



**AGENDA
BILL
Item 7.B**

**Sudden Valley Water Treatment Plant
Architectural/Engineering Agreement
Amendment for
Alternatives Analysis**

DATE SUBMITTED:	July 1, 2020	MEETING DATE:	July 8, 2020
TO: BOARD OF COMMISSIONERS	FROM: Bill Hunter, Assist. GM/District Engineer		
GENERAL MANAGER APPROVAL			
ATTACHED DOCUMENTS	1. Scope of Work and Fee Estimate		
TYPE OF ACTION REQUESTED	RESOLUTION <input type="checkbox"/>	FORMAL ACTION/ MOTION <input checked="" type="checkbox"/>	INFORMATIONAL /OTHER <input type="checkbox"/>

BACKGROUND / EXPLANATION OF IMPACT

On November 11, 2019 the Board authorized the general manager to enter into negotiations of a professional services agreement with Gray & Osborne, Inc. (G&O) for development of the Sudden Valley Water Treatment Plant (SVWTP) Facility Improvement Plan.

The work was divided into three phases, with each phase building upon information developed from the previous step.

Phase 1 – Condition Assessment. In December 2019, the Board authorized the initial scope of work to begin. This work included a detailed conditions assessment of all components and systems by the G&O project manager, project engineer, electrical engineer, architectural/HVAC engineer, and structural engineer. This phase is nearing completion with the final report to be issued in the coming days as well as the June 24, 2020 board presentation that summarized the overall methodology, findings, and recommendations on what alternatives to explore in Phase 2.

Phase 2 – Alternatives Analysis (Capital Improvement Plan). A proposed scope of work is attached for the Board’s consideration. The scope was developed using information and recommendations documented in the Conditions Assessment.

Upon completion of this work, the District will have a documented vision and plan from which to schedule and budget capital improvements at the SVWTP for the next 20+ years. In order to make significant decisions that will have lasting impacts on customer water rates, plant reliability, and resiliency, the Board will play a key role by formally choosing the desired alternative for each major system. The intent is to fully engage the Board, as well

as provide opportunities for rate payer involvement and discussion by conducting routine consultant presentations at regular public board meetings.

The work has been broken down by major systems. For each system, G&O will develop alternatives and document each in the form of a technical memorandum. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District. Finally, G&O will provide a recommendation on modifications to system. Cost estimates for these alternatives will be provided and figures will be produced for the alternatives where feasible. These figures will be provided in sufficient detail to relay the relative space required to implement the alternative, and will highlight all required or recommended components. The results from each system analysis will be presented to the Board at regularly scheduled board meetings.

In addition to the alternatives analyses, for each of the primary components (pumps, MCCs, instruments, etc.) currently in use, the consultant will provide a risk / failure analysis. This analysis will be provided to the District in the form of a technical memorandum and will highlight the criticality of the equipment with regards to the treatment process, will identify the level of risk of failure, and will identify the consequences should the equipment fail. The risk assessment will be provided on a numerical scale so that separate treatment components / systems can be compared in order to help prioritize funds for modifications and improvements. Additionally, G&O will assist the District in preparing a project narrative summary for each of the individual items listed in Table 3-1 and Table 3-2 of the Condition Assessment report developed in Phase 1. This effort will include developing budgetary cost estimates for each line item referenced in the tables listed above.

All of the technical memoranda will be attached and summarized in an Alternatives Analysis Report.

Most of the board meeting presentations are anticipated to utilize a virtual meeting platform to eliminate consultant travel time. However, several key presentations are included for in-person presentations by G&O.

Staff is planning to facilitate coordination between G&O, a rate study financial consultant expected to begin fall 2020, and the Board to develop a 20-year capital improvement plan for the SVWTP. The rate study consultant can provide guidance on potential rate increases, recommended debt, and project timing to provide funding for the selected alternatives. Time is included for G&O to participate in a rate study public meeting to educate customers on SVWTP facility needs in tandem with the rate study consultant who can discuss proposed rate impacts.

Future Phase 3 would include design of selected alternatives.

FISCAL IMPACT

The approved 2020 Budget includes \$100,000 to begin work on the Sudden Valley Water Treatment Plant Facility Improvement Plan. In December 2019, the District authorized \$45,360 for the initial Phase 1 – Condition Assessment by G&O. Based on the findings and recommendations identified in the Condition Assessment, the proposed Phase 2 scope of work is \$114,350. The total cost for Phase 1 and proposed Phase 2 is \$159,710.

