EXHIBIT A
Scope of Work
Amendment No. 3
City of Snoqualmie
Water Reclamation Facility Phase 3 Improvements
Services During Construction
March 2023

Background

The City of Snoqualmie (City) owns and operates the Water Reclamation Facility (WRF) and the Kimball Creek Lift Station (LS). To accommodate projected flows and loads, handle replacement of aging components installed over 20 years ago, and meet regulatory requirements, the City's 2021 *General Sewer Plan* (GSP) identified multiple projects for Phase 3 of the WRF Improvements. This Scope of Work includes Tasks necessary to provide services during construction (SDC) for the Major WRF Improvements as follows:

- Capital Improvement Program (CIP) F8 – Activated Sludge Basins Improvements: The capacity of the existing secondary treatment process nearly is exceeded at current loading. Additionally, the existing oxidation ditch equipment needs replacement due to its age. This project will convert the existing oxidation ditches into plug flow activated sludge basins with the goal of producing an activated sludge that increases the biological treatment capacity within the existing tankage while providing nutrient removal. With substantially increased mixed liquor settleability, an additional secondary clarifier likely can be avoided in the near term.
- CIP F5 – Grit Removal System Improvement Project: A significant portion of the existing grit system was replaced with the Phase 2 project, though the internal portions of the grit chamber have not been refurbished. These should be replaced due to age and any additional improvements to increase grit capture efficiency should be made.
    - During design of the Phase 3 improvements it was determined that the existing headworks screen needs to be removed and replaced.
- CIP DF6 – Aerobic Digester Aeration Improvements: Replace the existing membrane aeration equipment in the first two digesters with jet aeration equipment. This will include removal of the diffusers and top-entering mixers in these digesters. A jet aeration manifold and submersible recycle pump will be installed in each of these digesters, along with mechanical changes to support these additions. Electrical and control improvements also will be made to support these improvements.

The previous scope of work included the following tasks:

Task 1 – Project Management
Task 2 – Preliminary Design of Major WRF Improvements
Task 3 – Preliminary and Final Design of Kimball Creek LS
Task 4 – Management Reserve
Task 5 – Services During Bidding (SDB) for Kimball Creek LS
Task 6 – Final Design of Major WRF Improvements
Task 7 – Washington State Department of Ecology (Ecology) Review and City Permitting for Major WRF Improvements
Task 8 – SDB for Major WRF Improvements
Task 9 – SDC for Kimball Creek LS
Task 10 – Supervisory Control and Data Acquisition (SCADA) Programming for Kimball Creek LS

This Scope of Work includes expanding project management services in Task 1, increasing the management reserve of Task 4, and the addition of the following tasks:

Task 11 – SDC for Major WRF Improvements
Task 12 – SCADA Programming for Major WRF Improvements

Future tasks include the following:

Task 13 – Preliminary Design for Minor WRF Improvements (as identified in the GSP)

This Scope of Work captures elements for SDC for the Major WRF Improvements project.

Task 1 – Project Management

Objective: Manage RH2 Engineering, Inc.'s (RH2) project team and maintain frequent client communications. Maintain project schedule and prepare monthly invoices and budget status summaries. This existing task is amended to cover the extended duration of the contract amendment.

Approach:

1.1 Perform Project Management:

- Provide direction, coordination, and oversight to the RH2 project team. Organize, manage, and coordinate technical disciplines as described herein, and implement quality assurance and quality control reviews to execute this Scope of Work in close coordination with City staff.
- Document and retain information generated during the execution of the project.
- Prepare monthly invoices and budget status summaries.

RH2 Deliverables:

- Monthly progress reports with schedule, budget, work performed, and billed to date updates in electronic PDF.

Task 4 – Management Reserve

Objective: Provide additional services as requested by the City. This existing Task is amended to cover the extended duration of the contract amendment.

Approach:

4.1 Provide additional services as requested and authorized by the City. Submit a scope of work and budget estimate for supplemental services requested by the City. The City shall provide written authorization to proceed with any supplemental services.

