



Gregory L. Geist
Director

Board of County Commissioners
Clackamas County

Members of the Board:

Approval of Contract between Water Environment Services and West Consultants, Inc., for the
Stream Flow and Precipitation Monitoring Project

Purpose/Outcome	Provide stream flow and rainfall monitoring services to support WES's wastewater and stormwater infrastructure planning efforts, such as facility and collection system master plans, wastewater infiltration/inflow projects, and design standards.
Dollar Amount and Fiscal Impact	Total Contract Value of \$812,220.00 until December 31, 2026.
Funding Source	25% - 639-01-431350-42100/ 60%- 641-01-431350-42100
Duration	Contract until December 31, 2026
Previous Board Action/Review	BCC Issues on February 23, 2021
Strategic Plan Alignment	<p>This project will provide data for WES's infrastructure planning efforts that support the following strategic priorities and results:</p> <p>Grow a Vibrant Economy</p> <ul style="list-style-type: none"> By 2024, 80% of businesses that pay family wage jobs seeking to locate or expand in Clackamas County will find serviceable commercial or industrial properties which meet their particular business needs. <p>Ensure Safe, Healthy, and Secure Communities</p> <ul style="list-style-type: none"> By 2025, 1,500 affordable housing units will be developed*. Those units will be stratified across Area Median Income (AMI) ranges as shown above. <p>Honor, Utilize, Promote and Invest in our Natural Resources</p> <ul style="list-style-type: none"> By January 2022, a Climate Action plan is adopted for our community with specific recommendations to reach the goal of being carbon neutral by 2050.
Counsel Review	AK 2/4/2021
Procurement Review	Was this project processed through Procurement? Yes.
Contact Person	Ron Wierenga, WES Environmental Services Manager, 503-742-4581
Contract No.	3673

BACKGROUND: WES needs precipitation and wastewater/surface water flow data for wastewater and stormwater infrastructure planning efforts, such as facility and collection system master plans, wastewater infiltration/inflow projects, and design standards. Some data is available regionally that WES can use. The majority of the data need, however, is localized, in its own wastewater/surface water system, so has to be generated. Some of this data need is met in-house using WES staff and district resources, such portions of the wastewater flow monitoring network. Other data has historically been provided through service contracts where specialized expertise is required, or staffing resources are insufficient to meet the need.

WES has monitored continuous surface water flow in streams throughout the district for over fifteen years, and currently has long-term monitoring stations on four streams in WES's service area operated by a contractor. The data is used in water quality studies and hydrologic modeling in support of regulatory requirements and watershed health planning efforts.

WES has monitored precipitation at eight gauges located throughout the service area for nearly 40 years. The precipitation data is critical in helping understand WES's operational impacts in stormwater management and wastewater flow data, and is essential for infrastructure planning efforts, such as master plans. Changes in technology, needs and uses for the data, and the growth of WES's service area require upgrading and reconfiguring the precipitation gauge network.

WES has continuous monitoring and adaptive control (CMAC) systems in three regional stormwater ponds that use National Weather Service rainfall prediction to estimate the amount of rainfall and adjust pond operations accordingly. The equipment needs ongoing maintenance in order to function properly.

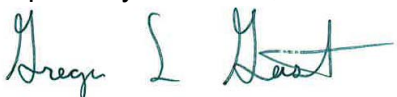
Under this five (5) year contract, the Contractor will continue the operating the stream flow monitoring sites, upgrade and operate the network of precipitation monitoring sites, and provide ongoing operation and support of the CMAC stormwater systems.

PROCUREMENT PROCESS: This project was advertised in accordance with ORS and LCRB Rules on October 28, 2020. Proposals were opened on December 1, 2020. The District received two (2) proposals: West Consultants, Inc. and Delta Operations. The Evaluation Committee selected West Consultants, Inc. as the highest ranking proposer recommended a contract be awarded.

RECOMMENDATION:

Staff recommends that the Board of County Commissioners of Clackamas County, acting as the governing body of Water Environment Services, approve and execute the Contract between Water Environment Services and West Consultants, Inc., for the stream flow and precipitation monitoring Project.

Respectfully submitted,



Greg Geist
Director, WES

Placed on the _____ Agenda by the Procurement Division.



**WATER ENVIRONMENT SERVICES
PERSONAL SERVICES CONTRACT
Contract #3673**

This Personal Services Contract (this “Contract”) is entered into between **West Consultants, Inc.** (“Contractor”), and **Water Environment Services**, a political subdivision of the State of Oregon (“District”).

ARTICLE I.

- 1. Effective Date and Duration.** This Contract shall become effective upon signature of both parties. Unless earlier terminated or extended, this Contract shall expire on **December 31, 2026**. Upon the mutual written consent of the parties, the Contract may be renewed for two (2) one (1) year renewals.
- 2. Scope of Work.** Contractor shall provide the following personal services: Stream flow and precipitation monitoring (“Work”), further described in **Exhibit A**.
- 3. Consideration.** The District agrees to pay Contractor, from available and authorized funds, a sum not to exceed **Eight Hundred Twelve Thousand Two Hundred Twenty-Two dollars (\$812,220.00)**, for accomplishing the Work required by this Contract. Consideration rates are on a time and materials basis in accordance with the rates and costs specified in **Exhibit B**. If any interim payments to Contractor are made, such payments shall be made only in accordance with the schedule and requirements in **Exhibit B**.
- 4. Invoices and Payments.** Unless otherwise specified, Contractor shall submit monthly invoices for Work performed. Invoices shall describe all Work performed with particularity, by whom it was performed, and shall itemize and explain all expenses for which reimbursement is claimed. The invoices shall include the total amount billed to date by Contractor prior to the current invoice. If Contractor fails to present invoices in proper form within sixty (60) calendar days after the end of the month in which the services were rendered, Contractor waives any rights to present such invoice thereafter and to receive payment therefor. Payments shall be made in accordance with ORS 293.462 to Contractor following the District’s review and approval of invoices submitted by Contractor. Contractor shall not submit invoices for, and the District will not be obligated to pay, any amount in excess of the maximum compensation amount set forth above. If this maximum compensation amount is increased by amendment of this Contract, the amendment must be fully effective before Contractor performs Work subject to the amendment.

Invoices shall reference the above Contract Number and be submitted to: Leah Johanson.

- 5. Travel and Other Expense.** Authorized: Yes No
If travel expense reimbursement is authorized in this Contract, such expense shall only be reimbursed at the rates in the Clackamas County Contractor Travel Reimbursement Policy, hereby incorporated by reference and found at: <https://www.clackamas.us/finance/terms.html>. Travel expense reimbursement is not in excess of the not to exceed consideration.
- 6. Contract Documents.** This Contract consists of the following documents, which are listed in descending order of precedence and are attached and incorporated by reference, this Contract, Exhibit A, and Exhibit B. Unless explicitly agreed to by the parties in the Contract, any additional terms and conditions that may be contained in Exhibit B are void.

7. Contractor and District Contacts.

Contractor	District
Administrator: Hans Hadley Phone: 503-485-5490 Email: hhadley@westconsultants.com	Administrator: Leah Johanson Phone: 503-742-4620 Email: LJohanson@clackamas.us

Payment information will be reported to the Internal Revenue Service (“IRS”) under the name and taxpayer ID number submitted. (See I.R.S. 1099 for additional instructions regarding taxpayer ID numbers.) Information not matching IRS records will subject Contractor payments to backup withholding.

ARTICLE II.

- 1. ACCESS TO RECORDS.** Contractor shall maintain books, records, documents, and other evidence, in accordance with generally accepted accounting procedures and practices, sufficient to reflect properly all costs of whatever nature claimed to have been incurred and anticipated to be incurred in the performance of this Contract. District and their duly authorized representatives shall have access to the books, documents, papers, and records of Contractor, which are directly pertinent to this Contract for the purpose of making audit, examination, excerpts, and transcripts. Contractor shall maintain such books and records for a minimum of six (6) years, or such longer period as may be required by applicable law, following final payment and termination of this Contract, or until the conclusion of any audit, controversy or litigation arising out of or related to this Contract, whichever date is later.
- 2. AVAILABILITY OF FUTURE FUNDS.** Any continuation or extension of this Contract after the end of the fiscal period in which it is written is contingent on a new appropriation for each succeeding fiscal period sufficient to continue to make payments under this Contract, as determined by the District in its sole administrative discretion.
- 3. CAPTIONS.** The captions or headings in this Contract are for convenience only and in no way define, limit, or describe the scope or intent of any provisions of this Contract.
- 4. COMPLIANCE WITH APPLICABLE LAW.** Contractor shall comply with all applicable federal, state and local laws, regulations, executive orders, and ordinances, as such may be amended from time to time.
- 5. COUNTERPARTS.** This Contract may be executed in several counterparts (electronic or otherwise), each of which shall be an original, all of which shall constitute the same instrument.
- 6. GOVERNING LAW.** This Contract, and all rights, obligations, and disputes arising out of it, shall be governed and construed in accordance with the laws of the State of Oregon and the ordinances of Clackamas County without regard to principles of conflicts of law. Any claim, action, or suit between District and Contractor that arises out of or relates to the performance of this Contract shall be brought and conducted solely and exclusively within the Circuit Court for Clackamas County, for the State of Oregon. Provided, however, that if any such claim, action, or suit may be brought in a federal forum, it shall be brought and conducted solely and exclusively within the United States District Court for the District of Oregon. In no event shall this section be construed as a waiver by the District of any form of defense or immunity, whether sovereign immunity, governmental immunity, immunity based on the Eleventh Amendment to the Constitution of the United States or otherwise, from any claim or from the jurisdiction of any court. Contractor, by execution of this Contract, hereby consents to the personal jurisdiction of the courts referenced in this section.
- 7. RESPONSIBILITY FOR DAMAGES; INDEMNITY.** Contractor shall be responsible for all damage to property, injury to persons, and loss, expense, inconvenience, and delay which may be caused by, or result from, the conduct of Work, or from any act, omission, or neglect of Contractor, its subcontractors, agents, or employees. The Contractor agrees to indemnify, hold harmless and defend Clackamas County and the District, and their officers, elected officials, agents and employees from and against all claims and actions, and all expenses incidental to the investigation and defense thereof, arising out of or based upon damage or injuries to persons or property caused by the errors, omissions, fault or negligence of the Contractor or the Contractor's employees, subcontractors, or agents. However, neither Contractor nor any attorney engaged by Contractor shall defend the claim in

the name of District or any department of District, nor purport to act as legal representative of District or any of its departments, without first receiving from the Clackamas County Counsel's Office authority to act as legal counsel for District, nor shall Contractor settle any claim on behalf of District without the approval of the Clackamas County Counsel's Office. District may, at its election and expense, assume its own defense and settlement.

- 8. INDEPENDENT CONTRACTOR STATUS.** The service(s) to be rendered under this Contract are those of an independent contractor. Although the District reserves the right to determine (and modify) the delivery schedule for the Work to be performed and to evaluate the quality of the completed performance, District cannot and will not control the means or manner of Contractor's performance. Contractor is responsible for determining the appropriate means and manner of performing the Work. Contractor is not to be considered an agent or employee of District for any purpose, including, but not limited to: (A) The Contractor will be solely responsible for payment of any Federal or State taxes required as a result of this Contract; and (B) This Contract is not intended to entitle the Contractor to any benefits generally granted to District employees, including, but not limited to, vacation, holiday and sick leave, other leaves with pay, tenure, medical and dental coverage, life and disability insurance, overtime, Social Security, Workers' Compensation, unemployment compensation, or retirement benefits.
- 9. INSURANCE.** Contractor shall secure at its own expense and keep in effect during the term of the performance under this Contract the insurance required and minimum coverage indicated below. The insurance requirements outlined below do not in any anyway limit the amount of scope of liability of Contractor under this Contract. Contractor shall provide proof of said insurance and name the District and Clackamas County as an additional insureds on all required liability policies. Proof of insurance and notice of any material change should be submitted to the following address: Clackamas County Procurement Division, 2051 Kaen Road, Oregon City, OR 97045 or procurement@clackamas.us.

Required - Workers Compensation: Contractor shall comply with the statutory workers' compensation requirements in ORS 656.017, unless exempt under ORS 656.027 or 656.126.
<input checked="" type="checkbox"/> Required – Commercial General Liability: combined single limit, or the equivalent, of not less than \$1,000,000 per claim, with an annual aggregate limit of \$2,000,000 for Bodily Injury and Property Damage.
<input checked="" type="checkbox"/> Required – Professional Liability: combined single limit, or the equivalent, of not less than \$1,000,000 per occurrence, with an annual aggregate limit of \$2,000,000 for damages caused by error, omission or negligent acts.
<input checked="" type="checkbox"/> Required – Automobile Liability: combined single limit, or the equivalent, of not less than \$1,000,000 per accident for Bodily Injury and Property Damage.

The policy(s) shall be primary insurance as respects to the District. Any insurance or self-insurance maintained by the District shall be excess and shall not contribute to it. Any obligation that District agree to a waiver of subrogation is hereby stricken.

- 10. LIMITATION OF LIABILITIES.** This Contract is expressly subject to the debt limitation of Oregon counties set forth in Article XI, Section 10, of the Oregon Constitution, and is contingent upon funds being appropriated therefore. Any provisions herein which would conflict with law are deemed inoperative to that extent. Except for liability arising under or related to Article II, Section 13 or Section 20 neither party shall be liable for (i) any indirect, incidental, consequential or special damages under this Contract or (ii) any damages of any sort arising solely from the termination of this Contact in accordance with its terms.
- 11. NOTICES.** Except as otherwise provided in this Contract, any required notices between the parties shall be given in writing by personal delivery, email, or mailing the same, to the Contract Administrators identified in Article 1, Section 6. If notice is sent to District, a copy shall also be sent to: Clackamas County Procurement, 2051 Kaen Road, Oregon City, OR 97045, or procurement@clackamas.us. Any communication or notice so addressed and mailed shall be deemed to be given five (5) days after mailing, and immediately upon personal delivery, or within 2 hours

after the email is sent during District's normal business hours (Monday – Thursday, 7:00 a.m. to 6:00 p.m.) (as recorded on the device from which the sender sent the email), unless the sender receives an automated message or other indication that the email has not been delivered.