Staff recommends making up the funding shortfall by allocating \$60,000 from approximately \$273,000 of extra unallocated water funds that were carried over from 2019 to 2020. The budgeted 2019 carryover amount in Water Utility Fund 401 was \$714,000 while actual 2019 carryover in Water Utility Fund 401 ended up being \$987,000.

The recommended additional funding source is existing unallocated water capital funds, and does NOT utilize any reserve or emergency funds.

RECOMMENDED BOARD ACTION

Staff recommends that the Board authorize Amendment 1 to the Architectural/Engineering Agreement with Gray & Osborne, Inc. for the Phase 2 Alternatives Analysis (Capital Improvement Plan) which will be entirely funded by existing water capital funds contained in the 2020 Budget and supplemented by utilizing \$60,000 of \$273,000 of extra unallocated water capital funds carried over from 2019.

PROPOSED MOTION

Recommended motions are:

“I move to direct \$60,000 of the unallocated water capital funds carried over from 2019 towards the Phase 2 Alternatives Analysis (Capital Improvement Plan), for a total project budget of \$160,000.”

“I move to authorize the General Manager to execute Amendment 1 to the Architectural/Engineering Professional Services Agreement with Gray & Osborne, Inc. for the Phase 2 Alternatives Analysis (Capital Improvement Plan) for time and materials not to exceed \$114,350 as presented.”

EXHIBIT “A”

SCOPE OF SERVICES

LAKE WHATCOM WATER AND SEWER DISTRICT SUDDEN VALLEY WATER TREATMENT PLANT FACILITY IMPROVEMENT PLAN – *PHASE II: ALTERNATIVES ANALYSIS (CAPITAL IMPROVEMENT PLAN)*

PROJECT UNDERSTANDING

The Lake Whatcom Water & Sewer District (District) provides water and sewer services near Bellingham in Whatcom County, Washington. The District operates three separate, Group A Water Systems, one of which (the South Shore System) is completely served by water produced from the Sudden Valley Water Treatment Plant (WTP). The facilities that serve this system include raw water intake facilities, a water treatment plant, a storage reservoir, a finished water pumping system, and distribution system piping.

The existing WTP is located along Morning Beach Drive near the shores of Lake Whatcom and was constructed in 1972. The treatment plant utilizes chemical coagulation, flocculation, rapid media filtration, chemical pH adjustment, and gas chlorine disinfection prior to temporary storage within a 225,000-gallon reservoir also located at the WTP site.

Previously, Gray & Osborne completed an assessment of the Sudden Valley WTP in which engineers evaluated the WTP from a process, structural/architectural, mechanical, and electrical perspective. The assessment identified both high and low priority items that should be completed in order to maintain current and reliable function of the WTP. The findings and recommendations from this assessment were highlighted in the *Sudden Valley Water Treatment Plant Assessment Report* produced in July 2020.

This alternatives analysis, in conjunction with the previously completed WTP Assessment (Phase I), will help the District select and prioritize specific short- and long-term improvements to the treatment equipment and processes currently in use at the WTP. This scope of work continues the previous assessment work by providing alternative analyses to address the issues noted in Phase I.

The following scope of work and budget proposal provides a description for the Alternatives Analysis (Phase II) proposed for this phase of the project.

Using the Alternatives Analysis Report and supporting documentation proposed as part of this phase, the District can then select the most cost-effective alternative(s) and proceed with the selected modifications. Design of the selected modifications (Phase III) will be provided under a separate scope document.

SCOPE OF WORK

Task 1 – Project Management

Services shall include overall project management and oversight of the project work by the Project Manager, including the following:

- Procure sufficient staff resources to dedicate to the project;
- Manage and control project budget and schedule;
- Manage and provide monthly progress reports and invoices; and
- Coordinate the project with the District.

Deliverables

- Monthly progress reports and invoices.

Task 2 – WTP Alternatives Analysis

Subtask 2.1 – Pump Performance Test

A project manager and project engineer from Gray & Osborne will travel to the WTP and perform a pump performance test on the two existing transfer pumps and four existing finished water pumps. The performance test will include operation of each of the pumps at various flow conditions and will measure the flow, head (pressure), and amperage during each of the test phases. The data collected will be compared to the manufacturer's information to ascertain the pumps' performance.