RH2 Deliverables:

- Scope of work and budget estimate for supplemental services in electronic PDF.
- Other deliverables as requested by the City under the authorization for any supplemental services throughout the duration of Tasks 1 through 12.

Task 11 – SDC for Major WRF Improvements

Objective: Provide limited engineering SDC of the Phase 3 improvements to the level of effort stated in the fee estimate.

Approach:

11.1 Prepare Conformed for Construction Documents – Revise and update the bid plans, non-technical and technical specifications, and appendices to reflect addenda issued during the bidding phase. Print hard copies of the conformed for construction documents for contractor, City, and RH2 use during construction. Revise and update the equipment list, instrumentation schedule, and process control narratives, if applicable, to reflect addenda issued during the bidding phase.

11.2 Attend Pre-Construction Meeting – Prepare pre-construction meeting agenda. Send notice of meeting location, data, and time, along with the agenda, to invitees. Attend the meeting. Prepare meeting minutes and distribute to attendees.

11.3 Provide Construction Consultation and Document Review – Consult with the City on construction costs, scheduling, and constructability issues. Review shop drawings and catalog submittals of items requested in the technical specifications. Provide a written response to the contractor and the City accepting or rejecting each shop drawing and catalog submittal reviewed. Review written requests for information (RFIs) and change order proposals, and provide written responses to the contractor and the City. Review monthly pay requests by the contractor and coordinate with the City for processing payment. Prepare Construction Quality Assurance Plan (CQAP) and submit to Ecology for documentation, incorporating any minor comments from Ecology if provided.

11.4 Provide Part-Time On-Site Construction Observation – Provide at least two (2) RH2 representatives every two (2) weeks at construction progress meetings. Prepare meeting minutes and distribute to attendees. Review contractor's look-ahead construction schedule.

Provide one (1) RH2 representative for part-time on-site construction observation and prepare observation reports. *It is assumed that part-time construction observation includes, on average, approximately thirty-two (32) hours per week of construction support services for forty-eight (48) weeks of construction observation.* Prepare progress reports, including contract time remaining statements. Coordinate with the contractor regarding construction schedule, progress, and constructability issues. Retain the services for a certified testing company as a subconsultant for material testing and special inspections.

11.5 Provide Testing and Startup Observation – Coordinate with the contractor and the City for the scheduled testing and startup activities. *This coordination will include the review and supplementation of the testing protocols developed by the contractor and manufacturers' representatives, and review of the tests and request for corrections*. Review and supplement startup protocols developed by the contractor and manufacturers' representatives. Provide at least two (2) RH2 representatives for on-site observation during startup to document activities and coordinate with the contractor. Discuss with the contractor and the City work that has not been completed by the contractor (punch list) and discuss contractor rectification.

11.6 Review Construction Record Drawings and Operations and Maintenance Manuals – Obtain contractor and City construction field records. Review field records, including RH2's, and revise the conformed for construction drawings to construction record plan drawings. Review the contractor-provided operations and maintenance (O&M) manuals for consistency with installed equipment and instrumentation.

11.7 Provide Final Observation and Project Closeout – Attend a final on-site observation with the City and prepare a letter of recommendation for project acceptance to the City. Prepare and submit the Ecology Construction Completion form.

11.8 Prepare Facility O&M Manuals – Prepare detailed O&M manual sections for the WRF Phase 3 improvements. Include an overview of process components, detailed descriptions of normal and emergency operational procedures, troubleshooting and preventative maintenance measures, and operator safety considerations. Include appendices of process schematics, manufacturer documentation, material safety data sheets, and periodic operations checklists. Provide Ecology a copy of the WRF O&M manual sections for review and incorporate comments into the final O&M manual section documents.