- 12. OWNERSHIP OF WORK PRODUCT.** All work product of Contractor that results from this Contract (the “Work Product”) is the exclusive property of District. District and Contractor intend that such Work Product be deemed “work made for hire” of which District shall be deemed the author. If for any reason the Work Product is not deemed “work made for hire,” Contractor hereby irrevocably assigns to District all of its right, title, and interest in and to any and all of the Work Product, whether arising from copyright, patent, trademark or trade secret, or any other state or federal intellectual property law or doctrine. Contractor shall execute such further documents and instruments as District may reasonably request in order to fully vest such rights in District. Contractor forever waives any and all rights relating to the Work Product, including without limitation, any and all rights arising under 17 USC § 106A or any other rights of identification of authorship or rights of approval, restriction or limitation on use or subsequent modifications. Notwithstanding the above, District shall have no rights in any pre-existing Contractor intellectual property provided to District by Contractor in the performance of this Contract except to copy, use and re-use any such Contractor intellectual property for District use only.
- 13. REPRESENTATIONS AND WARRANTIES.** Contractor represents and warrants to District that (A) Contractor has the power and authority to enter into and perform this Contract; (B) this Contract, when executed and delivered, shall be a valid and binding obligation of Contractor enforceable in accordance with its terms; (C) Contractor shall at all times during the term of this Contract, be qualified, professionally competent, and duly licensed to perform the Work; (D) Contractor is an independent contractor as defined in ORS 670.600; and (E) the Work under this Contract shall be performed in a good and workmanlike manner and in accordance with the highest professional standards. The warranties set forth in this section are in addition to, and not in lieu of, any other warranties provided. The Contractor shall be responsible for the technical accuracy of its services and documents resulting therefrom, and District shall not be responsible for discovering deficiencies therein. The Contractor shall correct such deficiencies without additional compensation except to the extent such action is directly attributable to deficiencies in information furnished by the District.
- 14. SURVIVAL.** All rights and obligations shall cease upon termination or expiration of this Contract, except for the rights and obligations set forth in Article II, Sections 1, 6, 7, 11, 13, 14, 16, 21 and 27, and all other rights and obligations which by their context are intended to survive. However, such expiration shall not extinguish or prejudice the District's right to enforce this Contract with respect to: (a) any breach of a Contractor warranty; or (b) any default or defect in Contractor performance that has not been cured.
- 15. SEVERABILITY.** 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.
- 16. SUBCONTRACTS AND ASSIGNMENTS.** Contractor shall not enter into any subcontracts for any of the Work required by this Contract, or assign or transfer any of its interest in this Contract by operation of law or otherwise, without obtaining prior written approval from the District, which shall be granted or denied in the District's sole discretion. In addition to any provisions the District may require, Contractor shall include in any permitted subcontract under this Contract a requirement that the subcontractor be bound by this Article II, Sections 1, 7, 8, 13, 16, and 27 as if the subcontractor were the Contractor. District's consent to any subcontract shall not relieve Contractor of any of its duties or obligations under this Contract.
- 17. 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 authorized successors and assigns.

- 18. TAX COMPLIANCE CERTIFICATION.** The Contractor shall comply with all federal, state and local laws, regulation, executive orders and ordinances applicable to this Contract. Contractor represents and warrants that it has complied, and will continue to comply throughout the duration of this Contract and any extensions, with all tax laws of this state or any political subdivision of this state, including but not limited to ORS 305.620 and ORS chapters 316, 317, and 318. Any violation of this section shall constitute a material breach of this Contract and shall entitle District to terminate this Contract, to pursue and recover any and all damages that arise from the breach and the termination of this Contract, and to pursue any or all of the remedies available under this Contract or applicable law.
- 19. TERMINATIONS.** This Contract may be terminated for the following reasons: (A) by mutual agreement of the parties or by the District (i) for convenience upon thirty (30) days written notice to Contractor, or (ii) at any time the District fails to receive funding, appropriations, or other expenditure authority as solely determined by the District; or (B) if contractor breaches any Contract provision or is declared insolvent, District may terminate after thirty (30) days written notice with an opportunity to cure.
- Upon receipt of written notice of termination from the District, Contractor shall immediately stop performance of the Work. Upon termination of this Contract, Contractor shall deliver to District all documents, Work Product, information, works-in-progress and other property that are or would be deliverables had the Contract Work been completed. Upon District's request, Contractor shall surrender to anyone District designates, all documents, research, objects or other tangible things needed to complete the Work
- 20. REMEDIES.** If terminated by the District due to a breach by the Contractor, then the District shall have any remedy available to it in law or equity. If this Contract is terminated for any other reason, Contractor's sole remedy is payment for the goods and services delivered and accepted by the District, less any setoff to which the District is entitled.
- 21. NO THIRD PARTY BENEFICIARIES.** District and Contractor are the only parties to this Contract and are the only parties entitled to enforce its terms. Nothing in this Contract gives, is intended to give, or shall be construed to give or provide any benefit or right, whether directly, indirectly or otherwise, to third persons unless such third persons are individually identified by name herein and expressly described as intended beneficiaries of the terms of this Contract.
- 22. TIME IS OF THE ESSENCE.** Contractor agrees that time is of the essence in the performance this Contract.
- 23. FOREIGN CONTRACTOR.** If the Contractor is not domiciled in or registered to do business in the State of Oregon, Contractor shall promptly provide to the Oregon Department of Revenue and the Secretary of State, Corporate Division, all information required by those agencies relative to this Contract. The Contractor shall demonstrate its legal capacity to perform these services in the State of Oregon prior to entering into this Contract.
- 24. FORCE MAJEURE.** Neither District nor Contractor shall be held responsible for delay or default caused by events outside the District or Contractor's reasonable control including, but not limited to, fire, terrorism, riot, acts of God, or war. However, Contractor shall make all reasonable efforts to remove or eliminate such a cause of delay or default and shall upon the cessation of the cause, diligently pursue performance of its obligations under this Contract.
- 25. WAIVER.** The failure of District to enforce any provision of this Contract shall not constitute a waiver by District of that or any other provision.
- 26. PUBLIC CONTRACTING REQUIREMENTS.** Pursuant to the public contracting requirements contained in Oregon Revised Statutes ("ORS") Chapter 279B.220 through 279B.235, Contractor shall:

- a. Make payments promptly, as due, to all persons supplying to Contractor labor or materials for the prosecution of the work provided for in the Contract.
- b. Pay all contributions or amounts due the Industrial Accident Fund from such Contractor or subcontractor incurred in the performance of the Contract.
- c. Not permit any lien or claim to be filed or prosecuted against District on account of any labor or material furnished.
- d. Pay the Department of Revenue all sums withheld from employees pursuant to ORS 316.167.
- e. As applicable, the Contractor shall pay employees for work in accordance with ORS 279B.235, which is incorporated herein by this reference. The Contractor shall comply with the prohibitions set forth in ORS 652.220, compliance of which is a material element of this Contract, and failure to comply is a breach entitling District to terminate this Contract for cause.
- f. If the Work involves lawn and landscape maintenance, Contractor shall salvage, recycle, compost, or mulch yard waste material at an approved site, if feasible and cost effective.


27. **NO ATTORNEY FEES.** In the event any arbitration, action or proceeding, including any bankruptcy proceeding, is instituted to enforce any term of this Contract, each party shall be responsible for its own attorneys' fees and expenses.

28. **MERGER.** THIS CONTRACT CONSTITUTES THE ENTIRE AGREEMENT BETWEEN THE PARTIES WITH RESPECT TO THE SUBJECT MATTER REFERENCED THEREIN. THERE ARE NO UNDERSTANDINGS, AGREEMENTS, OR REPRESENTATIONS, ORAL OR WRITTEN, NOT SPECIFIED HEREIN REGARDING THIS CONTRACT. NO AMENDMENT, CONSENT, OR WAIVER OF TERMS OF THIS CONTRACT SHALL BIND EITHER PARTY UNLESS IN WRITING AND SIGNED BY ALL PARTIES. ANY SUCH AMENDMENT, CONSENT, OR WAIVER SHALL BE EFFECTIVE ONLY IN THE SPECIFIC INSTANCE AND FOR THE SPECIFIC PURPOSE GIVEN. CONTRACTOR, BY THE SIGNATURE HERETO OF ITS AUTHORIZED REPRESENTATIVE, IS AN INDEPENDENT CONTRACTOR, ACKNOWLEDGES HAVING READ AND UNDERSTOOD THIS CONTRACT, AND CONTRACTOR AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS.

By their signatures below, the parties to this Contract agree to the terms, conditions, and content expressed herein.

West Consultants, Inc.

Water Environment Services

 2/4/2021
 Authorized Signature Date

 Chair Date

Hans Hatley / Vice President
 Name / Title (Printed)

 Recording Secretary

247729-80
 Oregon Business Registry #

Approved as to Form:

FBC/California
 Entity Type / State of Formation

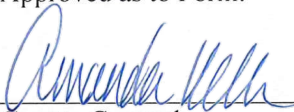
 2/12/21
 County Counsel Date

EXHIBIT A
RFP #2020-89
STREAM FLOW AND PRECIPITATION MONITORING
Published October 28, 2020



REQUEST FOR PROPOSALS #2020-89

FOR

Stream Flow and Precipitation Monitoring

BOARD OF COUNTY COMMISSIONERS

JIM BERNARD, Chair

SONYA FISCHER, Commissioner

KEN HUMBERSTON, Commissioner

PAUL SAVAS, Commissioner

MARTHA SCHRADER, Commissioner

**Gary Schmidt
County Administrator**

**George Marlton
County Procurement Officer**

**Tralee Whitley
Analyst**

PROPOSAL CLOSING DATE, TIME AND LOCATION

DATE: December 1, 2020

TIME: 2:00 PM, Pacific Time

**PLACE: Clackamas County Procurement Division
Clackamas County Public Services Building
2051 Kaen Road, Oregon City, OR 97045**

SCHEDULE

Request for Proposals Issued.....	October 28, 2020
Protest of Specifications Deadline.....	November 4, 2020, 5:00 PM, Pacific Time
Deadline to Submit Clarifying Questions.....	November 24, 2020, 5:00 PM, Pacific Time
Request for Proposals Closing Date and Time.....	December 1, 2020, 2:00 PM, Pacific Time
Deadline to Submit Protest of Award.....	Seven (7) days from the Intent to Award
Anticipated Contract Start Date.....	January 2021

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SECTION 1
NOTICE OF REQUEST FOR PROPOSALS

Notice is hereby given that Water Environment Services (“WES”) through its Board of County Commissioners will receive sealed Proposals per specifications until **2:00 PM, December 1, 2020** (“Closing”), to provide Stream Flow and Precipitation Monitoring. No Proposals will be received or considered after that time.

The resulting contract from this RFP require the consultant to begin work in January 2021 with work set to continue through December 2026.

RFP Documents can be downloaded from ORPIN at the following address:

<http://orpin.oregon.gov/open.dll/welcome>, Document No. C01010-2020-89-20.

Prospective Proposers will need to sign in to download the information and that information will be accumulated for a Plan Holder's List. Prospective Proposers are responsible for obtaining any Addenda, clarifying questions, and Notices of Award from ORPIN. Sealed Proposals are to be sent to Clackamas County Procurement Services – Attention George Marlton, Chief Procurement Officer at 2051 Kaen Road, Oregon City, Oregon, 97045 or may be emailed to procurement@clackamas.us.

Contact Information

Procurement Process and Technical Questions: Tralee Whitley, twhitley@clackamas.us

The Board of County Commissioners reserves the right to reject any and all Proposals not in compliance with all prescribed public bidding procedures and requirements, and may reject for good cause any and all Proposals upon the finding that it is in the public interest to do so and to waive any and all informalities in the public interest. In the award of the contract, the Board of County Commissioners will consider the element of time, will accept the Proposal or Proposals which in their estimation will best serve the interests of Clackamas County and will reserve the right to award the contract to the contractor whose Proposal shall be best for the public good.

Clackamas County encourages proposals from Minority, Women, and Emerging Small Businesses.

SECTION 2 INSTRUCTIONS TO PROPOSERS

Clackamas County (“County”) reserves the right to reject any and all Proposals received as a result of this RFP. County Local Contract Review Board Rules (“LCRB”) govern the procurement process for the County.

2.1 Modification or Withdrawal of Proposal: Any Proposal may be modified or withdrawn at any time prior to the Closing deadline, provided that a written request is received by the County Procurement Division Director, prior to the Closing. The withdrawal of a Proposal will not prejudice the right of a Proposer to submit a new Proposal.

2.2 Requests for Clarification and Requests for Change: Proposers may submit questions regarding the specifications of the RFP. Questions must be received in writing on or before 5:00 p.m. (Pacific Time), on the date indicated in the Schedule, at the Procurement Division address as listed in Section 1 of this RFP. Requests for changes must include the reason for the change and any proposed changes to the requirements. The purpose of this requirement is to permit County to correct, prior to the opening of Proposals, RFP terms or technical requirements that may be unlawful, improvident or which unjustifiably restrict competition. County will consider all requested changes and, if appropriate, amend the RFP. No oral or written instructions or information concerning this RFP from County managers, employees or agents to prospective Proposers shall bind County unless included in an Addendum to the RFP.

2.3 Protests of the RFP/Specifications: Protests must be in accordance with LCRB C-047-0730. Protests of Specifications must be received in writing on or before 5:00 p.m. (Pacific Time), on the date indicated in the Schedule, or within three (3) business days of issuance of any addendum, at the Procurement Division address listed in Section 1 of this RFP. Protests may not be faxed. Protests of the RFP specifications must include the reason for the protest and any proposed changes to the requirements.

2.4 Addenda: If any part of this RFP is changed, an addendum will be provided to Proposers that have provided an address to the Procurement Division for this procurement. It shall be Proposers responsibility to regularly check ORPIN for any notices, published addenda, or response to clarifying questions.