After completion of the pump performance test, a summary technical memorandum will be produced and provided to the District. The summary memorandum will summarize the data collected during the performance testing, provide interpretation of the results, and provide recommendations for any modifications to the equipment. Any recommendations for modification to the equipment will be provided with budgetary cost estimates.

The results from the pump performance test will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the pump performance test will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft Pump Performance Technical Memorandum
- Final Pump Performance Technical Memorandum

Assumptions

- WTP operations staff will be available for the duration of the site visit to answer questions, provide information, and provide access to all facilities associated with the WTP.
- District staff will operate the pumps and valves as required to complete the testing.
- District will provide any and all existing technical information on existing pump equipment.
- If the existing pumps do not have installed amp meters, the District will provide amp meters to measure the current during operation.
- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.2 – Chemical Systems Analysis

Gray & Osborne will analyze the existing chemical addition systems, including both alum and soda ash components, and provide recommendations for dry chemical storage, bulk chemical delivery, chemical solution storage, chemical pumping, and supporting appurtenances. The investigation will include a capacity/usage analysis and various chemical alternatives for coagulation and pH adjustment will also be presented.

The investigation will be provided to the District in the form of a technical memorandum. The memorandum will include a description of the existing facilities and an analysis of alternatives for chemical delivery, solution storage, specific chemicals utilized, and chemical pumping. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District and each proposed alternative will be provided with a budgetary cost estimate. Finally, Gray & Osborne will provide a recommendation on modifications to the chemical addition system. Recommendations for modification to the equipment will be provided with budgetary cost estimates.

The results from the chemical system analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the chemical system analysis will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft Chemical System Analysis Technical Memorandum
- Final Chemical System Analysis Technical Memorandum

Assumptions

- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.3 – Disinfection Systems Analysis

Gray & Osborne will analyze the existing disinfection system including the chlorine gas disinfectant, existing CT system, and the Chlorine Contact Basin (CCB) and provide recommendations for disinfection upgrades.

The analysis will be provided to the District in the form of a technical memorandum. The memorandum will investigate alternatives for disinfection including ozone, sodium hypochlorite (both bulk and generated onsite), and gas chlorination, and will present these alternatives with their cost estimates within the memorandum. Alternatives for optimizing CT compliance will also be provided, including modification of CT calculations and expanding the CT components to include additional transmission main. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District. Finally, Gray & Osborne will provide a recommendation on modifications to the disinfection system. Recommendations for modification to the equipment will be provided with budgetary cost estimates. Figures will be produced for the alternatives where feasible. These figures will be provided in sufficient detail to relay the relative space required to implement the alternative, and will highlight all required or recommended components.

The results from the disinfection system analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the disinfection system analysis will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft Disinfection System Analysis Technical Memorandum
- Final Disinfection System Analysis Technical Memorandum

Assumptions

- District will provide all required and available record drawings for the WTP.
- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.4 – Backwash Systems Analysis

Gray & Osborne will analyze the existing backwash system, including the existing flow meter, piping, storage basin, filter backwash components, and Afternoon Beach Sewer Pump Station.

The investigation will be provided to the District in the form of a technical memorandum. The memorandum will investigate alternatives for backwash including temporary storage and recycling, discharge back to Lake Whatcom, and installing a larger settling/equalization tank. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District. Finally, Gray & Osborne will provide a recommendation on modifications to the backwash system. Cost estimates for these alternatives will be provided and figures will be produced for the alternatives where feasible. These figures will be provided in sufficient detail to relay the relative space required to implement the alternative, and will highlight all required or recommended components.

Gray & Osborne will also investigate required permits, most notably a National Pollutant Discharge Elimination System permit that would be issued by the Washington State Department of Ecology. This investigation will provide key information on whether or not discharging backwash water back to Lake Whatcom is feasible.

The results from the backwash system analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the backwash system analysis will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft Backwash System Analysis Technical Memorandum
- Final Backwash System Analysis Technical Memorandum

Assumptions

- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.5 – Filtration System Analysis

Gray & Osborne will analyze the existing filtration system, including the existing filter vessels, media type, media depth, and surface wash systems.

The investigation will be provided to the District in the form of a technical memorandum. The memorandum will investigate alternatives for granular media filtration such as rapid rate direct filtration, deep bed mono-media filtration, and membrane filtration. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District. Finally, Gray & Osborne will provide a recommendation on modifications to the filtration system. Cost estimates for these alternatives will be provided and figures will be produced for the alternatives where feasible. These figures will be provided in sufficient detail to relay the relative space required to implement the alternative, and will highlight all required or recommended components.

