EXHIBIT A
Scope of Work
City of Snoqualmie
Water System Plan, General Sewer and Wastewater Facilities Plan, and Stormwater System Plan Updates

February 2018

Background

The City of Snoqualmie (City) is a municipal corporation that is responsible for providing sanitary sewer, water, and stormwater service to its service areas within east King County. The City provides services to areas within the City limits and areas of unincorporated King County, as well as Tribal sovereign land.

This Scope of Work includes tasks necessary to update the City's Water System Plan (WSP), General Sewer and Wastewater Facilities Plan (GSP), and the Stormwater System Plan (SWP). The plan updates will evaluate the ability of the City's utility systems to meet the needs of existing and currently projected future customers throughout the 20-year planning period.

Available resources from the previous planning work will be utilized to reduce the level of effort necessary for these utility plan updates. Attached as **Exhibit B** is a list of data to be provided by the City prior to commencement of the activities contained in this Scope of Work. RH2 Engineering, Inc., (RH2) will use and rely upon the data, information, and materials prepared or provided by the City or others. It is anticipated that all three utility plans will be completed concurrently. Efficiencies related to these joint planning efforts are reflected in the Scope of Work and Fee Estimate. Unless otherwise noted, deliverables will be provided in electronic format.

Deliverables will be provided in MS Word, PDF, and Geographical Information System (GIS) format as appropriate and requested by the City.

TASKS FOR COORDINATING ALL UTILITY PLANS

Task 1 – COORDINATING ALL UTILITY PLANS

Task 1.1 – Project/Team Management

Objective: Manage the RH2 project team, files, and records. Monitor the scope and budget.

Approach:

1.1.1 Prepare, monitor, and update the project schedule on a monthly basis.

1.1.2 Review work performed for consistency with this Scope of Work, monitor budget, prepare monthly invoices, and provide City staff with monthly briefing via email for the eighteen (18)-month schedule.

1.1.3 Maintain project records.

1.1.4 Manage the utility planning team and subconsultants. Prepare and execute subconsultant contracts.

RH2 Deliverables:

- Invoice documenting monthly progress of work completed and earned value compared to contract value.
- Project records maintained and filed.
- Utility planning team and subconsultant coordination.

Task 1.2 – Agency Coordination

Objective: Coordinate with the Washington State Department of Health (DOH), the Washington State Department of Ecology (Ecology), King County (County), and Tribes during the development of the utility plans.

Approach:

1.2.1 Attend a project kick-off meeting with the City for each utility plan to be updated. *It is assumed that three (3) RH2 or NHC staff will attend each utility plan meeting.*

1.2.2 Coordinate and attend a WSP pre-planning conference with City, County, and DOH staff. *It is assumed that two (2) RH2 staff will attend this meeting.*

1.2.3 Coordinate and attend a GSP pre-planning conference with City and Ecology staff. *It is assumed that three (3) RH2 staff will attend this meeting.*

1.2.4 Provide coordination with DOH, Ecology, the County, and Tribes. *This task is assumed to be limited to a total of sixteen (16) hours for phone calls and email correspondence with stakeholders.*

RH2 Deliverables:

- Attendance at the project kick-off meeting with the City for each utility plan.
- Coordination and scheduling for pre-planning conferences with the County, DOH, and Ecology.
- Coordination with DOH, Ecology, the County, and Tribes.
- Meetings minutes for kick-off meeting and pre-planning conferences to be provided via email to meeting participants.

Task 1.3 – Data Collection and System Inventories

Objective: Assist the City in collecting data and inventories for the water, sewer, and stormwater system planning process. Review the data and inventories for use in developing the plans.

Approach:

1.3.1 Prepare and submit the list of data and mapping needs for each utility (**Exhibit B**).

1.3.2 Review data and maps provided by the City and develop an inventory of each utility for use during the plan updates.

1.3.3 Coordinate with City staff during the data collection process for each utility.

1.3.4 Based on review of records, field investigations, and discussions with City maintenance staff, determine if there are areas of the existing utility systems with critical data gaps that require field survey, video inspection, or other investigations.

Assumptions:

- *The City will provide data and maps requested in the* **Exhibit B** *data request within ten (10) weeks of contract execution.*
- *The City will provide additional investigations and/or video inspection of utility systems if required.*

RH2 Deliverables:

- Compilation and review of data and maps provided by the City.