2.5 Submission of Proposals: Proposals must be submitted in accordance with Section 5. All Proposals shall be legibly written in ink or typed and comply in all regards with the requirements of this RFP. Proposals that include orders or qualifications may be rejected as irregular. All Proposals must include a signature that affirms the Proposer’s intent to be bound by the Proposal (may be on cover letter, on the Proposal, or the Proposal Certification Form) shall be signed. If a Proposal is submitted by a firm or partnership, the name and address of the firm or partnership shall be shown, together with the names and addresses of the members. If the Proposal is submitted by a corporation, it shall be signed in the name of such corporation by an official who is authorized to bind the contractor. The Proposals will be considered by the County to be submitted in confidence and are not subject to public disclosure until the notice of intent to award has been issued.

No late Proposals will be accepted. Proposals submitted after the Closing will be considered late and will be returned unopened. Proposals may not be submitted by telephone or fax.

2.6 Post-Selection Review and Protest of Award: County will name the apparent successful Proposer in a Notice of Intent to Award published on ORPIN. Identification of the apparent successful Proposer is procedural only and creates no right of the named Proposer to award of the contract. Competing Proposers shall be given seven (7) calendar days from the date on the Notice of Intent to Award to review the file at the Procurement Division office and file a written protest of award, pursuant to LCRB C-047-0740. Any award protest must be in writing and must be delivered by hand-delivery or mail to the address for the Procurement Division as listed in Section 1 of this RFP.

Only actual Proposers may protest if they believe they have been adversely affected because the Proposer would be eligible to be awarded the contract in the event the protest is successful. The basis of the written protest must

be in accordance with ORS 279B.410 and shall specify the grounds upon which the protest is based. In order to be an adversely affected Proposer with a right to submit a written protest, a Proposer must be next in line for award, i.e. the protester must claim that all higher rated Proposers are ineligible for award because they are non-responsive or non-responsible.

County will consider any protests received and:

- a. reject all protests and proceed with final evaluation of, and any allowed contract language negotiation with, the apparent successful Proposer and, pending the satisfactory outcome of this final evaluation and negotiation, enter into a contract with the named Proposer; OR
- b. sustain a meritorious protest(s) and reject the apparent successful Proposer as nonresponsive, if such Proposer is unable to demonstrate that its Proposal complied with all material requirements of the solicitation and Oregon public procurement law; thereafter, County may name a new apparent successful Proposer; OR
- c. reject all Proposals and cancel the procurement.

2.7 Acceptance of Contractual Requirements: Failure of the selected Proposer to execute a contract and deliver required insurance certificates within ten (10) calendar days after notification of an award may result in cancellation of the award. This time period may be extended at the option of County.

2.8 Public Records: Proposals are deemed confidential until the “Notice of Intent to Award” letter is issued. This RFP and one copy of each original Proposal received in response to it, together with copies of all documents pertaining to the award of a contract, will be kept and made a part of a file or record which will be open to public inspection. If a Proposal contains any information that is considered a **TRADE SECRET** under ORS 192.345(2), **SUCH INFORMATION MUST BE LISTED ON A SEPARATE SHEET CAPABLE OF SEPARATION FROM THE REMAINING PROPOSAL AND MUST BE CLEARLY MARKED WITH THE FOLLOWING LEGEND:**

“This information constitutes a trade secret under ORS 192.345(2), and shall not be disclosed except in accordance with the Oregon Public Records Law, ORS Chapter 192.”

The Oregon Public Records Law exempts from disclosure only bona fide trade secrets, and the exemption from disclosure applies only “unless the public interest requires disclosure in the particular instance” (ORS 192.345). Therefore, non-disclosure of documents, or any portion of a document submitted as part of a Proposal, may depend upon official or judicial determinations made pursuant to the Public Records Law.

2.9 Investigation of References: County reserves the right to investigate all references in addition to those supplied references and investigate past performance of any Proposer with respect to its successful performance of similar services, its compliance with specifications and contractual obligations, its completion or delivery of a project on schedule, its lawful payment of subcontractors and workers, and any other factor relevant to this RFP. County may postpone the award or the execution of the contract after the announcement of the apparent successful Proposer in order to complete its investigation.

2.10 RFP Proposal Preparation Costs and Other Costs: Proposer costs of developing the Proposal, cost of attendance at an interview (if requested by County), or any other costs are entirely the responsibility of the Proposer, and will not be reimbursed in any manner by County.

2.11 Clarification and Clarity: County reserves the right to seek clarification of each Proposal, or to make an award without further discussion of Proposals received. Therefore, it is important that each Proposal be submitted initially in the most complete, clear, and favorable manner possible.

2.12 Right to Reject Proposals: County reserves the right to reject any or all Proposals or to withdraw any item from the award, if such rejection or withdrawal would be in the public interest, as determined by County.

2.13 Cancellation: County reserves the right to cancel or postpone this RFP at any time or to award no contract.

2.14 Proposal Terms: All Proposals, including any price quotations, will be valid and firm through a period of one hundred and eighty (180) calendar days following the Closing date. County may require an extension of this firm offer period. Proposers will be required to agree to the longer time frame in order to be further considered in the procurement process.

2.15 Oral Presentations: At County's sole option, Proposers may be required to give an oral presentation of their Proposals to County, a process which would provide an opportunity for the Proposer to clarify or elaborate on the Proposal but will in no material way change Proposer's original Proposal. If the evaluating committee requests presentations, the Procurement Division will schedule the time and location for said presentation. Any costs of participating in such presentations will be borne solely by Proposer and will not be reimbursed by County. **Note:** Oral presentations are at the discretion of the evaluating committee and may not be conducted; therefore, **written Proposals should be complete.**

2.16 Usage: It is the intention of County to utilize the services of the successful Proposer(s) to provide services as outlined in the below Scope of Work.

2.17 Review for Responsiveness: Upon receipt of all Proposals, the Procurement Division or designee will determine the responsiveness of all Proposals before submitting them to the evaluation committee. If a Proposal is incomplete or non-responsive in significant part or in whole, it will be rejected and will not be submitted to the evaluation committee. County reserves the right to determine if an inadvertent error is solely clerical or is a minor informality which may be waived, and then to determine if an error is grounds for disqualifying a Proposal. The Proposer's contact person identified on the Proposal will be notified, identifying the reason(s) the Proposal is non-responsive. One copy of the Proposal will be archived and all others discarded.

2.18 RFP Incorporated into Contract: This RFP will become part of the Contract between County and the selected contractor(s). The contractor(s) will be bound to perform according to the terms of this RFP, their Proposal(s), and the terms of the Sample Contract.

2.19 Communication Blackout Period: Except as called for in this RFP, Proposers may not communicate with members of the Evaluation Committee or other County employees or representatives about the RFP during the procurement process until the apparent successful Proposer is selected, and all protests, if any, have been resolved. Communication in violation of this restriction may result in rejection of a Proposer.

2.20 Prohibition on Commissions and Subcontractors: County will contract directly with persons/entities capable of performing the requirements of this RFP. Contractors must be represented directly. Participation by brokers or commissioned agents will not be allowed during the Proposal process. Contractor shall not use subcontractors to perform the Work unless specifically pre-authorized in writing to do so by the County. Contractor represents that any employees assigned to perform the Work, and any authorized subcontractors performing the Work, are fully qualified to perform the tasks assigned to them, and shall perform the Work in a competent and professional manner. Contractor shall not be permitted to add on any fee or charge for subcontractor Work. Contractor shall provide, if requested, any documents relating to subcontractor's qualifications to perform required Work.

2.21 Ownership of Proposals: All Proposals in response to this RFP are the sole property of County, and subject to the provisions of ORS 192.410-192.505 (Public Records Act).

2.22 Clerical Errors in Awards: County reserves the right to correct inaccurate awards resulting from its clerical errors.

2.23 Rejection of Qualified Proposals: Proposals may be rejected in whole or in part if they attempt to limit or modify any of the terms, conditions, or specifications of the RFP or the Sample Contract.

2.24 Collusion: By responding, the Proposer states that the Proposal is not made in connection with any competing Proposer submitting a separate response to the RFP, and is in all aspects fair and without collusion or fraud. Proposer also certifies that no officer, agent, elected official, or employee of County has a pecuniary interest in this Proposal.

2.25 Evaluation Committee: Proposals will be evaluated by a committee consisting of representatives from County and potentially external representatives. County reserves the right to modify the Evaluation Committee make-up in its sole discretion.

2.26 Commencement of Work: The contractor shall commence no work until all insurance requirements have been met, the Protest of Awards deadline has been passed, any protest have been decided, a contract has been fully executed, and a Notice to Proceed has been issued by County.

2.27 Nondiscrimination: The successful Proposer agrees that, in performing the work called for by this RFP and in securing and supplying materials, contractor will not discriminate against any person on the basis of race, color, religious creed, political ideas, sex, age, marital status, sexual orientation, gender identity, veteran status, physical or mental handicap, national origin or ancestry, or any other class protected by applicable law.

SECTION 3 SCOPE OF WORK

3.1. INTRODUCTION

Clackamas Water Environment Services (“WES”), referred to as “District”, is seeking Proposals from consultants to provide services to provide comprehensive stream flow and precipitation monitoring services and operation and maintenance of three stormwater continuous monitoring and adaptive control systems (“Opti CMAC”).

Please direct all Technical/Specifications or Procurement Process Questions to the indicated representative referenced in the Notice of Request for Proposals and note the communication restriction outlined in Section 2.19.

3.2 BACKGROUND

Stream Flow Monitoring: WES has monitored continuous open-channel surface flow throughout the District for over fifteen years. The data is used in water quality studies and hydrologic modeling in support of regulatory requirements and watershed health assessments. Based on recommendations from a 2012 assessment of historical gaging stations and data, WES modified the flow monitoring program and is currently collecting continuous flow monitoring data from the following locations:

- Kellogg Creek at Rowe Middle School
- Mt. Scott Creek at Hwy 224
- Phillips Creek above Sunnybrook Blvd
- Rock Creek above Hwy 212

Precipitation Monitoring: WES has a number of precipitation gauges located throughout the service area, including:

- Willamette Pump Station
- Happy Valley Regional Pond
- Carver Pump Station
- Boring WRRF
- Hoodland WRRF
- Tri-City Treatment Plant
- Kellogg WRRF
- Kellogg at Rowe Middle School

Changes in technology, needs and uses for the data, and the growth of WES’s service area have created the need to upgrade the precipitation gauge network. The existing rain gauge network has evolved over nearly 40 years. Based on recommendations from a 2019 assessment, WES has identified upgrades for existing sites and new sites for precipitation gauge installations. Specifically, the existing network of locations needs to be updated to industry best-practices and guidance from The National Oceanic and Atmospheric Administration (“NOAA”) National Weather Service on ideal spacing and site installation. The goal is to collect a continuous record of accurate, high quality, and reliable precipitation data on a daily basis. The precipitation data is critical in helping understand WES’s operational impacts in stormwater management and sanitary sewer flow data, as well as developing a long-term meteorological record in the area for the purpose of establishing a climatology for future flow, climate, and hydrologic modeling efforts.

Opti CMAC System: In 2017, WES installed the Opti continuous monitoring and adaptive control (CMAC) system in 3 detention ponds. Opti is a smart technology that uses the National Weather Service (NWS) rainfall prediction to estimate the amount of rainfall and response accordingly. The Opti system adjusts the orifice in the ponds to handle a certain amount of rainfall and store it rather than letting it drain straight through. Each Opti site has an OptiNimbus panel that controls an adjustable orifice that is connected to NWS to determine the amount of rainfall and its probability.

WES is seeking a qualified contractor to continue the flow monitoring operation and maintenance, implement the recommended changes to the precipitation monitoring, and complete the on-going operation and maintenance of the Opti system as described in the scope of work.

3.3. SCOPE OF WORK

3.3.1. Scope:

Anticipated services under this contract include:

Task 1: Streamflow Monitoring

- 1. Stream gage operation and maintenance:** Use standard United States Geological Survey (“USGS”) field operation and maintenance procedures for on-going operation and maintenance of all stream gaging stations, including routine site visits, discharge measurement calculations, and rating curve development.
- 2. Process and compute stage and discharge data:** Use standard USGS procedures to compute stage and discharge records at the stream gages and use these ratings to compute streamflow.
- 3. Data analysis and reporting:** Provide quality control review and adjustment, calculate data, and prepare tables of 15-minute discharge, mean daily discharge, discharge measurement summaries, and level summaries. Use of USGS format is preferred.
- 4. Stream gage installation and relocation:** Based on previous stream monitoring analysis and recommendations, this effort may include the installation of new/more reliable stream gages, relocation of existing gages, or installation of rain gages. Repair and/or replacement of equipment at existing gaging stations, as necessary due to failure or vandalism.

Deliverables: All data will be delivered to WES in Excel tables or other format compatible with existing data. All data will be regularly uploaded to a specified network location, FTP site, or another Clackamas County Technology Service’s provided alternative. Data shall be uploaded as a CSV file, less than 4MB in size, at the scheduled frequency established by WES.

Provide an annual summary of stream gage maintenance performed and annual summary of Quality Assurance/ Quality Control (“QA/QC”) performed consistent with USGS procedures.

Task 2: Precipitation Network

WES has a number of precipitation gauges located throughout the service area. A number of existing sites have been discontinued because they are not set up according to NOAA recommendations, some existing equipment is out dated, gauges are not spatially distributed appropriately to reflect variability, and no QA/QC of the data has been performed to confirm that data collected is meets NOAA standards. Discontinuing unnecessary gauges, upgrading equipment, and performing regular QA/QC will ensure that high quality, defensible data is collected for use by WES.