The results from the filtration system analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the filtration system analysis will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft Filtration System Analysis Technical Memorandum
- Final Filtration System Analysis Technical Memorandum

Assumptions

- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.6 – Tier 2/Tier 3 Seismic and Structural Analysis

A Tier 1 seismic evaluation of the Treatment Plant Building and Pump Building was completed by Gray & Osborne as part of the previously completed Phase I assessment. The Tier 1 evaluation is a checklist-style evaluation that provides quick screening for major seismic deficiencies. To develop accurate alternatives for seismic retrofit, a more detailed seismic review of the building structures and seismic bracing of equipment and utilities will be performed. This will result in a detailed list of seismic deficiencies that can be used as the basis for developing seismic retrofit alternatives. A Tier 3 evaluation per ASCE 41 Seismic Evaluation and Retrofit of Existing Buildings will be completed to develop this detailed list of deficiencies. As part of the Tier 3 evaluation, Gray & Osborne will work with the District to define the desired seismic hazard and level of building performance to use for the analysis. These can be selected to be less than, equal to, or more than the requirements of current building code, as desired by the District.

A summary of this analysis will be provided to the District in the form of a technical memorandum. The memorandum will highlight the findings of the investigation, outline the components that require additional modifications, will provide design alternatives for the modifications, and will provide budgetary cost estimates for the work associated with the modifications. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District. Finally, Gray & Osborne will provide a recommendation on seismic modifications. Cost estimates for these alternatives will be provided and figures will be produced for the alternatives where feasible. These figures will be provided in sufficient detail to relay the relative space required to implement the alternative, and will highlight all required or recommended components.

The results from the Tier 2/Tier 3 seismic analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the Tier 2/Tier 3 seismic system analysis will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft Tier 2/Tier 3 Summary Technical Memorandum
- Final Tier 2/Tier 3 Summary Technical Memorandum

Assumptions

- WTP operations staff will be available for the duration of the site visit to answer questions, provide information, and provide access to all facilities associated with the WTP.

- District will provide all required and available record drawings for the WTP.
- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.
- Provide input on level of desired seismic resiliency.

Subtask 2.7 – Structural/Architectural Workspace Analysis

Gray & Osborne will complete an analysis of the existing structure and workspace and provide recommendations for upgrades or improvements.

The analysis will be provided to the District in the form of a technical memorandum. The memorandum will investigate alternatives for modifications to the existing structures based on the findings from the Tier 1, Tier 2, and Tier 3 Seismic analysis as well as the WTP Assessment Report. Additionally, the memorandum will highlight alternatives for work-and storage-space within the WTP. The alternatives will be compared and ranked using a decision matrix based on various selection criteria chosen by the District. Finally, Gray & Osborne will provide a recommendation for modifications. Recommendations for modification to the equipment will be provided with budgetary cost estimates. Figures will be produced for the alternatives where feasible. These figures will be provided in sufficient detail to relay the relative space required to implement the alternative, and will highlight all required or recommended components

The results from the structural/architectural workspace, as well as the Tier 2 and Tier 3 Seismic Analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the structural/architectural workspace analysis will also be presented to the District’s Board at a regularly scheduled Board meeting.

Deliverables

- Draft Structural/Architectural Workspace Analysis Technical Memorandum
- Final Structural/Architectural Workspace Analysis Technical Memorandum

Assumptions

- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.8 – NACE III Coating Inspection

Gray & Osborne will facilitate and coordinate an inspection of the coating systems for the CCB. A project engineer Gray & Osborne will visit the WTP site, will provide a preliminary inspection, and will adhere coating testing dollies to the tank sidewall. From there, a subconsultant, Evergreen Coating Engineers LLC, will travel to the WTP and complete the testing and inspection on the exterior and interior coatings of the CCB. The inspection will include both a visual inspection, coating thickness measurements, and adhesion testing.

After the inspection, Evergreen Coatings will provide a summary technical memorandum which highlights the inspection process, provides a summary of the results of the inspection, and provides recommendations on the remaining service life of the existing coatings. A cost estimate to prepare and recoat the CCB will also be included.