Assumptions:

- *The estimate of professional services for the construction phase of the project assumes a construction schedule and contractor progress that are typical for the industry and for projects similar to this one.*
- *RH2 will be the primary point of contact for the general contractor during construction; however, RH2 has not included full-time construction observation services in the Fee Estimate. It is assumed that part-time site observation will be sufficient.*

- *RH2 is not responsible for site safety, for determining means and methods, nor for directing the contractor in their work.*
- *No date is warranted or implied for agency response or approval of submittals.*

Provided by the City:

- Meeting space and attendance at the pre-construction meeting.
- Conformed for construction non-technical specifications.
- Processing payments to the contractor.
- Attendance at construction progress meetings.

RH2 Deliverables:

- CQAP submitted to Ecology and duplicate copy to the City.
- One (1) PDF and one (1) Word file (for the City) of the pre-construction meeting agenda and hard copies for attendees.
- Notice to invitees of the pre-construction meeting location, date, and time in electronic PDF.
- One (1) hard copy, one (1) PDF, and one (1) Word file of the pre-construction meeting minutes.
- Two (2) full-size hard copies and two (2) half-size hard copies of the conformed for construction plans, two (2) hard copies of the conformed for construction specifications and appendices, and one (1) PDF of the conformed for construction plans, specifications, and appendices for the contractor.
- Five (5) hard copies, one (1) PDF, and one (1) Word file (specifications) of the conformed for construction plans (half-size), specifications, and appendices for the City.
- Written responses for contractor-provided shop drawings and submittals, RFIs, change orders, and pay requests in electronic PDF.
- Construction progress meeting minutes in PDF and Word format.
- Construction observation reports in PDF and Word format.
- Construction progress reports and contract time remaining statements in PDF and Word/Excel format.
- Written responses to contractor-provided testing and startup protocols and for requests to contractor for correction.
- Startup checklists and summaries of startup results in PDF and Excel format.
- Written punch list to contractor and one (1) hard copy, one (1) PDF, and one (1) Word file for the City.

- One (1) hard copy, one (1) PDF, and one (1) Word file of letter of recommendation for project acceptance.
- One (1) hard copy of Construction Completion form submitted to Ecology and one (1) PDF duplicate to the City.
- Written responses for review of contractor-provided O&M manuals.
- Two (2) full-size hard copies, one (1) PDF, and AutoCAD DWG files of the construction record plan drawings.
- Five (5) hard copies, one (1) PDF, and one (1) Word file of the draft WRF O&M manual sections for the improvements.
- Five (5) hard copies, one (1) PDF, and one (1) Word file of the final draft WRF O&M manual sections for the improvements.

Task 12 – SCADA Programming for Major WRF Improvements

Objective: Manage and coordinate RH2's engineering disciplines and related services required for project control system software integration completion for the WRF Phase 3 improvements. Provide control software development services for new OI and PLC equipment. Provide software development services for SCADA computer systems. Provide factory testing, field testing, startup, and commissioning support services related to the control system software at the WRF.

Approach:

12.1 Communicate with City and Develop Action Items – Communicate issues with the City project team by phone on an as-needed basis. Develop meeting minutes and submit them within three (3) days of meetings, site visits, or conference calls. Develop and maintain an action item list that includes owner of each action item. Update list on a weekly basis at a minimum.

12.2 Coordinate SCADA Development Workshops – Coordinate a maximum of three (3) software development workshops and two (2) process review workshops. Workshops will be used to review:

- Existing facility control processes;
- Facility data point standards;
- Instrumentation standards;
- PLC control standards;
- SCADA computer/communications network system design;
- SCADA security/system access;
- HMI data/graphic object standards;
- Historical trending standards;

- Alarm notification standards; and
- Implementation/commissioning methodology and schedule.

12.3 Develop PLC Software – Develop the PLC data point names, descriptions, and addresses based on the control panel design and City data point standards defined in subtask 12.2 and gathered during the workshops. Develop control loop descriptions, alarm interlocks, and control data required between controllers based on facility requirements. Develop software using Studio 5000 for Logix PLCs based on the previously defined PLC information.