With the goal of collecting data that meets NOAA recommendations, WES is seeking a consultant to assist with operations and development of a high quality long-term record at the following sites:

- 1. Willamette Pump Station/Blue Heron**
 - a. *Current Equipment:* Tipping bucket precipitation gauge. Data logger unknown. Mounted to the side of the pump station very near the roof and subject to erroneous readings from roof splash and turbulent wind effects.
 - b. *Required Upgrade:* A new precipitation gauge and air temperature sensor that will meet NOAA exposure recommendations. Install with telemetry to make data available in near real time.
- 2. Happy Valley Regional Pond**
 - a. *Current Equipment:* Davis 7857 tipping bucket precipitation gauge mounted on 3" pipe approximately 4-5 ft above ground. The sensor is connected to an Opti control panel and OptiThunder telemetry.
 - b. *Required Upgrade:* No new equipment needed. Routine maintenance of precipitation gauge per Opti O&M recommendations.
- 3. Carver Pump Station**
 - a. *Current Equipment:* None
 - b. *Required Upgrade:* Installation of new precipitation gauge and air temperature sensor on a pipe near the building that will meet NOAA exposure recommendations. The pipe will be attached to the existing chain-link fence to prevent digging in the ground near the high voltage equipment. The site will also be installed with telemetry to make data available in near real time.
- 4. Boring Water Resource Recovery Facility (WRRF)**
 - a. *Current Equipment:* None.
 - b. *Required Upgrade:* A new, heated precipitation gauge and air temperature sensor installed on a pipe mounted to the concrete vault. The site will also be installed with telemetry to make data available in near real time. WES will provide an AC power outlet at this location.
- 5. Hoodland WRRF**
 - a. *Current Equipment:* Volumetric rain gauge with manual readings.
 - b. *Required Upgrade:* A new, heated precipitation gauge and air temperature sensor will be installed on a pipe mounted to the concrete vault. NOAA recommended exposure is impacted by tall fir trees surrounding the property. The site will also be installed with telemetry to make data available in near real time. WES will provide an AC power outlet at this location.
- 6. Tri-City WRRF**
 - a. *Current Equipment:* Global Water tipping bucket rain gage, wind speed and direction, air temperature, humidity and barometric pressure sensors connected to a Siemens ET200S Remote Base Controller and interfaced directly with Siemens S7-400 Programmable Logic Controller (PLC).
 - b. *Required Upgrade:* A new precipitation gauge and meteorological sensors (wind speed and direction, barometric pressure, relative humidity and air temperature) will be installed on a pipe mounted in the ground near the southwest corner of the property. This location will meet NOAA exposure requirements and will provide convenient access to maintain all sensors. The site will also be installed with telemetry to make data available in near real time. The existing equipment will be left in place for operators to use with the PLC.
- 7. Kellogg Creek WRRF**
 - a. *Current Equipment:* Global Water tipping bucket rain gage, wind speed and direction, air temperature, humidity and barometric pressure sensors connected to a Siemens ET200S

Remote Base Controller and interfaced directly with Siemens S7-400 Programmable Logic Controller (PLC).

- b. *Required Upgrade:* A new precipitation gauge and meteorological sensors (wind speed and direction, barometric pressure, relative humidity and air temperature) will be installed on a pipe mounted in the ground in between the two clarifiers in the northwest corner of the property. This location will meet NOAA exposure requirements and will provide convenient access to maintain all sensors. The site will also be installed with telemetry to make data available in near real time. The existing equipment will be left in place for operators to use with the PLC.

8. Kellogg at Rowe Middle School

- a. *Current Equipment:* Hydrological Services TB3 Tipping Bucket with Waterlog 522+ data logger and GOES radio.
- b. *Required Upgrade:* None.

Deliverables: All data will be delivered to WES in Excel tables or other format compatible with existing data. All data will be regularly uploaded to a specified network location, FTP site, or another Clackamas County Technology Service's provided alternative. Data shall be uploaded as a CSV file, less than 4MB in size, at the scheduled frequency established by WES.

Provide an annual summary of precipitation gage maintenance performed and an annual summary of QA/QC performed consistent with NOAA recommendations/standards.

Task 3: Opti System

1. **Update/Modify Systems:** WES has experienced chronic issues with the Opti systems located in Happy Valley Regional Pond A and Happy Valley Regional Pond B. This task will include coordinating with WES and Opti to troubleshoot the Opti systems and make necessary modifications to fix errors and improve performance. WES anticipates HV Regional Pond A will need a new level sensor and new location for the sensor.
2. **System operation and maintenance:** Implement the operation and maintenance manual provided by Opti, and included in Appendix A. Includes on-going operation and maintenance of all Opti sites, including routine site visits, routine maintenance and corrective maintenance as needed. Routine maintenance includes quarterly inspection of all systems.

Deliverables: Quarterly summary of routine and corrective maintenance activities performed at each site.

The following items are included and incorporated within this RFP:

1. Opti O&M Manual (Attachment A)
2. 2012 Flow Monitoring Assessment (CDM) (Attachment B)

3.3.2. Term of Contract:

The term of the contract shall be from the effective date through **December 31, 2026**, with the option for two (2) additional one (1) year renewals thereafter subject to the mutual agreement of the parties.

3.3.3 Sample Contract: Submission of a Proposal in response to this RFP indicates Proposer's willingness to enter into a contract containing substantially the same terms (including insurance requirements) of the sample contract identified below. No action or response to the sample contract is required under this RFP. Any objections to the sample contract terms should be raised in accordance with Paragraphs 2.2 or 2.3 of this RFP, pertaining to requests for clarification or change or protest of the RFP/specifications, and as otherwise provided for in this RFP. This RFP and all supplemental information in response to this RFP will be a binding part of the final contract.

The applicable Sample Personal Services Contract, for this RFP can be found at <https://www.clackamas.us/finance/terms.html>.

Personal Services Contract (unless checked, item does not apply)

The following paragraphs of the Professional Services Contract will be applicable:

- Article I, Paragraph 5 – Travel and Other Expense is Authorized
- Article II, Paragraph 27 – Confidentiality
- Article II, Paragraph 28 – Criminal Background Check Requirements
- Article II, Paragraph 29 – Key Persons
- Exhibit A – On-Call Provision

The following insurance requirements will be applicable:

- Commercial General Liability: combined single limit, or the equivalent, of not less than \$1,000,000 per occurrence, with an annual aggregate limit of \$2,000,000 for Bodily Injury and Property Damage.
- Professional Liability: combined single limit, or the equivalent, of not less than \$1,000,000 per occurrence, with an annual aggregate limit of \$2,000,000 for damages caused by error, omission or negligent acts.
- Automobile Liability: combined single limit, or the equivalent, of not less than \$1,000,000 per occurrence for Bodily Injury and Property Damage.

**SECTION 4
EVALUATION PROCEDURE**

4.1 An evaluation committee will review all Proposals that are initially deemed responsive and they shall rank the Proposals in accordance with the below criteria. The evaluation committee may recommend an award based solely on the written responses or may request Proposal interviews/presentations. Interviews/presentations, if deemed beneficial by the evaluation committee, will consist of the highest scoring Proposers. The invited Proposers will be notified of the time, place, and format of the interview/presentation. Based on the interview/presentation, the evaluation committee may revise their scoring.

Written Proposals must be complete and no additions, deletions, or substitutions will be permitted during the interview/presentation (if any). The evaluation committee will recommend award of a contract to the final County decision maker based on the highest scoring Proposal. The County decision maker reserves the right to accept the recommendation, award to a different Proposer, or reject all Proposals and cancel the RFP.

Proposers are not permitted to directly communicate with any member of the evaluation committee during the evaluation process. All communication will be facilitated through the Procurement representative.

4.2 Evaluation Criteria

<u>Category</u>	<u>Points available:</u>
Project Understanding and Approach	0-40
Qualifications, Experience, and Organization	0-30
Project Management	0-10
Quality Assurance/Quality Control Plan	0-10
Fees	0-10
Available points	0-100

4.3 Once a selection has been made, the County will enter into contract negotiations. During negotiation, the County may require any additional information it deems necessary to clarify the approach and understanding of the requested services. Any changes agreed upon during contract negotiations will become part of the final contract. The negotiations will identify a level of work and associated fee that best represents the efforts required. If the County is unable to come to terms with the highest scoring Proposer, discussions shall be terminated and negotiations will begin with the next highest scoring Proposer. If the resulting contract contemplates multiple phases and the County deems it is in its interest to not authorize any particular phase, it reserves the right to return to this solicitation and commence negotiations with the next highest ranked Proposer to complete the remaining phases.

SECTION 5 PROPOSAL CONTENTS

5.1. Vendors must observe submission instructions and be advised as follows:

5.1.1. Complete Proposals may be mailed to the below address or emailed to Procurement@clackamas.us. The subject line of the email must identify the RFP title. Proposers are encouraged to contact Procurement to confirm receipt of the Proposal. If the Proposal is mailed, an original copy and an electronic copy (on compact disk or jump drive) must be included. The Proposal (hardcopy or email) must be received by the Closing Date and time indicated in Section 1 of the RFP.

5.1.2. Mailing address including Hand Delivery, UPS and FEDEX:

Clackamas County Procurement Division – Attention George Marlton, County Procurement Officer
Clackamas County Public Services Building
2051 Kaen Road
Oregon City, OR 97045

5.1.3. County reserves the right to solicit additional information or Proposal clarification from the vendors, or any one vendor, should the County deem such information necessary.

5.1.4. Proposal may not exceed a total of **20 pages** (single-sided), inclusive of all exhibits, attachments or other information.

Provide the following information in the order in which it appears below:

The response to this RFP shall include the following information. Respondents should provide complete and current information for all categories.

5.2 Project Understanding and Approach (40 Points): Provide a concise statement of the project teams' understanding of the project. Identify key issues that you feel are important to this project. Describe how the project team would approach this project. Describe data delivery methods and options.

5.3 Qualifications, Experience, and Organization (30 Points): Describe the specific role each key person will assume on the proposed project team. Identify the Project Manager and highlight specifically why they were selected for this role. Provide a description or graphic that show how these staff will be organized. Include specific recent experience and qualifications for these individuals. Identify the location of the office of the lead firm in which the professional services will be performed. If sub-consultants or joint venture partners are proposed as part of the team, state the reason for their involvement. Provide resumes (maximum 2 pages) for each key staff member. Provide professional registration number and state of registration (if applicable). Identify the firm's (including partners and sub-consultants) accomplishments in similar projects. List similar projects performed by key staff before other projects. List similar projects completed by the lead firm in the last five years. Include a contact name, phone number, and address for each project.

5.4 Project Management (10 Points): Describe the project management methods that will be used to control the consultant's cost and schedule. Indicate methods for liaison and communications with WES and for progress reporting.

5.5 Quality Assurance/Quality Control Plan (10 Points): The consultant shall describe the project team's proposed plan to ensure Quality Assurance/Quality Control (QA/QC) for this project. Identify the key

personnel responsible for QA/QC for each deliverable. Identify specific recommendations, standards, or practices to implement the QA/QC.

5.6 Fees (10 Points):

Provide a detailed budget of anticipated costs for the proposed Scope of Work as described in Section 3. Fees will be on a time and material basis demonstrating a monthly total and a not to exceed annual total.

5.7. Completed Proposal Certification (see the below form)

PROPOSAL CERTIFICATION
RFP#2020-89

Submitted by: WEST Consultants, Inc. (formed in California)
(Must be entity's full legal name, and State of Formation)

The undersigned, through the formal submittal of this Proposal response, declares that he/she has examined all related documents and read the instruction and conditions, and hereby proposes to provide the services as specified in accordance with the RFP, for the price set forth in the Proposal documents.

Proposer, by signature below, hereby represents as follows:

- (a) That no County elected official, officer, agent or employee of the County is personally interested directly or indirectly in this contract or the compensation to be paid hereunder, and that no representation, statement or statements, oral or in writing, of the County, its elected officials, officers, agents, or employees had induced it to enter into this contract and the papers made a part hereof by its terms;
- (b) The Proposer, and each person signing on behalf of any Proposer certifies, in the case of a joint Proposal, each party thereto, certifies as to its own organization, under penalty of perjury, that to the best of their knowledge and belief:
 - 1. The prices in the Proposal have been arrived at independently, without collusion, consultation, communication, or agreement for the purpose of restraining competition as to any matter relating to such prices with any other Proposer or with any competitor;
 - 2. Unless otherwise required by law, the prices which have been quoted in the Proposal have not been knowingly disclosed by the Proposer prior to the Proposal deadline, either directly or indirectly, to any other Proposer or competitor;
 - 3. No attempt has been made nor will be made by the Proposer to induce any other person, partnership or corporation to submit or not to submit a Proposal for the purpose of restraining trade;
- (c) The Proposer fully understands and submits its Proposal with the specific knowledge that:
 - 1. The selected Proposal must be approved by the Board of Commissioners.
 - 2. This offer to provide services will remain in effect at the prices proposed for a period of not less than ninety (90) calendar days from the date that Proposals are due, and that this offer may not be withdrawn or modified during that time.
- (d) That this Proposal is made without connection with any person, firm or corporation making a bid for the same material, and is in all respects, fair and without collusion or fraud.
- (e) That the Proposer shall use recyclable products to the maximum extent economically feasible in the performance of the contract work set forth in this document.
- (f) That the Proposer accepts all terms and conditions contained in this RFP and that the RFP and the Proposal, and any modifications, will be made part of the contract documents. It is understood that all Proposals will become part of the public file on this matter. The County reserves the right to reject any or all Proposals.
- (g) That the Proposer holds current licenses that businesses or services professionals operating in this state must hold in order to undertake or perform the work specified in these contract documents.
- (h) That the Proposer is covered by liability insurance and other insurance in the amount(s) required by the solicitation and in addition that the Proposer qualifies as a carrier insured employer or a self-insured employer under ORS 656.407 or has elected coverage under ORS 656.128.
- (i) That the Proposer is legally qualified to contract with the County.
- (j) That the Proposer has not and will not discriminate in its employment practices with regard to race, creed, age, religious affiliation, sex, disability, sexual orientation, gender identity, national origin, or any other protected class. Nor has Proposer or will Proposer discriminate against a subcontractor in the awarding of a subcontract because the subcontractor is a disadvantaged business enterprise, a minority-owned business, a woman-owned business, a business that a service-disabled veteran owns or an emerging small business that is certified under ORS 200.055.



(k) The Proposer agrees to accept as full payment for the services specified herein, the amount as shown in the Proposal.

