification	Through June 2018	Through June 2019	Through June 2020	
CH2M					
Mark Anderson	Project Manager	\$219	\$224	\$228	378
Katie Bethards	Project Accountant	\$81	\$83	\$85	72
Mark Bransom	Supply Alternatives Lead	\$289	\$295	\$300	24
Ken Carlson	Watershed Management	\$237	\$242	\$247	24
Greg Gates	Plan Development Lead	\$234	\$239	\$244	548
Forrest Gist	Hazard/Risk Lead	\$276	\$282	\$287	128
Scott Haskins	Senior Strategic Advisor	\$289	\$295	\$300	12
Brittany Hughes	Project Controls	\$156	\$159	\$163	157
Tyler Jantzen	Project Engineer	\$187	\$191	\$195	188
Dale Jutila	Senior Strategic Advisor	\$238	\$243	\$247	16
Tom McLean	Senior Strategic Advisor	\$277	\$282	\$288	12
Armin Munevar	Senior Technologist	\$289	\$295	\$300	20
Lee Odell	Water Quality	\$278	\$284	\$289	112
Phil Pasteris	Climate Change Analyst	\$226	\$230	\$235	40
Brad Phelps	Senior Technologist	\$276	\$281	\$287	24
Brian Skeens	Water Demand Lead	\$221	\$225	\$229	48
Dan Speicher	Decision Science	\$277	\$282	\$288	32
Kelli Walters	Junior Project Engineer	\$112	\$114	\$116	556
Adrianne Yang	Senior Project Engineer	\$211	\$215	\$219	492
		GSI Water Solutions			
Walt Burt	Groundwater Use	\$195	\$199	\$203	137
Jeff Barry	Groundwater Use	\$235	\$240	\$244	16

John Porcello	Modeling	\$195	\$199	\$203	148
DeEtta Fosbury	Consulting Hydrogeologist	\$135	\$138	\$140	255
Mary Hingst	Project Hydrogeologist	\$115	\$117	\$120	30
Brian Anderson	Staff Hydrogeologist	\$100	\$102	\$104	110
Nicole Palmer	Graphics/GIS	\$115	\$117	\$120	42
Jill Carroll	Technical Editing	\$115	\$117	\$120	27
		JLA Public Involvement			
Jeanne Lawson	PI Strategy	\$186	\$189	\$193	29
Adrianne DeDon	Facilitation & PI Support	\$121	\$124	\$126	238
	PI Specialist, Support	\$91	\$93	\$94	132
	Admin 3	\$81	\$83	\$84	28
		Ott-Sakai & Associates			
Kevin Sakai	Principal	\$215	\$219	\$223	17
Kevin Parrish	Construction Specialist	\$215	\$219	\$223	140
Forrest Dill	Contracts Manager	\$150	\$153	\$156	12