12.4 Develop OI Software – Develop the OI for the control panels. *OI screen designs will be consistent with HMI screen designs. OI screens will contain the same graphical program that will be a subset of the HMI screen design. City staff will have final approval of HMI screen designs.*

12.5 Configure and Develop SCADA Computer Software – Work with City staff to design and configure HMI computer systems and develop HMI screen designs and layouts based on HMI standards defined by the City SCADA Master Plan and at software development workshops. *City staff will have final approval of HMI screen designs*. Work with City staff to develop the following HMI computer software:

- Update to overall facility process display that identifies major plant information in one overall screen. Links from this screen will dynamically display facility subsections.
- Facility displays for each treatment subsystem.
- Facility setpoint control components.
- Facility real time and historical alarms and events displays. *Historical displays will filter alarms and events by specific time and data*.
- Facility historical trending of analog and discrete data. This screen will be configurable to display normal groups of data or ad-hoc data. Trend data/time information will be selectable. Trend data will be capable of exporting to CSV files.
- Summary displays will show summaries of totals, averages, minimums, and maximums. This information will be displayed for daily, monthly, and yearly periods of time.
- Develop system reports based on information identified during software development workshops.

12.6 Review and Integrate Packaged Sub Systems – Coordinate with prepackaged system suppliers regarding integration into the facility control system. *This work will consist of review and approval of City selected subsystem control interfaces and integration of the subsystems into the overall control network.*

12.7 Attend Factory Testing – Attend a factory test at the contractor's panel shop, which will include RH2 observing the following:

- Comparison of the final fabricated products against the original design criteria.
- Testing of the power systems.
- Testing of the networking and communications components.
- Testing of the PLC controller and OI.
- Testing of the discrete and analog inputs and outputs through simulation equipment.
- Loading the latest software in the PLC and OI software.
- Testing of the PLC analog scaling code.
- Testing of the PLC system alarms code.
- Testing of the PLC totalizing and system summary code.
- Testing of the PLC control loops code.
- Testing of the OI code during PLC code testing.

The City will be invited to approve the final panel configuration at the contractor's panel shop after testing is complete and to use this opportunity as a first level of training on the use of the field control equipment. Prepare a factory test report for each control panel.

12.8 Attend Startup and Commissioning

- SCADA Computer Systems
    - Work with City staff to install and configure existing HMI computer systems. *This work will consist of updating existing computer HMI software and software utilities required to maintain the SCADA computer systems.*
- Facility Startup and Commissioning

  The contractor will determine the order of the startup based on the implementation plan in the project specifications. Once the contractor, the City, and RH2 agree on startup data, the following steps will be implemented:

  1. Install facility software components on the SCADA computers prior to testing.
  2. RH2, the City, and the contractor will be on site at the WRF during testing.
  3. Rerun the factory tests that were implemented during subtask 12.7 using existing facility instrumentation.
  4. Test communications between the facility controllers and the HMI computer systems.
  5. Test data points and control capabilities between the facility controllers.
  6. RH2, the contractor, and the City will test control capabilities of the facility.

7. Add installation failures identified during startup to a punch list for the contractor to resolve. *It is understood that these failures may be resolved during startup, or may require additional time to resolve and cause testing to be delayed*.
8. RH2 and the City will approve the completion of a facility based on the original design and information developed and approved in subtasks 12.1 through 12.5. *Major changes to the system at the time of testing are not included in this Scope of Work*.

12.9 Prepare O&M Documentation – Prepare documentation material of the SCADA system for current and future operations and maintenance of the system. Prepare functional descriptions for the existing WRF processes. Document final commissioning report based on startup reports. Coordinate with the contractor to prepare O&M documentation identified in the project specifications. Supply control system documentation and software to the contractor for inclusion in the final O&M documents. Review control system O&M material with City staff. *This will consist of final drawings, software, software documentation, and control system operations documentation*.

12.10 Provide Training – Provide training for City staff at points throughout the duration of the project to augment staff understanding of the completed SCADA system.