The results from the coating system analysis will also be summarized in the proposed Alternatives Analysis discussed in Subtask 2.10 below and the technical memorandum will be included as an appendix to the Alternatives Analysis Report. The results from the coating system analysis will also be presented to the District's Board at a regularly scheduled Board meeting.

Deliverables

- Draft CCB Coating Inspection Report
- Final CCB Coating Inspection Report

Assumptions

- WTP operations staff will be available for the duration of the site visit to answer questions, provide information, and provide access to all facilities associated with the WTP.
- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- Presentation to the Board will be via GoToMeeting, Teams, Zoom or other virtual software platform.

Subtask 2.9 – Risk Assessment and Project Prioritization

For each of the primary components (pumps, MCCs, instruments, etc.) currently in use at the WTP, Gray & Osborne will provide a risk/failure analysis. This analysis will be provided to the District in the form of a technical memorandum and will highlight the criticality of the equipment with regards to the treatment process, will identify the level of risk of failure, and will identify the consequences to the WTP should the equipment fail. The risk assessment will be provided on a numerical scale so that separate treatment

components/systems can be compared in order to help prioritize funds for WTP modifications and improvements.

Additionally, Gray & Osborne will assist the District in preparing a project narrative summary for each of the individual items listed in Table 3-1 and Table 3-2 of the previously provided WTP Assessment Report. Table 3-1 and Table 3-2 are attached as Exhibit C. This effort will include developing budgetary cost estimates for each line item referenced in the tables listed above.

Deliverables

- Draft Risk Assessment Summary
- Draft Project Narrative Summaries
- Final Risk Assessment Summary
- Final Project Narrative Summaries

Assumptions

- District will assist Gray & Osborne with format and developing the desired level of detail for both the risk assessment and project narrative summaries.

Subtask 2.10 – Draft Alternatives Analysis Report

Gray & Osborne will provide the District with a Draft Alternatives Analysis Report.

- The report will include the following items:
 - Executive Summary
 - Summarize the findings of the report
 - Introduction
 - State the purpose and goals for the report
 - Background Information
 - Briefly describe the District’s water treatment facilities
 - Briefly describe the work to date and conclusions from the WTP Assessment Report
 - Alternatives Analysis
 - Provide alternatives analysis for specific treatment system components (i.e., backwash, disinfection, etc.)
 - Provide a risk analysis for the existing systems
 - Compare and contrast the cost for modifications to the cost of a new water treatment facility elsewhere within the District boundary

- Summary and Conclusions
 - Summarize the findings of the report and required modifications, and provide summary of details and costs.
- Recommendations
 - Provide prioritized recommendations for modifications.
 - Provide schedule and sequencing considerations.
- Appendices
 - Provide each of the summary technical memoranda or reports listed in Subtasks 2-1 through 2-8 above.

The Draft Alternatives Analysis Report will be provided to the District in electronic (.pdf) format.

Deliverables

- Draft Alternatives Analysis Report
- Final Alternatives Analysis Report

Assumptions

- District will provide review and comment on Draft documents within 14 calendar days from receipt.
- The District will provide all available record drawings will be provided to G&O.
- Water system modeling is not included in this scope.
- The current Water System Plan (*Wilson Engineering, 2018*) will be used to identify historical and projected demands, if necessary.
- Design of selected alternatives will be provided under a separate scope of work.

Subtask 2.11 – Draft Alternatives Analysis Meeting

A project manager and project engineer from Gray & Osborne will attend one Draft Alternatives Report review meeting at the District’s office in Bellingham, Washington. At this meeting, G&O will discuss District review comments on the Draft Alternatives Analysis Report with District staff.

Subtask 2.12 – Final Alternatives Analysis Report

Gray & Osborne will incorporate the District’s review comments on the Draft Alternatives Analysis Report and provide the District with a final, revised Alternatives Analysis Report.

The Alternatives Analysis Report will be provided to the District in electronic (.pdf) format.

Subtask 2.13 – Alternatives Analysis Board Presentation

Gray & Osborne will prepare an electronic (.ppt) presentation that highlights the process, conclusions, recommendations, and cost estimates identified in the alternatives analysis. A draft presentation will be provided for District review prior to the presentation, and any comments from the District on the presentation materials will be incorporated into the final documents.

A project manager and project engineer will present this information at the District's office in Bellingham, Washington during a regularly scheduled Board meeting.

Deliverables

- Draft District board presentation slides.
- Final District board presentation slides.