Resident Bidder, as defined in ORS 279A.120
 Non-Resident Proposer, Resident State _____
Oregon Business Registry Number 247729-80

Contractor's Authorized Representative:

Signature:  Date: December 1, 2020
Name: Hans Hadley Title: Vice President
Firm: WEST Consultants, Inc.
Address: 2601 25th Street SE, Suite 450
City/State/Zip: Salem, OR 97302 Phone: (503) 485-5490
e-mail: hhadley@westconsultants.com Fax: (503) 485-5491

Contract Manager:

Name Hans Hadley Title: Vice President
Phone number: (503) 485-5490
Email Address: hhadley@westconsultants.com

EXHIBIT B
VENDOR'S REPSONSE



December 1, 2020

Attention: George Marlton, Chief Procurement Officer

Clackamas County Public Services Building
2051 Kaen Road
Oregon City, OR 97045

River Measurement

A Division of WEST Consultants

811 NE 154th Street
Vancouver, WA 98685-1347
(360) 571-2290

Washington

12509 Bel-Red Rd., Ste. 100
Bellevue, WA 98005-2535
(425) 646-8806

Arizona

8950 S. 52nd St., Ste. 210
Tempe, AZ 85284-1043
(480) 345-2155

33252 S. Aguirre Lane, Unit A
P.O. Box 1267
Red Rock, AZ 85145-1007
(619) 865-4406

California

101 Parkshore Drive
Folsom, CA 95630-4726
(916) 932-7402

11440 W. Bernardo Ct., Ste. 360
San Diego, CA 92127-1644
(858) 487-9378

Oregon

2601 25th Street SE, Ste. 450
Salem, OR 97302-1286
(503) 485-5490

Texas

8951 Cypress Waters Blvd.
Dallas, TX 75019-4784
(214) 932-3015

Re: Request for Proposals #2020-89 for Stream Flow and Precipitation Monitoring

Dear Clackamas County Water Environment Services:

WEST Consultants, Inc. (WEST) appreciates having the opportunity to submit our qualifications to Clackamas County Water Environment Services (WES) for Streamflow and Precipitation Monitoring. As defined by ORS 279A.120, WEST is considered a resident bidder. WEST routinely installs and relocates gaging stations, operates and maintains stream and precipitation gages, processes and computes stream and precipitation data, and analyzes data and prepares reports. In addition, WEST employs industry experts in stormwater management, green infrastructure, hydraulic and hydrologic modelling, and forecast informed reservoir operations (FIRO). The WEST staff has first-hand experience with the WES stream and precipitation monitoring program, as well as the Opti CMAC systems, and has the familiarity, resources and technical skills to expertly and efficiently meet all of the needs of this project.

Our completion of assigned tasks under multiple contracts with WES from 2012-2020 demonstrate that WEST is highly capable of providing the services requested in this RFP. WEST is uniquely qualified to continue uninterrupted operation of the 4 stream gaging stations and the precipitation gage at Rowe Middle School because we have been involved with these stations since their inception. All raw data, processed data, and stage-discharge ratings are stored in our AQUARIUS water data management software – the same used by USGS. In addition, we visited sites and provided recommendations for the WES Precipitation Network Report (2019) and visited the Opti CMAC systems (2020) to provide recommendations to WES.

Our highly trained staff have many years of experience performing the work required under this contract and can provide all project elements defined in the RFP without delay. If you have any questions or need any additional information, please contact me at 503-485-5490.

Sincerely,

Hans Hadley, P.E., CFM

Vice President WEST Consultants Inc.

5.2 PROJECT UNDERSTANDING AND APPROACH

5.2.0 HISTORY

Our understanding of Clackamas County stream gaging projects dates back to 2001 when Steve Gustafson, retired WEST project manager, was contracted by the county to install staff gages and crest-stage gages for Clackamas County Water Environment Services (WES).

In 2012, we prepared a report titled *“Assessment of Stream Gaging Stations and Methodology Used for Collecting and Storing Streamflow Data”* offering site-by-site recommendations to improve the quality and reliability of streamflow data collected by WES. We evaluated site characteristics, equipment, data collection, and data processing procedures at ten (10) locations where WES had been working to compute a continuous record of streamflow.

In 2013, we worked closely with WES staff to identify locations for four new stream gages. We recommended the purchase of specific instrumentation identical to those used by the United States Geological Survey (USGS) at many gaging stations throughout the Pacific Northwest. We installed and began operation and maintenance of the Kellogg Creek and Mount Scott Creek stations in 2013, Phillips Creek in 2014, and Rock Creek in 2015.

In 2015, we were selected to perform the Stream Gage Improvement and Flow Monitoring Project for WES, and have been operating the four gaging stations ever since. During this contract we have upgraded the Kellogg Creek gaging station with a precipitation sensor and satellite telemetry. In 2019, we visited gages for the proposed precipitation network and prepared a report titled *“Precipitation Network Report for Water Environment Services”* detailing the current status of the gages and recommendations to improve the monitoring network. In 2020, we visited the Opti CMAC system to familiarize ourselves with the project and provided recommendations for future repair, operation, and maintenance. Additionally, in 2020, we assisted WES by installing three gaging stations for the Carli Creek Water Quality Project. The current contract between WEST and WES expired on November 30, 2020.

We are certified with the State of Oregon Construction Contractors Board (CCB) to perform con-

struction activities for the stream gaging, precipitation monitoring, and Opti System tasks outlined below. Our Oregon CCB license number is 172125.

5.2.1 STREAM GAGING APPROACH

The key issues to be addressed under the streamflow monitoring portion of this project are the continued use of standardized USGS field operation and maintenance procedures, standardized USGS data computation procedures utilizing appropriate software, and adherence to accepted quality assurance and quality control (QA/QC) procedures.

Our highly trained and experienced staff are fully prepared to continue operation and maintenance of the four gaging stations without any delay or need to familiarize ourselves with the project. The four stations to be operated include:

- ◆ Kellogg Creek at Rowe Middle School - 14211328
- ◆ Mt. Scott Creek at Hwy 224 - 14211350
- ◆ Phillips Creek above Sunnybrook Blvd - 14211345
- ◆ Rock Creek above Hwy 212 – 14210847

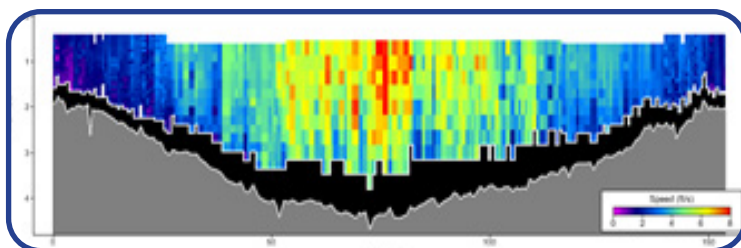


Image 1: River Cross Section with Acoustic Doppler Velocity Profiler

Our team will approach this project with the continued use of standard USGS field operation and maintenance procedures for all stream gaging stations. Routine site visits will be scheduled at approximately six- to eight-week intervals to maintain stage-discharge ratings and service equipment. Observations will be recorded while at the field site on a standard USGS or equivalent discharge measurement form. For routine site visits, the technician will read and compare stage readings from both the data logger and staff gage, download data from the data logger, note the current characteristics of the channel that influence the stage-discharge rating, conduct a discharge measurement, and service the crest-stage gage. The rechargeable 12-volt battery that powers the stage

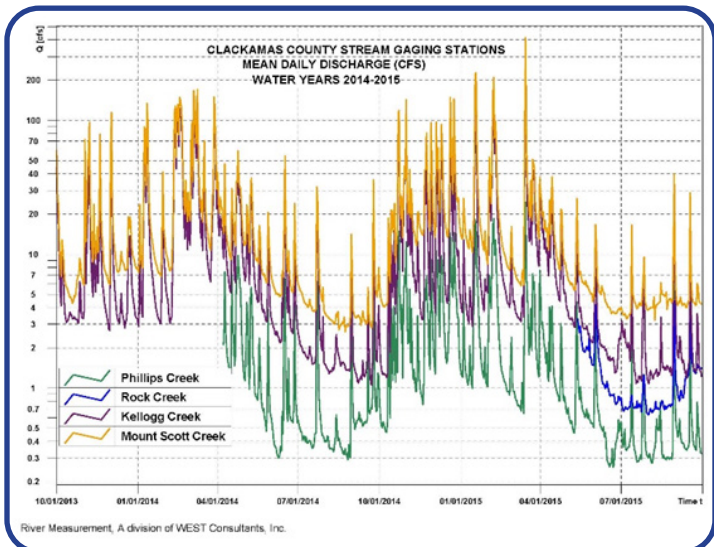


Image 2: Plot of mean daily discharge showing streams in Clackamas County during 2014-2015 water years.

sensor and data logger will be replaced as needed. An important, but often ignored, step in gaging station operation is to maintain the vertical datum that has been established at each gage. We will do this by surveying gage components every three to five years to check and adjust for any vertical movement.

The discharge measurement method used by the USGS is the Midsection Method. This method will be used to calculate discharge for the gaging station. Conducting discharge measurements at high flow will be a priority, and additional site visits may be required for

this purpose. When a stream cannot be waded safely, we will use our SonTek River Surveyor M9 Acoustic Doppler Current Profiler (ADCP) or conventional USGS type bridge equipment to measure flow.

We propose using standard USGS procedures to compute stage and discharge records for this project. The relationship between stage and discharge at each station will be established by developing stage-discharge curves for each stream gage. Discharge measurements, made with approved equipment and methods, will be used to develop and calibrate a rating curve. The stage data combined with the stage-discharge curves are used to compute discharge using the specialized AQUARIUS software developed by Aquatic Informatics.

The USGS also uses AQUARIUS for analysis and reporting of stream gage data. All raw and processed data is organized and backed-up on our servers.

During the year, we will closely monitor data from the telemetry enabled gaging stations to look for potential equipment or environmental issues. This allows us to visit sites quicker if we notice a problem affecting data collection.

At the end of each water year, we will provide the following finalized deliverables to WES:

- ◆ EXCEL table of stage and discharge for the entire year at 15-minute intervals
- ◆ EXCEL table of mean daily discharge

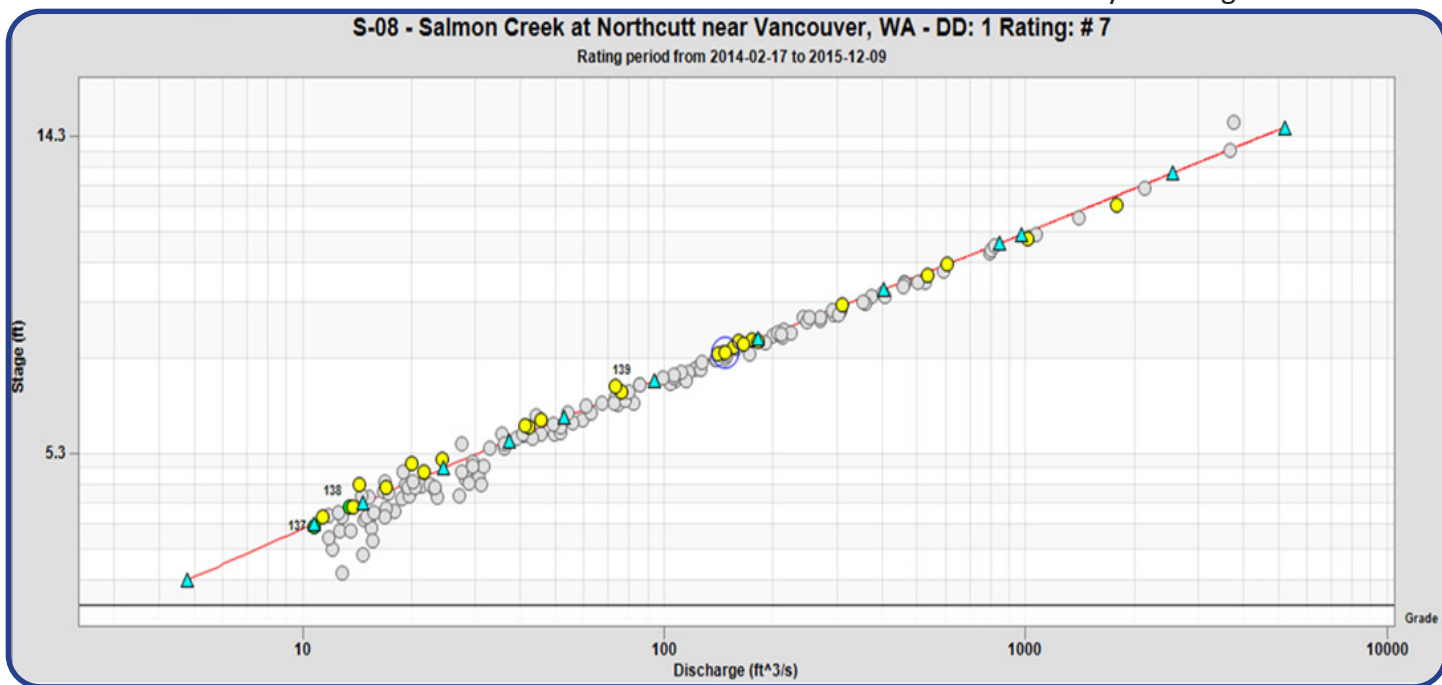


Image 3: Aquarius Rating Curve tool used for stage-discharge rating curve development and application.

- Mean daily discharge table with statistics
- Discharge measurement summary
- Station analysis document describing performance of gaging station and explanation of methods used to compute the stage and discharge record
- Plots and tables documenting stage-discharge ratings used during the year
- Hydrograph of mean daily discharge for entire year
- Results of surveying at stations
- A summary of any maintenance or repairs for each station

If new flow monitoring stations are determined to be necessary by WES, the main issues to consider will be site selection, selection and purchase of appropriate instrumentation, and assurance that installations will continue to operate long-term under all expected conditions.

5.2.2 PRECIPITATION APPROACH

Similar to the stream gaging stations, site and instrumentation selection are important considerations for precipitation monitoring. In 2019, we prepared a report detailing the proposed precipitation monitoring locations and recommended equipment to be used at those location. We will approach this project with the



Image 4: Kellogg Creek at Rowe Middle School gage after precipitation upgrade

use of standard National Oceanic and Atmospheric Administration (NOAA) and USGS operation and maintenance procedures for all precipitation gages. High quality installation, equipment, maintenance, and QA/QC of the data collected will ensure the integrity of a long-term record.