- At the end of the factory testing, City staff will be invited to review the final operation of each facility control panel before it is installed in the field. *This is the first level of training that enables City staff to view hardware and software components before they are installed. This also enables the City to identify minor software or hardware issues that can be resolved before installation.*
- During installation, City staff may work with the contractor to test instrumentation wiring prior to startup to prevent delays during final testing. *This exercise will train City staff on the facility instrumentation and how it interacts with the new automatic control equipment.*
- During final startup and commissioning, City staff will be onsite to help with the testing identified in Subtask 12.8. *This will be the City's first experience using the system in an operating facility.*
- After final startup and commissioning, formal training will be provided at the WRF using preliminary O&M documentation.

Provide up to two (2) eight (8) hour formal on-site training classes at the City headquarters to familiarize City staff with aspects of the control system utilizing the O&M manual as a training aid. RH2 to coordinate with the City on scheduling this training session to accommodate City staff availability.

12.11 Provide Ongoing Support – Provide additional support after final commissioning training. *This support will consist of software support or additional facility training*. Provide additional control system support for a period of one (1) year after Final Acceptance of the constructed

improvements based on feedback from City staff regarding the operations of the facility. Provide additional training support for a period of one (1) year after Final Acceptance of the constructed improvements based on requests from City staff.

Assumptions:

- *RH2's Task 12 will provide total hours of work as identified in **Exhibit B** for software development, testing, and startup services to City staff as described to the City. City staff will review and approve all information defined in subtask 12.2 before PLC software development begins. City staff will review and approve all OI and HMI screen designs developed in subtasks 12.4 and 12.5. City staff will be responsible for final approval of design within a reasonable timeframe. RH2's Fee Estimate assumes a certain level of cooperation and timeliness from any third parties required for testing. All installation will be performed by others. If additional hours are needed to accomplish Task 12 due to events beyond RH2's control, RH2 will notify the City in advance of additional hours needed, and additional hours shall be mutually negotiated.*
- *This Scope of Work does not include HMI data point validation of remote LS facilities. It is assumed that the existing HMI data points for remote LS facilities are valid.*
- *RH2 is not responsible for site safety or directing others in their work.*

Provided by the City:

- All documentation related to the SCADA system.

RH2 Deliverables:

- Completed PLC information developed during subtask 12.3.
- Completed OI and HMI screen designs developed in subtasks 12.4 and 12.5.
- Factory testing reports completed during subtask 12.7.
- Final startup and commissioning reports completed during subtask 12.8.
- One (1) electronic copy of PLC and OI software and SCADA computer system software.
- One (1) electronic copy of the following items:
    - Project spreadsheet file that includes information about the software configuration, addressing, data point names, alarms, control loops, and operations documentation.
    - SCADA computers configuration information.
    - O&M material from the contractor as specified in contract documents.

Project Schedule

RH2 anticipates that SDC for the Major WRF Improvements will begin in July 2023 with a target completion date of August 2025 for the process and mechanical portions of the project and August 2026 for the completion of ongoing control systems integration support.

EXHIBIT B

Fee Estimate
Amendment No. 3
City of Snoqualmie
Water Reclamation Facility Phase 3 Improvements
Services During Construction
May-23