Subtask 2.14 – Financial Analysis Board Meeting

A project manager and project engineer will attend a regularly scheduled Board meeting or workshop at the District's office in Bellingham, Washington. Gray & Osborne will provide supplemental information and answer questions regarding the work highlighted above with regards to the proposed rate study set to begin in fall of 2020.

Assumptions

- Gray & Osborne will offer Q&A support only and no presentation materials will be provided.

Task 3 – Quality Assurance/Quality Control

Oversee quality assurance/quality control (QA/QC) meetings at our Seattle office during the course of the project. The meetings will be on an as-needed basis, and this task will also include review of written reports and technical memoranda by senior project staff. After each of these meetings and/or reviews, the project engineer will ensure incorporation of relevant recommendations and suggestions into the final version of the documents.

SCHEDULE FOR COMPLETION

To complete the work detailed in the scope listed above in a timely fashion, the following schedule is proposed:

Contract Execution.....	July 2020
Notice to Proceed (NTP).....	July 2020
Complete Summary Technical Memoranda	August 2020 thru January 2021
Complete DRAFT WTP Alternatives Analysis	February 2021
District Revision Meeting	March 2021
Complete FINAL WTP Alternatives Analysis	April 2021
District/Board Presentation.....	May 2021

Adjustments to the schedule above may be required based on document review times, availability of water quality data, District staff availability, and other factors. The District will be notified immediately if any deviations from the schedule above will be required.

PROPOSED FEE SCHEDULE

Based on the Scope of Work described above, the estimated cost is \$114,350 as shown in attached Exhibit “B.”

EXHIBIT "B"

**ENGINEERING SERVICES
SCOPE AND ESTIMATED COST**

**LAKE WHATCOM WATER & SEWER DISTRICT - SUDDEN VALLEY WATER TREATMENT PLANT FACILITY IMPROVEMENT PLAN
PHASE 2: ALTERNATIVES ANALYSIS (CAPITAL IMPROVEMENTS PLAN)**

Tasks	Principal Hours	Project Manager Hours	Project Engineer Hours	Architectural / HVAC Engineer Hours	Structural Engineer Hours	Electrical Engineer Hours	Engineer-In-Training Hours	AutoCAD/GIS Technician Hours
Task 1: Project Management								
Project Management		24	4					
Task 2: WTP Alternatives Analysis								
2.1 - Pump performance test		10	20					
2.2 - Chemical Systems Analysis	1	4	32	8	8	8	8	32
2.3 - Disinfection Systems Analysis	1	4	40	4		4	8	32
2.4 - Backwash Systems Analysis	1	4	32	4	4	8	8	48
2.5 - Filtration System Analysis	1	4	24					16
2.6 - Tier 2 / Tier 3 Seismic Analysis			2		32			
2.7 - Structural / Architectural Workspace Analysis	1	2	40	24	16	8		48
2.8 - NACE III Coating Inspection			8					
2.9 - Risk Assessment and Project Prioritization		1	16					
2.10 - Draft Alternatives Analysis Report		4	32			4	20	32
2.11 - Draft Alternatives Analysis Meeting		2	8					
2.12 - Final Alternatives Analysis Report	2	2	8					8
2.13 - Alternatives Analysis Board Presentation		8	16					
2.14 - Financial Analysis Board Meeting		6	6					
Task 3: Quality Assurance / Quality Control								
Quality Assurance / Quality Control	4	8	16	6	6	6	8	
Hour Estimate:	11	83	304	46	66	38	52	216
Fully Burdened Billing Rate Range:*	\$135 to \$200	\$119 to \$200	\$119 to \$148	\$105 to \$148	\$110 to \$167	\$120 to \$190	\$85 to \$133	\$50 to \$132
Estimated Fully Burdened Billing Rate:*	\$175	\$165	\$140	\$140	\$165	\$170	\$100	\$105
Fully Burdened Labor Cost:	\$1,925	\$13,695	\$42,560	\$6,440	\$10,890	\$6,460	\$5,200	\$22,680

Total Fully Burdened Labor Cost: \$ 109,850
 Direct Non-Salary Cost:
 Mileage & Expenses (Mileage @ current IRS rate) \$ 650
 Subconsultant:
 Evergreen Coating Engineers \$ 3,500
 Subconsultant Overhead (10%) \$ 350
TOTAL ESTIMATED COST: \$ 114,350

* Actual labor cost will be based on each employee's actual rate. Estimated rates are for determining total estimated cost only. Fully burdened billing rates include direct salary cost, overhead, and profit.