Task 1.4 – Land Use and Population

Objective: Review planning-related documents and develop population projections to identify their impacts on the City's water, sewer, and stormwater systems.

Approach:

1.4.1 Prepare and review an inventory of related plans to provide a summary of the impacts or constraints on the utility systems for the County's Comprehensive Plan Land Use Elements, the *King County Coordinated Water System Plan*, the City's *Comprehensive Plan*, and the Growth Management Act (GMA).

1.4.2 Complete DOH's Consistency Statement Checklist for each planning agency that the WSP must be consistent with, including local and county planning jurisdictions.

1.4.3 Identify existing and projected future land use patterns in and adjacent to the City and their impacts on existing and proposed future facilities. Specifically, identify the impacts to water sources for the water system and proposed large development projects.

1.4.4 Identify current and projected housing trends and household sizes within the City's service areas based on available information and population data from City staff.

1.4.5 Develop a table of 10-year and 20-year population projections for both the City and utility service areas that comply with the GMA.

1.4.6 Meet with the City to confirm future land use condition and impervious area assumptions.

1.4.7 Prepare a color figure of the City's land use for use in each utility plan.

RH2 Deliverables:

- Consistency Statement Checklists for planning agencies.
- Land use and population text and color figure for use in the associated chapter of each utility plan.
- One (1) meeting to confirm future land use condition and impervious area assumptions.

Task 2 – WATER SYSTEM PLAN

The following tasks are specific to the WSP update.

Task 2.1 – Introduction and Existing System Description

Objective: Provide a description of each component of the existing water system.

Approach:

2.1.1 Prepare a description of the water system, ownership, and management. Include the system type, system identification number, address, and contact person.

2.1.2 Prepare a description of the authorization and purpose of the WSP.

2.1.3 Prepare a summary of the WSP contents.

2.1.4 Prepare a list of definition of terms and a list of abbreviations used in the WSP.

2.1.5 Review previous plans, existing system information and data, and facility as-builts.

2.1.6 Visit each facility with City staff to collect field information, observe equipment layouts and existing conditions, and obtain maintenance staff input/complaints regarding the existing water system.

2.1.7 Provide a brief overview of the history of the water system using information from the previous WSP and historical summaries compiled and provided by the City. Include the current numbers of existing and approved service connections.

2.1.8 Describe the physical characteristics of the existing water service area and its effects on water system planning, including topography, geology, and sensitive areas and flood zones.

2.1.9 Describe the City's existing and planned future service areas, including the Urban Growth Area, retail water service area, and water service agreements.

2.1.10 Summarize the Satellite Management Agency program, its potential impacts on the City, and the City's policy toward satellite management.

2.1.11 Prepare a brief overview of the operation of the existing water system.

2.1.12 Prepare a description of each pressure zone and the existing facilities, including sources of supply, pressure reducing stations, booster pump stations, pipelines, reservoirs, interties, and the telemetry and supervisory control system.

2.1.13 Prepare a table of water main inventory that includes total lengths, diameters, materials, and age based on available data.

2.1.14 Review adjacent water systems and provide a brief description of the adjacent water systems and the potential for emergency interties.

2.1.15 Prepare color figures of the following.

- Existing Water System
- Existing System Hydraulic Profile
- Service Area and Adjacent Systems

RH2 Deliverables:

- Descriptions and figures of existing system components for City review and comment.
- Attendance at one (1) facility visit with City staff.
- Color figures of the Existing Water System, Existing System Hydraulic Profile, and Service Area and Adjacent Systems.

Task 2.2 – Water Demands

Objective: Review historical water use and forecast projected water demands of the system.

Approach:

2.2.1 Identify criteria and procedures to be used for issuing Certificates of Water Availability in accordance with the GMA.

2.2.2 Tabulate monthly totals of metered consumption for each customer class and the average number of accounts in service for each year from 2011 through 2016 based on available information provided by the City. Identify the seasonal variations in consumption for each customer class.