We will begin this project with a client-centric approach to review the goals of data collection, equipment, and site locations before proceeding with ordering equipment and installation of the gages. We understand the precipitation locations will include:

- Willamette Pump Station/Blue Heron
- Happy Valley Regional Pond
- Carver Pump Station
- Boring WRRF
- Hoodland WRRF
- Tri-City Treatment Plant
- Kellogg WRRF
- Kellogg at Rowe Middle School

After confirming details for each site, we will place an order for equipment which typically takes four to six weeks to arrive from manufacturers. If there are no delays, and notice to proceed is received in early January 2021, we anticipate having all the precipitation gages operating by the end of March 2021.

We propose installing the high quality TB3 tipping bucket (TB) rain gage from Hydrological Services at all locations. This widely used gage yields long-term, accurate, and repeatable results. This is the same make and model of precipitation gage that is currently installed at the Kellogg Creek at Rowe Middle School gaging station. An optional heater (TBH) will be added for sites where snow & freezing rain is expected to impact the record (Hoodland WRRF and Boring WRRF). Tipping bucket type gages are very accurate, and when connected to a datalogger can provide a continuous, long-term record without the need for operators to take precipitation measurements or retrieve data on a daily or weekly basis. When well maintained, they are one of the most accurate and affordable types of precipitation gages on the market, and they are widely used across the United States.

For data loggers at the new precipitation stations, we propose using CR300 loggers with internal cellular modems from Campbell Scientific. In our 2019 report, we originally proposed using data loggers



Image 5: WEST technician performing maintenance on a Chehalis River Basin Flood Warning precipitation gage.

purchased from Campbell Scientific and will be integrated with each data logger at Tri-City WRRF and Kellogg Creek WRRF. Standalone air temperature sensors will be deployed at the other four gages. The data loggers will be programmed to measure and record data from all sensors every 15 minutes and will be configured so that remote access is available via cellular telemetry. Currently owned LoggerNet software will allow us to download the data on a set interval to look for any problems and quickly remedy them. The cellular enabled data logger will also have the option to push data to a website where WES can quickly view and download data to see current conditions in near real-time.

from Sutron Corporation, but we have become aware of cost saving and performance advantages of using Campbell Scientific data loggers that will benefit WES. The CR300 data loggers can be configured with basic cellular telemetry and can be upgraded to satellite telemetry if desired. Meteorological sensors measuring air temperature, relative humidity, barometric pressure, wind speed, and wind direction will also be

Power sources at the new sites will be a mix of solar and alternating current (AC) power, and 12-volt battery systems will be installed at all locations to provide backup power. Data logger and power components will be installed inside locking NEMA4 enclosures to protect equipment from the weather. All components at the new precipitation stations will be installed in a manner comparable with NOAA and USGS installations. See **Table 1** on the

Location	Data Logger	Telemetry	Telemetry Type	Power	Precip	Air Temp	Wind Spd/Dir	Rel. Humidity	Barometer	Maintenance Needed
Blue Heron	CR300	Yes	Cell/GOES	Solar	TB	Yes	No	No	No	Yes
Boring	CR300	Yes	Cell/GOES	AC	TBH	Yes	No	No	No	Yes
Carver PS	CR300	Yes	Cell/GOES	Solar	TB	Yes	No	No	No	Yes
Happy Valley	Opti	Yes	Opti	AC	TB	No	No	No	No	Yes
Hoodland	CR300	Yes	Cell/GOES	AC	TBH	Yes	No	No	No	Yes
Kellogg Rowe	H-522+	Yes	GOES	Solar	TB	Yes	No	No	No	Yes
Kellogg WRRF	CR300	Yes	Cell/GOES	Solar	TB	Yes	Yes	Yes	Yes	Yes
Tri-City WRRF	CR300	Yes	Cell/GOES	Solar	TB	Yes	Yes	Yes	Yes	Yes

CR300 = Campbell Scientific, TB = Tipping bucket, TBH = Tipping bucket with heater, AC = AC power, solar = solar panel, cell = cellular modem, GOES = Geostationary Operational Environmental Satellite radio.

Table 1: summary of precipitation stations

previous page for summary of precipitation stations.

We propose visiting the sites quarterly, unless remote telemetry indicates a problem with the data that requires more immediate service. During each visit, the tipping bucket rain gage will be inspected, cleaned, and a tip test will be performed. Technicians will take detailed notes documenting existing conditions and any changes or repairs made to the station. Technicians will use an independent sensor to compare to each parameter measured at the gage. Once per year a volumetric calibration of the rain gage will be performed to ensure accurate performance. Should a precipitation gage not pass calibration, it will be removed from service and repaired. A spare precipitation gage will be installed during this time. Following established procedures like inspection, cleaning, and calibration of precipitation gages is important to collect high-quality, reliable data.

Data will be downloaded from the data logger and will be transferred to our licensed AQUARIUS software where it is backed up locally and offsite. Data will be reviewed in the software on a weekly basis to look for any potential problems.

At the end of each water year we will provide the following finalized deliverables to WES:

- ◆ EXCEL table of 15-minute, daily, and monthly precipitation
- ◆ EXCEL table and graphs of 15-minute air temperature, wind speed/direction, barometric pressure, and relative humidity
- ◆ Daily and monthly precipitation table and graph
- ◆ Station analysis document describing performance of gaging station and explanation of methods used to compute the record
- ◆ A summary of any maintenance or repairs for each station.



Image 6: Opti Pond B near SE 145th Ave.

5.2.3 OPTI CMAC

We understand that there have been chronic issues with the Opti systems located at Happy Valley Regional Pond A and Pond B. These Opti systems provide continuous monitoring and adaptive control which uses data collected at the ponds (water level) and National Weather Service (NWS) rainfall predictions to open or close the variable flow rate valve at the outlet structure of the ponds. This optimization of the pond structures helps reduce peak streamflows and pollutant transport from storm events.

We have experience with this type of system on a much larger scale. We have updated a number of water control manuals and standard operation procedures for the Corps of Engineers and Bureau of Reclamation, and have extensive experience with Forecast Informed Reservoir Operations (FIRO). Although these services from WEST are not anticipated to be used, they speak to our experience with this type of work.

We will approach this task the same as we approach all of our work. We will meet with and discuss the problems with WES to further our understanding of the issues. Once we have that information, we will assign key personnel to complete the work. The same personnel who work on the streamflow and precipitation monitoring network will be used for the Opti

systems. We will communicate with Opti and WES to develop a strategy to solve the problems for each pond. We will then work with Opti and WES to implement the solution.

During routine and corrective site visits, we will take appropriate notes and pictures to document conditions found and remedies put in place. We recommend having a base staff gage at each location with a water level sensor. This allows maintenance personnel to quickly read the current water level from the base gage and compare it to electronic readings made by a water level sensor. Typically, readings should agree at least within 0.1 ft. Stream gage and lake levels are usually measured to 0.01 ft, but that accuracy requirement may not apply to the Opti system. Differences of more than 0.1 ft would likely indicate a problem with the water level sensor. Submersible pressure transducers, like the ones installed at the ponds are subject to damage from freezing and can be affected by sedimentation.

We understand that a new water level sensor may be needed at Pond A. A Keller Levelgage submersible pressure transducer is currently installed at Pond A and costs approximately \$500 to purchase new. We can work with Opti to replace or reprogram any other components of the system that need maintenance.



Image 7: New staff gage installed for client in Clackamas County to quickly reference lake water levels.

It should be noted that the Opti Systems have **two significant safety issues** :

1. Confined space entry: The vertical shafts are considered a Confined Space for which Occupational Safety and Health Administration (OSHA) has a very stringent set of rules to follow. If needed to perform work in the space, we propose to enter using the Alternate Entry Process. To comply with this process, we will:

- a. Make site visits with two or more personnel
- b. Turn off AC or solar power at the sites
- c. Perform the work when pond levels are low, and precipitation is not expected
- d. Provide continuous forced-air ventilation into the culvert, and continuously monitor (by gas monitor instrument) for atmospheric hazards at chest level of the person working in the culvert
- e. Document each entry using an OSHA-approved form

2. 120 Volt AC power systems: A licensed electrician will perform work on the AC power systems, if needed.

We have reviewed the maintenance procedures recommended by Opti and can perform the procedures as outlined. Specifically, we will visit the ponds on a quarterly basis to inspect:

1. Level Sensor: Read the base gage and compare it to electronic water level readings, inspect for debris, fouling, and sedimentation and clean as necessary
2. Actuator: Inspect for debris, obstructions, and corrosion, and clean as necessary
3. Trash Rack and Stilling Well: Inspect for debris and clean as necessary.

We can perform winterization procedures if necessary, but it is anticipated that ponds will continue to operate year-round. We will keep a log summarizing all maintenance procedures and will provide a quarterly summary report to WES that documents all maintenance activities.

In addition to routine maintenance, it is anticipated that there will be some corrective repairs such as replacing sensors, cellular modems, actuators, or other parts. For example, the Opti Control panel communicates with the Opti Platform via a 3G cellular modem. Most major carriers have indicated that 3G service

will be discontinued from late 2020 to early 2022. We will coordinate these replacement costs with WES and work with Opti to upgrade the components as needed

5.2.4 DATA DELIVERY

Data delivery methods will be similar for the stream gaging, precipitation monitoring, and Opti System tasks. It is standard procedure to review and finalize all data following the end of each water year (October 1 to September 30). Provisional data will be sent to WES when requested prior to the end of the

water year. During data review and approval after the end of each water year, a station analysis detailing annual maintenance and computations performed on the data will be prepared. We will deliver finalized data after the end of the water year in Excel tables and other formats consistent with industry practices, such as those used by USGS. Custom reports can be created as necessary. Data can be provided via email, specified network location, FTP site, or via an alternative method specified by WES.

5.3 QUALIFICATIONS, EXPERIENCE, AND ORGANIZATION

We offer a staff that includes 57 highly trained engineering and scientific professionals, including 25 licensed engineers, specifically dedicated to the field of water resources. In addition, we have 11 Diplomates of Water Resources Engineering (D.WRE) certified by the American Academy of Water Resources Engineers (AAWRE). For over 32 years, we have been offering a unique depth and breadth of resources and experience in water resource engineering that is typically absent from much larger, less specialized, firms.

The River Measurement Division (RM) of WEST provides a full range of hydrologic data collection and hydrographic stream survey services necessary for development of watershed management and stream restoration plans, monitoring of environmental conditions, and ensuring compliance with regulatory standards. Our hydrologic data collection and hydrographic survey services include: ADCP measurements; streamflow measurements; rating curve development and records; suspended & bed load sediment samples/bed material and bank samples; water quality sampling; design/construct stream gaging stations; instrumentation selection/installation; meteorological data collection; monitoring network operation and maintenance; hydrographic surveys; and reservoir sedimentation surveys.

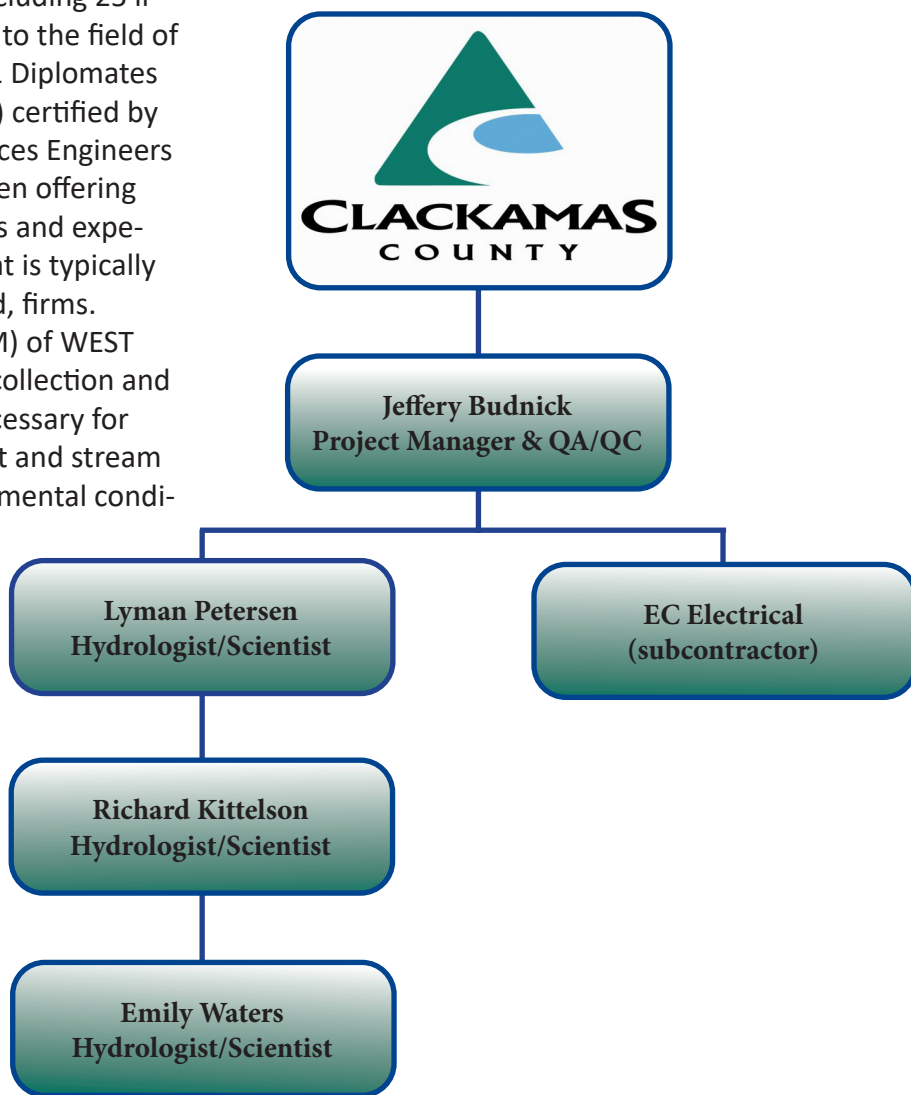


Figure 1: WEST's organizational chart

We own and routinely operate industry-standard equipment and software that is directly applicable to this project including: SonTek M9 ADCP; FlowTracker2; USGS pygmy and AA meters; bridge equipment for AA meters; data loggers; water level sensors; telemetry devices; precipitation calibration devices; AQUARIUS time series and rating development software; various survey gear including RTK GPS and robotic total station; and much more. We routinely use submersible type pressure transducers interfaced with data loggers and programmable logic controllers to measure, record, and transmit water levels in groundwater wells, rivers, lakes, and streams. We are familiar with installation and maintenance techniques for these and other types of sensors that includes ultrasonic, radar, bubbler, and shaft encoder devices for measuring water levels. We routinely service gaging stations and perform field work year-round which has allowed us to become experts at what we do.