EXHIBIT C

SUPPLEMENTAL INFORMATION

TABLE 3-1

SUDDEN VALLEY WTP HIGH PRIORITY MODIFICATIONS SUMMARY

Modification	Location ⁽¹⁾	Discipline ⁽²⁾
Conduct chlorine disinfection system alternatives analysis	MB	P
Chlorine gas system modifications	MB	P
Alum storage and metering pump system modifications	MB	P
Soda Ash storage and metering pump system modifications	MB	P
Conduct backwash system alternatives analysis	MB	P
Replace existing clearwell and CCB level switch	MB	P
Replace corroded steel supports	MB	S
Prepare and coat steel tanks (Floc, Soda Ash, and Filters 1/2)	MB	S
Install seismic bracing for electrical conduit, electrical equipment, and treatment equipment	MB/FPB	S
Complete detailed structural evaluation	MB/FPB	S
Relocate existing laboratory electrical equipment	MB	A
Remove soil cover, vegetation growth, and organic debris from building exterior and roof	MB	A
Provide water upgrades to safety shower and eyewash	MB	A
Investigate current heating schedule	MB/FPB	M
Combine all existing plant records into a single as-built planset	MB/FPB	E
Complete a comprehensive electrical system audit	MB/FPB	E
Remove chemicals and metering equipment away from MCCs	MB	E
Review historical peak demand electrical consumption	MB/FPB	E
Replace MCC1 and MCC2 with new, current technology	MB/FPB	E
Replace MCC3 to address panel and interior component corrosion	MB	E

(1) MB = WTP Main Building. FPB = Finished Water Pump Building. CCB = Chlorine Contact Basin.

(2) P = Process, S = Structural, A = Architectural, M = Mechanical, and E = Electrical.

TABLE 3-2**SUDDEN VALLEY WTP RECOMMENDED MODIFICATIONS SUMMARY**

Modification	Location⁽¹⁾	Discipline⁽²⁾
Modify/repair existing flocculation tank	MB	P
Provide new grout floor within raw water pump pit	MB	P
Drain and clean the clearwell	MB	P
Procure spare backwash flow meter	MB	P
Procure dedicated confined space equipment for the WTP	MB	P
Install additional access ladder to Filters 1 and 2 and Filters 3 and 4	MB	P
Revise CT calculations to include clearwell and BE of 0.1	MB	P
Revise piping and conduit above flocculation tank	MB	P
Provide additional Operator In Trouble alarming equipment	MB/FPB	P
Replacing existing tube-style level alarm at flocculation tank	MB	P
Procure a spare finished water pump motor	FPB	P
Replace existing pressure gauges	FPB	P
Improve the visibility of the existing clearwell hatch	MB	P
Complete a performance test of the raw water, transfer, and finished water pumps	MB/FPB	P
Prepare and coat exposed ceiling rebar	MB	S
Address deficiencies found in 2016 seismic report	CCB	S
Perform formal CCB coating inspection	CCB	S
Address deteriorating conditions in restroom	MB	A
Investigate additional site security measures	MB/FPB	A
Remove heavy organic debris from roof	FPB	A
Repair wall seepage above MCC3	MB	A
Repair seepage/leaks at storefront window assemblies	MB	A
Modify floor to promote drainage to existing trench drain	MB	A
Revise existing storefront window to provide larger door opening	MB	A
Relocate stored filter media and other supplies equipment	MB	A
Conduct energy and heat audit	MB/FPB	M
Repair crack in generator exhaust piping	FPB	M
Conduct annual load testing for existing generator	FPB	E
Replace existing fluorescent light fixtures with LED equipment	MB/FPB	E
Replace AC backed system with DC backed systems	MB/FPB	E
Consolidate existing electrical panelboards	MB/FPB	E
Reroute floor mounted electrical conduit	MB/FPB	E
Reroute field wiring within grey/blue wall mounted panels	MB	E
Modify transfer pump pad based on long-term operations strategy	MB	E
Fuel tank relocation investigation	FPB	E

(1) MB = WTP Main Building. FPB = Finished Water Pump Building. CCB = Chlorine Contact Basin.

(2) P = Process, S = Structural, A = Architectural, M = Mechanical, and E = Electrical.