2.2.3 Tabulate ten (10) to twenty (20) of the largest water users and the total water use of each for the year 2016.

2.2.4 Tabulate monthly and yearly totals of water supply from each supply facility from 2003 through 2016.

2.2.5 Calculate per capita demands based on the average day demand (ADD) and water system population data from 2011 through 2016.

2.2.6 Calculate the number of equivalent residential units (ERUs) within the system based on the water consumption and supply data.

2.2.7 Review the total amount of distribution system leakage from 2011 through 2016 and coordinate with the City to determine inconsistencies in billing system and meter data. Calculate the 3-year rolling average of distribution system leakage.

2.2.8 Tabulate total consumption of customers within each pressure zone based on the hydraulic model and the parcel-consumption database provided by the City.

2.2.9 Calculate the system ADD based on the yearly water supply data from 2011 through 2016.

2.2.10 Estimate the system's maximum day and peak hour demands.

2.2.11 Prepare a table of general fire flow requirements for each land use classification and identify buildings with the largest fire flow requirements within the service area.

2.2.12 Document the historical demands from 2011 through 2016.

2.2.13 Document the current and past efforts for water use efficiency and their impact on water demand over the past ten (10) years. Describe the water use efficiency improvements.

2.2.14 Develop 1-, 2-, 3-, 4-, 5-, 6-, 7-, 8-, 9-, 10-, and 20-year, and buildout demand projections based on projected water system population data and historical per capita demands. *Demand projections shall be tabulated with and without additional water use reductions from the proposed water use efficiency program.*

2.2.15 Describe the basis for and results of the existing and projected water demand evaluation.

2.2.16 Evaluate, describe, and prepare a graphic or table to demonstrate the seasonal variations in consumption patterns for each customer class.

2.2.17 Prepare tables summarizing the results of the demand analyses and integrate the tables within the chapter text.

Assumptions:

- *Buildout projections will be based on developable land use analysis provided by the City.*

RH2 Deliverables:

- Descriptions and tables of historic and projected demand data for City review and comment.

Task 2.3 – Regulations, Policies, and Design Criteria

Objective: Review existing policies and design criteria and recommend, as necessary, changes to these policies so that planned facilities can meet design standards.

Approach:

2.3.1 Review existing City standards pertaining to water system policies and criteria.

2.3.2 Identify existing policies and recommend additional or revised policies as necessary so that planned future City facilities can meet minimum and acceptable design standards and criteria. Use DOH, U.S. Environmental Protection Agency, American Water Works Association, and standard engineering practices as the basis for identifying policies, criteria, and requirements.

2.3.3 Summarize each policy and design criteria.

2.3.4 Review the City's existing construction standards and include a copy in an appendix of the WSP.

2.3.5 Describe the process for responding to requests for new water service (individual and group services), including timeframes.

2.3.6 Describe the process for determining if the system's capacity is adequate to provide water service requests for new service. *The process must include the determination of sufficient water rights.*

2.3.7 Describe conditions of a non-technical nature that may impact the ability to provide new water service (e.g., annexation procedures, local ordinances, instream flow rule, etc.).

2.3.8 Describe the procedures for granting or requesting extensions of time during a project. Describe the procedures for handling disputes and appeals when requests are denied.

2.3.9 Describe policies for extensions of water service outside of service area boundaries. Describe how the policies are consistent with local and County comprehensive land use plans and development regulations.

RH2 Deliverables:

- Descriptions of policies and design criteria for City review and comment.

Task 2.4 – Water Source and Quality

Objective: Identify the City's water quality monitoring requirements and results of recent monitoring, and prepare an inventory of existing water sources and water rights.

Approach:

2.4.1 Provide a detailed description of the existing water sources and treatment.

2.4.2 Document the City's long-term water supply planning efforts.

2.4.3 Summarize the City's current water rights utilizing information contained in report(s) prepared by Aspect Consulting for the City during recent water right planning efforts.

2.4.4 Perform a water rights evaluation that compares current water rights with existing and projected demands. The buildout scenario will be used for the future water rights planning. *The City and Aspect*

Consulting are currently working on acquiring additional water rights. Acquisition of new water rights will impact the comparison and the City and Aspect Consulting will provide information if/when additional rights are obtained.