The project team organization chart is presented as **Figure 1** on the previous page.

Qualifications for key personnel are summarized as follows (half-page resumes are provided in Appendix A):

Jeffery Budnick is the proposed project manager and QA/QC lead for the work outlined in this RFP. He will also perform field work as needed. He was chosen for his over 15 years of experience specializing in surface water and precipitation data collection projects. He has extensive experience designing, installing, troubleshooting, and operating water level, flow, water quality, and meteorological gaging stations. He also specializes in hydrographic surveying in support of WEST hydrologic and hydraulic modeling projects. He serves in his proposed capacity on the current contract with WES, as well as other similar projects for Clean Water Services and the City of Salem.

Lyman Petersen is proposed as the lead field technician for the project due to his experience working on similar projects for Clean Water Services, The Chehalis Basin Flood Authority, and the City of Salem. He will assist with installation and troubleshooting of field sites and will be involved with data analysis at the end of each water year. He has 10 years of experience specializing in hydrological and meteorological monitoring, and hydrographic surveying. Mr. Petersen has managed project logistics for building and operating

hydrological and meteorological monitoring stations both in urban settings and remote forested areas. He has operated and maintained surface and ground-water level, water quality, rainfall, and snow depth gaging stations.

Richard Kittelson will assist with field work and troubleshooting as needed for this project and was chosen for his vast experience with similar work. He has over 40 years of USGS experience in every aspect of surface water data collection, data analysis, and report writing. This includes monitoring streamflow and water quality parameters on streams that are small and intermittent, to rivers as large as the Columbia. He has made thousands of discharge measurements, in all stream environments and at extreme flows and has constructed numerous monitoring stations.

Emily Waters will assist with field work and gage installations as needed and will also perform data review at the end of each year as she does for similar projects. She has 5 years of experience with the company. She visits hydrological and meteorological monitoring stations to calibrate equipment, make flow measurements, and download data. She has also assisted with the installation of numerous stream gaging, water quality, and meteorological stations in a variety of settings. Additionally, Ms. Waters analyzes streamflow, temperature, and rainfall data, checking multiple sites weekly for site errors or data inconsistencies.

EC Electric (EC) is joining WEST for this project as a subcontractor. EC is one of the largest privately held electrical contractors in the Pacific Northwest with offices in Albany, Bay City, Eugene/Springfield, Portland, Redmond, and Seattle. They offer turnkey electrical construction solutions regardless of project scope or size. EC's outstanding service reputation goes back to the company's founding. Many of their long-term service agreements have been in place for decades and include critical operations like hospitals, transportation, and power generation. EC was chosen for this project due to their knowledge of the Opti systems. EC provided electrician services for the installation of the Opti ponds in 2017. They are involved because of the potential work on the high voltage components at the Opti ponds.

RELEVANT PROJECT EXPERIENCE

Example Project No. 1

Stream Gaging Services

Operation and maintenance of four stream gaging stations which includes one precipitation gage.

PROJECT OWNER:

Clackamas County, Oregon
Ron Wierenga, Environmental Services Manager
Water Environment Services
150 Beaver Creek Rd. #430
Oregon City, OR 97045
rwierenga@clackamas.us
503-742-4581

Relevance:

Gage maintenance	Flow measurements
Precipitation monitoring	Water quality
Repair/troubleshooting	Equipment selection
Gage installation	

WEST Team Members:

Budnick, Petersen, Kittelson, and Waters

Example Project No. 2

Miscellaneous Services

Preparation of precipitation network report, installation of water quality gages, and assessment of storm-water ponds.

PROJECT OWNER:

Clackamas County, Oregon
Ron Wierenga, Environmental Services Manager
Water Environment Services
150 Beaver Creek Rd. #430
Oregon City, OR 97045
rwierenga@clackamas.us
503-742-4581

Relevance:

Precipitation monitoring	Water quality
Repair/troubleshooting	Equipment selection
Gage installation	

WEST Team Members:

Budnick and Petersen

Example Project No. 3

Streamflow and Temperature Monitoring

Operation and maintenance of stream gaging stations

collecting stage, discharge, and water temperature data.

PROJECT OWNER:

Clean Water Services
Rajeev Kapur, Water Resources Program Manager
Regulatory Affairs Department
2550 SW Hillsboro Hwy
Hillsboro OR 97123
KapurR@CleanWaterServices.org
503-681-4424

Relevance:

Gage maintenance	Flow measurements
Water quality	Repair/troubleshooting
Equipment selection	Gage installation

WEST Team Members:

Budnick, Petersen, Kittelson, and Waters

Example Project No. 4

Flood Warning System Operation and Maintenance

Operation and maintenance of a flood warning system for the Chehalis River Basin in Washington State.

PROJECT OWNER:

Chehalis River Basin Flood Authority
Scott Boettcher
351 NW. North St
Chehalis, WA, 98532
scottb@sbgh-partners.com
360-480-6600

Relevance:

Gage maintenance	Precipitation monitoring
Repair/troubleshooting	Equipment selection
Gage installation	

WEST Team Members:

Budnick, Petersen, Kittelson, and Waters

The Vancouver, WA office of WEST will provide the services for this project. The WEST Vancouver office has been performing field work for Clackamas County WES since 2012 and is conveniently located only 30 minutes to the north of the project area. Our staff routinely group work assignments in the area to efficiently carry out tasks for clients in the same area. Because of our close proximity, we can quickly respond to storm events and provide repairs as needed.



5.4 PROJECT MANAGEMENT

We are committed to providing responsive, quality service and products to our clients. Our history of successful service is founded on project management processes developed and perfected over the past 32 years on thousands of projects for hundreds of clients. We are extremely confident in our ability to meet WES's requirements for the services listed in this RFP. We have the trained and experienced personnel, in-depth relevant project experience, excellent support staff resources, and the full range of required in-house technical abilities.

Jeffery Budnick, Senior Hydrologist and Office Manager of the WEST office in Vancouver, Washington will serve as the project manager for this project. He was selected for this role because he is the WEST project manager currently overseeing work at the four stream gaging stations listed in this RFP.

The project manager's responsibilities include:

1. Communicating with WES via email, phone, and meetings to answer questions or concerns regarding data or project needs
2. Reviewing surface-water and meteorological data collection methods
3. Reviewing deliverables of surface water and meteorological records
4. Providing assistance and review of flood measurements
5. Supervising and assisting with construction of new gaging stations
6. Assuring data collection and processing is in accordance with USGS & NOAA policy
7. Assuring the accuracy of gaging station records
8. Supervising and scheduling repair of Opti Systems
9. Assisting with field work as necessary
10. Providing progress reports as requested by WES via email
11. Contracting, communicating, and invoicing with subconsultant
12. Reviewing and answering questions related to monthly invoices sent to WES.

Companywide, WEST uses Microsoft Dynamics software for bookkeeping, billing, scheduling, tracking,

and controlling project costs. Project managers also refine project tracking using EXCEL spreadsheets.

The primary hydrologists assigned to this project are Lyman Petersen, Richard Kittelson, and Emily Waters. All are experts at installing and maintaining stream and precipitation gages, conducting discharge measurements, troubleshooting instrumentation, and computing streamflow and precipitation data. They perform this type of work daily.

The hydrologist's responsibilities include:

1. Conducting accurate discharge measurements at various flows using correct procedures for both mechanical and acoustic type current meters
2. Constructing gaging stations including installing, servicing, and repairing gaging station instruments
3. Developing and maintaining stage-discharge ratings
4. Computing stage and discharge records and writing station descriptions and analyses.
5. Communicating with WES to answer questions or concerns regarding data or stream gage equipment
6. Servicing and calibrating meteorological gages
7. Troubleshooting and maintenance of Opti systems.

5.5 QUALITY ASSURANCE / QUALITY CONTROL (QA/QC)

We will provide QA/QC services for collecting and processing streamflow data by complying with information published in the USGS Open-File Report 03-490, Version 2.0, May 2011 "*Surface-Water Quality-Assurance Plan for the U.S. Geological Survey Washington Water Science Center.*" The primary structure of our streamflow QA/QC process involves three major phases (field work, provisional data, and final data) with checklists to ensure consistency and completeness in carrying out each task. Our QA/QC procedure is robust and includes multiple reviewers and levels of review. Data graphs, plots, and stage-discharge curves will be generated using AQUARIUS data management software which aids in QA/QC.

Similar to streamflow data, meteorological data will go through a QA/QC process consistent with NOAA and USGS recommendations to remove erroneous data and verify existing data before the data are provided to WES at the end of each year. QA/QC processes as stated in section 2b of "*Characteristics of Reprocessed Hydrometeorological Automated Data System (HADS) Hourly Precipitation Data*" by Kim and Nelson (2009) will be used by WEST.

Prior to conducting the QA/QC reviews, the data from each station are uploaded into the AQUARIUS time series software where automatic QA/QC procedures look for and flag outlying data. Our hydrologists review the outliers and make expert judgments whether to accept or remove data. All raw data will be preserved, even if data are deleted from the final data set. During the QA/QC reviews, notes from site visits are reviewed and the data are compared to nearby stations. Data are graded and receive multiple approval levels during the year before a final summary and data package is prepared.

While there are no data deliverables for the Opti system task, we will review maintenance and corrective activities and supply a report at the end of the year that goes through a QA/QC process.

Station analyses created for each site summarize activities and QA/QC processes performed during the year. The project manager is ultimately responsible for QA/QC of each data deliverable before it is submitted to WES, however, all members of the WEST team participate in the QA/QC process to some degree.

5.6 FEES

A detailed budget is provided in Table 2 on the following page with estimated fees based on fiscal year (FY) from Jan. 2021 to Dec 2026. Monthly maintenance budgets are difficult to project given the nature of field work, possible storm events, and troubleshooting visits. A yearly total was calculated first and then divided by 12 to get an average monthly budget for most tasks. Actual invoicing may vary. Below are some notes and assumptions regarding the fees:

Year 1 (0.5 FY from Jan 1 to Jun 30, 2021)

TASK 1 – STREAMFLOW MONITORING

- ◇ Funds budgeted for Task 1.3 Expansion of Monitoring System are to be used only with prior approval from WES. These funds have historically been included in prior scopes of work.
- ◇ We will obtain written approval from the County before proceeding with repairs or replacement of gaging station components that either fail, are vandalized, or are damaged by floods.

TASK 2 - PRECIPITATION

- ◇ Costs for equipment purchase and installation are projected to occur from Jan. 1, 2021 to Jun. 30, 2021 but can be spread over the term of the contract if WES desires a phased installation.
- ◇ Optional: The data from the precipitation stations can be displayed on a website for WES to access for an additional \$2,400 per year.
- ◇ Optional: A Geostationary Operational Environmental Satellite (GOES) radio can be added as redundant telemetry to make data accessible to NOAA/NWS for an additional \$3,550 per station.
- ◇ Equipment will be ordered in January. Costs include spare critical components.
- ◇ Installations are planned for February/ March. Maintenance begins in February.
- ◇ Small trees near the proposed Carver site location will be removed by WES.
- ◇ Equipment fees based on quotes from manufacturers and are valid for 60 days.

- ◇ We will be provided access for installation and maintenance.

TASK 3 - OPTI SYSTEMS

- ◇ We will purchase replacement parts as needed but the exact cost of the equipment to be replaced is unknown. We understand that one pressure sensor needs to be replaced which costs approximately \$500. A total of \$2,600 has been budgeted for replacement parts. Costs in excess will require an amended contract or purchase by WES.
- ◇ We have budgeted 40 hours for repair/corrective maintenance for a two-person crew in 2021. After an initial assessment is performed with Opti, corrective costs will become clearer. Costs in excess will require an amended contract.
- ◇ We have a subcontractor for electrical work, if needed, and have them budgeted for \$4,300. Costs in excess will require an amended contract.
- ◇ Optional: Staff gages can be installed at each pond for quick reference of water levels. This can be done for an additional \$3,600 per pond.
- ◇ We assume winterization will not be needed because the ponds are likely required to operate all year round.

Year 2 (1.0 FY from Jul 1, 2021 to Jun 30, 2022)

- ◇ Streamflow Monitoring: Costs increase by 2.5%
- ◇ Precipitation Monitoring: O&M costs increase by 2.5% but equipment and installation labor are no longer a part of the budget.
- ◇ It is anticipated that Opti system repairs will be completed the first year and reduced effort is needed in subsequent years. The repair tasks costs will only be used if needed.

Years 3-6 (four full FYs)

- ◇ Costs increase approximately 2.5% from previous year's cost.