	Description	Total Hours	Total Labor	Total Subconsultant	Total Expense	Total Cost
Task 1	**Project Management**	**116**	**$ 28,778**	**$ -**	**$ 719**	**$ 29,497**
1.1	Perform Project Management	116	$ 28,778	$ -	$ 719	$ 29,497
Task 4	**Management Reserve**	**-**	**$ 45,000**	**$ -**	**$ 5,000**	**$ 50,000**
4.1	Provide Additional Services as Requested	-	$ 45,000	$ -	$ 5,000	$ 50,000
Task 11	**Services During Construction for WRF Phase 3 Improvements**	**4531**	**$ 888,683**	**$ 39,841**	**$ 51,309**	**$ 979,833**
11.1	Prepare Conformed for Construction Documents	67	$ 11,996	$ -	$ 3,796	$ 15,792
11.2	Attend Pre-Construction Meeting	24	$ 4,784	$ -	$ 216	$ 5,000
11.3	Provide Construction Consultation and Document Review	879	$ 180,202	$ -	$ 5,033	$ 185,235
11.4	Provide Part-Time On-Site Construction Observation	2408	$ 457,524	$ 39,841	$ 31,598	$ 528,963
11.5	Provide Testing and Startup Observation	670	$ 136,930	$ -	$ 4,943	$ 141,873
11.6	Review Construction Record Drawings and Contractor-Provided O&M Manuals	162	$ 31,176	$ -	$ 3,679	$ 34,855
11.7	Final Observation and Project Closeout	145	$ 29,603	$ -	$ 877	$ 30,480
11.8	Prepare Facility O&M Manuals	176	$ 36,468	$ -	$ 1,168	$ 37,636
Task 12	**Control System Software Integration for WRF Phase 3 Improvements**	**1255**	**$ 304,770**	**$ -**	**$ 8,995**	**$ 313,765**
12.1	Project Team Conference Calls and Action Items	88	$ 20,494	$ -	$ 512	$ 21,006
12.2	Coordinate SCADA Development Workshops	114	$ 26,130	$ -	$ 653	$ 26,783
12.3	Develop PLC Software	172	$ 41,606	$ -	$ 1,040	$ 42,646
12.4	Develop OI Software	42	$ 10,616	$ -	$ 265	$ 10,881
12.5	Configure and Develop SCADA Computer Software	172	$ 44,886	$ -	$ 1,122	$ 46,008
12.6	Review and Integrate Prepackaged Sub Systems	61	$ 14,936	$ -	$ 373	$ 15,309
12.7	Attend Factory Testing	36	$ 7,614	$ -	$ 256	$ 7,870
12.8	Attend Startup and Commissioning	332	$ 80,606	$ -	$ 3,325	$ 83,931
12.9	Prepare O&M Documentation	86	$ 19,936	$ -	$ 498	$ 20,434
12.10	Provide Training	52	$ 12,986	$ -	$ 325	$ 13,311
12.11	Provide Ongoing Support	100	$ 24,960	$ -	$ 624	$ 25,584
	PROJECT TOTAL	**5902**	**$ 1,267,231**	**$ 39,841**	**$ 66,023**	**$ 1,373,095**

EXHIBIT C RH2 ENGINEERING, INC. 2023 SCHEDULE OF RATES AND CHARGES		
RATE LIST	**RATE**	**UNIT**
Professional I	$161	$/hr
Professional II	$178	$/hr
Professional III	$198	$/hr
Professional IV	$217	$/hr
Professional V	$233	$/hr
Professional VI	$247	$/hr
Professional VII	$265	$/hr
Professional VIII	$278	$/hr
Professional IX	$278	$/hr
Technician I	$126	$/hr
Technician II	$137	$/hr
Technician III	$154	$/hr
Technician IV	$169	$/hr
Technician V	$184	$/hr
Technician VI	$203	$/hr
Technician VII	$220	$/hr
Technician VIII	$231	$/hr
Administrative I	$84	$/hr
Administrative II	$98	$/hr
Administrative III	$117	$/hr
Administrative IV	$137	$/hr
Administrative V	$158	$/hr
CAD/GIS System	$27.50	$/hr
CAD Plots - Half Size	$2.50	price per plot
CAD Plots - Full Size	$10.00	price per plot
CAD Plots - Large	$25.00	price per plot
Copies (bw) 8.5" X 11"	$0.09	price per copy
Copies (bw) 8.5" X 14"	$0.14	price per copy
Copies (bw) 11" X 17"	$0.20	price per copy
Copies (color) 8.5" X 11"	$0.90	price per copy
Copies (color) 8.5" X 14"	$1.20	price per copy
Copies (color) 11" X 17"	$2.00	price per copy
Technology Charge	2.50%	% of Direct Labor
Mileage	$0.6550	price per mile (or Current IRS Rate)
Subconsultants	15%	Cost +
Outside Services	at cost	

Rates listed are adjusted annually.