2.4.5 Document water supply characteristics and foreseeable effects from existing and projected water use on the water quantity and quality of the bodies of water from which the City withdraws supply. Describe water supply characteristics by identifying seasonal source variability, water rights limitations, water reliability, and legal constraints. Utilize existing data and studies available from the City.

2.4.6 Provide an overview of existing and known future Environmental Protection Agency (EPA) drinking water regulations and the Safe Drinking Water Act (SDWA). Describe the impacts of the regulations on the City.

2.4.7 Identify the water quality monitoring requirements for the City's water system.

2.4.8 Summarize the results and compliance status of recent source and distribution system water quality monitoring.

2.4.9 Identify improvements, as needed, to comply with the water quality requirements.

2.4.10 Provide tables summarizing the results of the water source analyses and integrate the tables within the chapter text. Update information from the previous WSP as necessary.

RH2 Deliverables:

- Evaluation of existing water rights and existing water quality monitoring requirements, and results of recent monitoring for City review and comment.

Task 2.5 – Hydraulic Model Update and Calibration

Objective: Update and calibrate the hydraulic model of the City's existing water system.

Approach:

2.5.1 Convert the City's existing H2ONet hydraulic model to Bentley WaterGEMS and update the model with recent water system improvements based on the City's comments and GIS data. Review the model with current water system mapping for consistency and completeness. *It is assumed that limited updates are needed to update the hydraulic model with projects completed within the last two (2) years.*

2.5.2 Review facility as-builts and update the model as necessary to reflect the existing piping and equipment layout and facility minor losses.

2.5.3 Coordinate with the City to review the operational setpoints and controls for facilities included in the model and update the model based on input from the City.

2.5.4 Update elevation data in the model by transferring data from electronic contours to model junction nodes.

2.5.5 Input the current land use classifications into the model and assign a general planning-level fire flow requirement to each node for comparison of fire flow results.

2.5.6 Compute pipe roughness coefficients from available pipe material and age data to accomplish initial calibration.

2.5.7 Using a parcel-consumption database provided by the City, allocate the demand data among the nodes in the model.

2.5.8 Perform preliminary hydraulic analyses to identify locations for field pressure and hydrant flow tests and check potential performance at each site. Prepare a template that lists field test locations and data that needs to be collected at each test location. Coordinate with the City to confirm methods and recordkeeping for field tests.

2.5.9 Attend the hydrant flow tests to review the pressure and flow test objectives for the purpose of calibrating the hydraulic model. *The Fee Estimate includes two (2) RH2 staff members for sixteen (16) field hours each. City staff will operate hydrants, valves, and other water system facilities as directed by RH2. RH2 will provide calibrated pitot and pressure gauges for use during the hydrant flow tests and record the results of the tests. Operational status of facilities will be provided by City staff (from the City's telemetry system following field testing), including flows into the system from supply sources and reservoir levels at the start and end of the tests.*

2.5.10 Perform hydraulic analyses to calibrate the model from the field flow and pressure test data for the purposes of steady-state hydraulic analyses.

2.5.11 Coordinate with the City to identify the source of inconsistencies between the field calibration data and the modeled results for the steady-state calibration. *Inconsistencies may be the result of unknown closed valves in the system or incorrect diameter of water main shown on system mapping or as-builts. Since this item is highly variable in nature, an initial allocation of thirty-two (32) hours of a water modeling specialist's time has been included for this task. If generally accepted industry standards for hydraulic model accuracy cannot be achieved within this initial allocation, RH2 will coordinate with the City to determine the next steps. This may include a scope amendment to assist the City in completing additional field flow tests and model calibration analyses.*

RH2 Deliverables:

- Attendance at field hydrant flow tests.
- Calibrated WaterGEMS hydraulic water model for use in steady-state hydraulic analyses.
- Coordination with City via email and phone correspondence to review the hydraulic water model.

Task 2.6 – Water System Analyses

Objective: Evaluate the water system to identify deficiencies and recommend improvements. Utilize the hydraulic model of the City's water system to perform hydraulic analyses.

Approach:

2.6.1 Examine each of the existing pressure zones and identify areas of low and high pressures. Include a table showing each existing zone, its maximum and minimum service elevation, and service pressures (at static conditions).

2.6.2 Calculate the quantity of water supply required for the existing and projected conditions, and compare those requirements to the system's existing supply capability.