Year 7 (0.5 FY Jul 1, 2026 to Dec 31, 2026)

Detailed Fees for Stream Flow and Precipitation Monitoring RFP #2020-89

	July	August	September	October	November	December	January	February	March	April	May	June	Total
Stream Flow Network	Task 1.1 - Stream Flow O&M	\$0	\$0	\$0	\$0	\$0	\$4,317	\$4,317	\$4,317	\$4,317	\$4,317	\$4,317	\$25,902
	Task 1.2 - Emergency Repair Funds	\$0	\$0	\$0	\$0	\$0	\$167	\$167	\$167	\$167	\$167	\$167	\$1,000
	Task 1.3 - Expansion of Monitoring System	\$0	\$0	\$0	\$0	\$0	\$1,833	\$1,833	\$1,833	\$1,833	\$1,833	\$1,833	\$11,000
Precip Network	Task 2.1 - Precip Gage Equipment & Cellular Fees	\$0	\$0	\$0	\$0	\$0	\$42,571	\$72	\$72	\$72	\$72	\$72	\$42,931
	Task 2.2 - Precip Gage Installation Labor	\$0	\$0	\$0	\$0	\$0	\$0	\$9,784	\$9,784	\$0	\$0	\$0	\$19,568
	Task 2.3 - Precip Gage Maintenance	\$0	\$0	\$0	\$0	\$0	\$0	\$1,773	\$1,773	\$1,773	\$1,773	\$1,773	\$8,867
Opti System Network	Task 3.1 - Opti System Maintenance	\$0	\$0	\$0	\$0	\$0	\$544	\$544	\$544	\$544	\$544	\$544	\$3,266
	Task 3.2 - Opti Troubleshooting & Repair	\$0	\$0	\$0	\$0	\$0	\$3,008	\$3,008	\$3,008	\$3,008	\$3,008	\$3,008	\$18,050
	Year 1 (0.5 FY)	\$0	\$0	\$0	\$0	\$0	\$52,440	\$21,499	\$21,499	\$11,715	\$11,715	\$11,715	\$130,583
Stream Flow Network	Task 1.1 - Stream Flow O&M	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$4,428	\$53,141
	Task 1.2 - Emergency Repair Funds	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$171	\$2,050
	Task 1.3 - Expansion of Monitoring System	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$1,879	\$22,550
Precip Network	Task 2.1 - Precip Gage Cellular Fees	\$72	\$72	\$72	\$72	\$72	\$72	\$72	\$72	\$72	\$72	\$72	\$864
	Task 2.2 - Precip Gage Installation Labor	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
	Task 2.3 - Precip Gage Maintenance	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$1,816	\$21,796
Opti System Network	Task 3.1 - Opti System Maintenance	\$557	\$557	\$557	\$557	\$557	\$557	\$557	\$557	\$557	\$557	\$557	\$6,688
	Task 3.2 - Opti Troubleshooting & Repair	\$833	\$833	\$833	\$833	\$833	\$833	\$833	\$833	\$833	\$833	\$833	\$9,990
	Year 2 (1.0 FY)	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$9,757	\$117,079

Summary of FY Costs		Total
Year 1 (Jan. 1, 2021 to Jun. 30, 2021)	0.5 FY	\$130,583
Year 2 (Jul. 1, 2021 to Jun. 30, 2022)	1.0 FY	\$117,079
Year 3 (Jul. 1, 2022 to Jun. 30, 2023)	1.0 FY	\$120,006
Year 4 (Jul. 1, 2023 to Jun. 30, 2024)	1.0 FY	\$123,006
Year 5 (Jul. 1, 2024 to Jun. 30, 2025)	1.0 FY	\$126,081
Year 6 (Jul. 1, 2025 to Jun. 30, 2026)	1.0 FY	\$129,233
Year 7 (Jul. 1, 2026 to Dec. 31, 2026)	0.5 FY	\$66,232



APPENDIX A: SHORT RESUMES



Jeffery Budnick
15 years experience

Education:
B.S., Earth Sciences & Geology, Western Oregon University

Role:
Project Manager/QA&QC/
Hydrologist/Scientist

Mr. Budnick has experience choosing gaging locations and equipment that will collect high quality data to meet project needs. He has built and operated stream & meteorological gages, as well as computed records for over 100 gaging stations. Mr. Budnick has installed continuous-record streamflow, meteorological, water quality and tide gages – many of which incorporate near real-time telemetry systems, such as GOES, Iridium, cell-modem, radio, and land-line communications to transmit data. Mr. Budnick installs gaging stations that will withstand extreme weather and high flow events, reducing the need for costly repairs. The stations include sensors and data loggers installed to record parameters such as stage, water and air temperature, velocity, wind, precipitation, and numerous water quality parameters.

Mr. Budnick has experience installing, operating, and troubleshooting industry standard equipment made by companies such as Campbell Scientific, Design Analysis/Waterlog, Sontek/YSI, and Sutron. Mr. Budnick adheres to U.S. Geological Survey (USGS) protocols and methods for collecting data. He has made hundreds of discharge measurements with conventional and ADCP equipment under a range of flow conditions. Mr. Budnick uses AQUARIUS time-series software to compute continuous surface water records and develop stage-discharge and index-velocity ratings. He also prepares and reviews final reports required by clients at the end of the water or calendar year.

As survey crew chief Mr. Budnick has surveyed hundreds of bridges and culverts and thousands of cross sections.



Lyman J. Petersen III
Nine years experience

Education:
B.S., Watershed Management & Soils, Humboldt State University

Role:
Hydrologist

Mr. Petersen has managed project logistics for building and operating hydrological and meteorological monitoring stations both in urban settings and remote forested areas. He has operated and maintained surface and groundwater level, water quality, rainfall, and snow depth gaging stations. He is involved in all aspects of monitoring stations which include: site selection, design, equipment purchase, installation, maintenance, troubleshooting, data analysis, and report writing.

Prior to joining WEST, he worked for the Yosemite National Park Service and Green Diamond Resource Company. His work has entailed maintaining hydrological and meteorological stations, taking flow measurements, and water quality sampling and analysis. Additionally, he has conducted water supply evaluation studies quantifying flows, turbidity threshold monitoring, post-fire watershed studies, coordinating crew activities, maintaining installed equipment, data retrieval and management, and report writing. His work has contributed to ensuring water quality and supply, efficient planning, flood and weather forecasting, and research.

He has installed and maintained a number of continuous monitoring stations some of which incorporate real-time telemetry systems, such as GOES and radio communications to transmit data. Sensors installed at these gaging sites record parameters such as stage, turbidity, conductivity, pH, DO, water and air temperature, velocity, rainfall, and snow depth. He has experience using equipment made by a variety of vendors including: Campbell Scientific, Design Analysis/Waterlog, Sontek/YSI, Solinst, FTS, HOB0, ISCO, and many others.



Richard L. Kittelson
41 years experience

Education:
B.A. (Geography)
Moorhead State University

Role:
Hydrologist/Scientist



Emily Waters
Five years experience

Education:
B.S., Geography, Portland State University
M.S.L., Environmental Law, Lewis & Clark College (in-process)

Role:
Hydrologist/Scientist

Mr. Kittelson is a Hydrologist/Scientist at WEST Consultants. Prior to joining WEST he worked at the U.S. Geological Survey for 40 years in the field of Surface Water Hydrology.

Mr. Kittelson's experience consists of an extensive background in every aspect of surface water data collection, data analysis and report writing. This included monitoring streamflow and water quality parameters on streams that are small and intermittent, to rivers as large as the Columbia. He has made thousands of discharge measurements, in all stream environments and at extreme flows. Mr. Kittelson selected sites, designed and constructed numerous gaging stations and stream gaging cableways. He mentored other State and Federal Agencies in data collection, the use of hydrologic instrumentation, radio networks and satellite telemetry. Additionally, he reviewed records of other Agencies, recommending improvements in instrumentation, data collection technique, and record computation methodology.

Mr. Kittelson has been the Project Leader on many data collection projects such as suspended sediment monitoring, bedload monitoring, fish screen/velocity studies, seepage runs and state-wide low flow assessments. Mr. Kittelson also performed the data collection and computation of numerous peak flows by slope-area method.

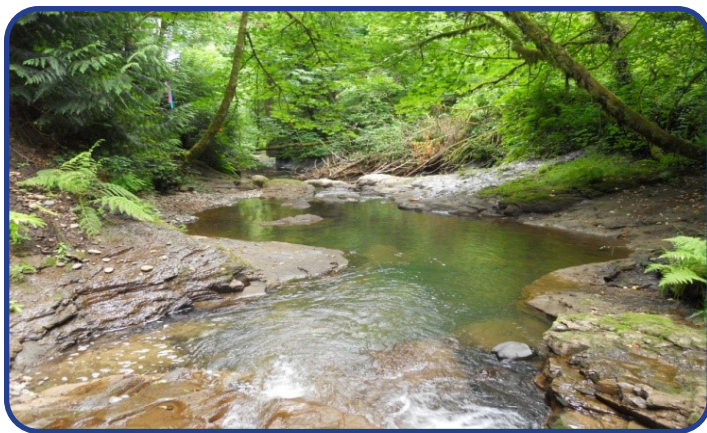
Ms. Waters conducts routine site visits of hydrological and meteorological monitoring stations to calibrate equipment, make flow measurements, and download data. She has also assisted with the installation of numerous stream gaging, water quality, and meteorological stations in a variety of settings. Additionally, she analyzes streamflow, temperature, and rainfall data, checking multiple sites weekly for site errors or data inconsistencies. Using AQUARIUS Time-Series software, she develops stage-discharge records and prepares both provisional and year end hydrological reports for clients.

She has also worked on water quality sampling projects for shallow groundwater well monitoring, and surface water quality monitoring in urban streams. Other projects include large- and small-scale hydrographic survey work and project management.

While performing site visits and during the record-working process, she follows USGS protocols and methods for collecting and reviewing streamflow, temperature, and rainfall data. She is respectful of private property owners, and engages with the public in a personal and professional manner.

Before joining WEST, she studied environmental geography and ecology. During her undergraduate career she studied the connections between ecological disturbance and invasive species propagation in and around the Mt. St. Helens National Monument. She also worked with a public utility on invasive species eradication, using GPS locators to tag plants in a local watershed, returning later to treat species with state-approved herbicides. This work included teaching the community about the local watershed, basic stream restoration principles, and ensuring volunteer safety during survey and treatment events.

APPENDIX B: PROJECT EXAMPLES



1. Stream Gaging Services for Clackamas County Water Environment Services - Clackamas County, Oregon

In 2012, River Measurement, a division of WEST Consultants, Inc. (WEST) was contracted by Clackamas County Water Environment Services (WES) to assist with improving the stream gaging network. The goal was to have all stations in the stream gaging network provide a complete record of stage and discharge data that meet or exceed USGS requirements.

WEST hydrologists reviewed previous flow monitoring assessment reports, discussed equipment and procedures with WES staff, and visited ten field sites to document the instrumentation used and physical characteristics at each stream gage. This information was compiled in a report which outlines, site-by-site, what could be done to significantly improve the quality and reliability of streamflow data collected in Clackamas County.

WEST was awarded three-year contract in 2013 and a 5-year contract in 2015 to install and operate new stream gaging stations. The first stations were installed on Kellogg Creek, Mount Scott Creek, Rock Creek, and Phillips Creek. WEST currently provides all operation and maintenance for these sites and provides WES with complete and reliable data at these locations at a reasonable cost. In 2017, WEST staff upgraded the Kellogg Creek station to provide access to real-time data via GOES satellite and added a precipitation gage. WEST ensures that each stream gage will provide a continuous record of stage, discharge, and water temperature. USGS approved instrumentation and procedures are used to collect and compute streamflow data. The stations are built to last for many years and remain operational during all flow conditions.

2. Miscellaneous Services for Clackamas County Water Environment Services - Clackamas County, Oregon

In addition to the streamgaging tasks that WEST has been assigned at Phillips, Mt. Scott, Kellogg, and Rock Creeks from 2015 to 2020, WEST performed three additional tasks for Clackamas County Water Environment Services (WES) during this contract.

In 2019 WEST visited 8 precipitation gaging stations that are currently operating or that WES wishes to collect precipitation data at. WEST provided a report documenting the existing equipment and location of equipment at each site and proposed changes to equipment and installation location to collect higher quality precipitation data.

The report also included recommendations for annual maintenance and QA/QC of the data to provide a defensible, long-term data set.

In 2020 WEST built three custom stream gages for the Carli Creek Water Quality project that WES is monitoring. The gages were custom designed to assist with WES water quality monitoring objectives.

Also in 2020, WEST visited Opti CMAC ponds with WES to provide recommendations for operation, maintenance, and corrective actions.



3. Streamflow and Temperature Monitoring for Clean Water Services - Hillsboro, Oregon

River Measurement, a division of WEST Consultants, Inc., has contracted to operate and maintain continuous record stream gaging stations for Clean Water Services since 2008. Work began with 28 stream gaging stations and 53 water temperature sites. The number and locations of stream gages has changed from year to year as we continue to select, build, and operate new sites, as well as to discontinue others to meet the changing data needs and budget of Clean Water Services. Each gaging station has a data logger with stage and water temperature sensors. One station has a sophisticated acoustic area-velocity meter (AVM). Another station is operated jointly with the U.S. Geological Survey (USGS).

River Measurement independently operates and maintains all equipment at the stream gages. We conduct discharge measurements, develop stage-discharge rating curves, perform data analysis, and compute 15-minute values of stage and flow at each station. Hourly, maximum, minimum, and mean daily water temperature is provided. Standard USGS methods and equipment are used to collect and compute data. Recommendations are given for relocation of gaging stations and equipment upgrades at sites that have a history of missing or inaccurate data.

Most of the gaging stations are located on small streams where data collection and discharge computations are complicated by factors such as beaver dams and short duration flood peaks. WEST staff meets these challenges by scheduling site visits when needed to address potential problems, through careful planning, and by focused and rapid response to high-water events.

4. Flood Warning System Operation and Maintenance - Lewis County, WA

Lewis County experienced major flooding in 1996 and 2007. In 2010 WEST submitted a report with recommendations for improvements that could be made to the existing Chehalis River Flood Warning System. WEST developed a comprehensive, basin-wide flood warning system that brings all real-time flood warning data collected by several different agencies to a common website. The website displays current stage and discharge of rivers, real-time inundation maps, and precipitation rates and amounts. It has become *the* portal for flood information.

River Measurement identified locations for new data collection sites, and installed 10 real-time monitoring stations. The stations sensors measure river levels, precipitation, air temperature, barometric pressure, relative humidity, solar radiation, wind velocity, and wind direction. All instrumentation is powered by 12-volt batteries connected to solar panel.

The two National Weather Service-owned stream gages near Centralia, WA are critical components of the warning system. Located in the most populous region of the basin, these gages support river forecasts, and are among the most requested locations for flood or high-water alerts. Both gages had been in operation for many decades, but recent performance had degraded. On-going sediment buildup in the stilling well contributed to delayed and erroneous stage readings.

In 2017, WEST upgraded the equipment at these two locations. The outdated equipment was replaced by electronic stage sensors and the data is now recorded on site by data loggers. Near real-time data is now transmitted using the National Environmental Satellite Data and Information Service GOES system.