2.6.3 Analyze South Wellfield chlorination demands and existing chlorination infrastructure. Perform bench scale chlorination testing on a sample of South Wellfield water to identify chlorination demands. Review the capacity of the existing South Wellfield Treatment Facility's chlorination

system and assess detention time from the chlorination point to the first customer. Recommend chlorination system and contact time pipeline improvements.

2.6.4 Identify and describe supply facility deficiencies and summarize the results of Aspect Consulting's source capacity improvements study.

2.6.5 Based on the requirements contained in Washington Administrative Code 246-290-235 and the most current DOH *Water System Design Manual*, calculate the quantity of water storage required for the existing and planned future system and compare those requirements to the existing storage capacity of the system. Include an analysis of reclaimed water storage.

2.6.6 Identify and briefly describe storage deficiencies.

2.6.7 Document the hydraulic analysis criteria and hydraulic model settings for the distribution system analyses.

2.6.8 Using the hydraulic model of the water system, perform a steady-state hydraulic analysis of the system simulating a peak hour demand (PHD) condition with no fire flows to determine the pressures and flow distribution during this demand condition.

2.6.9 Perform a steady-state fire flow analysis for each node in the system while simulating maximum day demands (MDD) to determine the capability of the existing system to provide adequate flows and pressures and identify existing system deficiencies.

2.6.10 Input projected demand data into the hydraulic model's nodes using the results from the projected water demand evaluation. Demand distribution shall be based on estimates of projected growth allocations.

2.6.11 Based on the results of the existing system hydraulic analysis and identification of deficiencies, identify and input proposed water system improvements into the model.

2.6.12 Perform a steady-state fire flow analysis for each node in the system while simulating projected maximum day demands to review whether the proposed improvements can eliminate existing system deficiencies and are sized properly to accommodate anticipated growth based on meeting the City's policies and design criteria. Repeat the analyses for the 10-year and 20-year projections until existing system deficiencies have been eliminated.

2.6.13 Identify and describe distribution system deficiencies and the results of the hydraulic analyses.

2.6.14 Review and discuss known existing system deficiencies and unsuitable pipe materials from data provided by the City.

2.6.15 Evaluate the City's existing pressure reducing stations and identify deficiencies.

2.6.16 Evaluate the City's existing interties and identify deficiencies.

2.6.17 Evaluate the City's existing booster pump stations and identify deficiencies.

2.6.18 Evaluate the City's existing telemetry and supervisory control system and identify deficiencies.

2.6.19 Perform an existing system capacity analysis and a 10-year projected system capacity analysis to determine the unused, available system capacity expressed in ERUs. Prepare a 10-year projected system capacity analysis with proposed improvements. Document the criteria and results of the analyses.

2.6.20 Meet with City staff to discuss the system analyses, deficiencies, and recommended improvements. *It is assumed that two (2) RH2 staff will attend this meeting.*

2.6.21 Provide tables summarizing the results of the system analyses and integrate them within the chapter text.

2.6.22 Prepare color figures of the following.

- Hydraulic Model Node Diagram
- Existing System PHD Pressure
- 20-year PHD Pressure without Improvements
- Existing System Available Fire Flow
- 20-year Available Fire Flow without Improvements

RH2 Deliverables:

- Descriptions, tables, and figures of water system analyses for City review and comment.
- Attendance at one (1) meeting with City staff. Meetings minutes will be provided via email to meeting participants.

Task 2.7 – Operations and Maintenance

Objective: Document the water system's operations and maintenance program for use in the WSP.

Approach:

2.7.1 Evaluate staffing requirements and document recommendations.

2.7.2 Obtain the Operations and Maintenance chapter from the City and incorporate staffing requirements. Review, format, and finalize the chapter for incorporation into the WSP.

RH2 Deliverables:

- Evaluation and recommendations of staffing requirements.
- Incorporation of the City's existing operations and maintenance program into the WSP.

Task 2.8 – Capital Facilities Plan

Objective: Describe, prioritize, and schedule improvements to address deficiencies identified in the water system analyses. Prepare planning-level cost estimates for each project identified. Combine schedule and cost estimates into an overall Capital Facilities Plan (CFP) for the water utility.

Approach:

2.8.1 Briefly describe water system improvements that have been completed since the last WSP update.

2.8.2 Prepare a list of proposed water system improvements based on the results of the existing system and proposed system analyses. Include recommendations from Aspect Consulting's source capacity improvement study. Briefly describe each group of related improvements and the purpose/benefit of the improvements.

2.8.3 Review and make recommendations, as necessary, for changes to the City's existing standards for system replacements, rehabilitations, and extensions.

2.8.4 Prepare a planning-level approximate cost estimate for each improvement based on current industry prices.

2.8.5 Coordinate with City staff to establish criteria for prioritizing and scheduling improvements. Prioritization and scheduling will consider other scheduled projects based on information provided by the City and the CFPs developed for transportation and other utilities.

2.8.6 Schedule improvements based on the results of the prioritization.

2.8.7 Prepare a table of improvements that includes an improvement identification number, a brief description of each improvement, the associated cost estimate, and the scheduling of the improvements on an annual basis for the first 10 years and for the 20-year planning period.

2.8.8 Describe the criteria and procedures used for prioritizing and scheduling improvements.

2.8.9 Provide tables documenting the development of the capital facilities plan and integrate them within the chapter text.

2.8.10 Prepare color figures of the following.

- Proposed Water System Improvements
- 20-year PHD Pressure with Improvements
- 10-year Available Fire Flow with Improvements
- 20-year Available Fire Flow with Improvements
- Proposed Improvements Hydraulic Profile

2.8.11 Prepare GIS files of the existing system and proposed CIP for transmittal to the City. *GIS layers will include a field to indicate flushing status and date for each pipe.*

2.8.12 Prepare CFP fact sheets for up to twenty (20) individual water projects.

2.8.13 Meet with City staff to discuss the water system improvements and the proposed schedule of implementation. *It is assumed that two (2) RH2 staff will attend this meeting.*

RH2 Deliverables:

- Draft CFP tables, fact sheets, and figures for City review and comment.
- Two (2) printed copies of up to twenty (20) CFP fact sheets.
- GIS files of the existing system and proposed CIP.
- Attendance at one (1) meeting with City staff. Meeting minutes will be provided via email to meeting participants.

Task 2.9 – Financial Analysis

Objective: Coordinate with FCS Group, who will prepare a financial analysis of the existing and projected future water utility. The City will contract directly with FCS Group for these services.

Approach:

2.9.1 Coordinate with FCS Group during the project and attend one (1) phone conference to provide information in support of the financial analysis chapter to be prepared by FCS Group.

2.9.2 Review the financial chapter produced by FCS Group, format the document for consistency with other chapters, and incorporate the financial chapter into the WSP.

Assumptions:

- *FCS Group has recently completed a rate study for the City that provides the foundation for the financial chapter analysis. This Scope of Work reflects efficiencies toward the financial chapter completion resulting from the prior rate study work.*

RH2 Deliverables:

- Financial Analysis for City review and comment.

Task 2.10 – Cross-connection Control Plan

Objective: Document the City's existing cross-connection control program.

Approach:

2.10.1 Review the City's existing cross-connection control ordinance and programs it has developed. Evaluate the documents for completeness, and incorporate elements necessary for consistency with regulations into the WSP.

2.10.2 Describe the consequences for failing to comply with the cross-connection control ordinance.

2.10.3 Document the responsibility of each City department for implementing the program and their relationship with one another and outside agencies.

2.10.4 Identify the primary and back-up staff positions delegated to the responsibility of organizing and implementing the cross-connection control program.

2.10.5 Identify the qualifications required for personnel working in the cross-connection control program.

2.10.6 Document the City's approval of qualifications for cross-connection control testers and specialists.

2.10.7 Document procedures for prioritizing and conducting surveys of existing facilities to identify existing and potential cross connections.

2.10.8 Document guidelines for assessing the degree of hazard and the selection of backflow assemblies.

2.10.9 Document standard requirements for installing and testing approved backflow assemblies.

2.10.10 Describe the recordkeeping system requirements for the cross-connection control program.

2.10.11 Describe the methods or processes that will provide information (public education, etc.) regarding the cross-connection control program to existing and projected future system customers.

2.10.12 Document procedures for responding to backflow incidents.

RH2 Deliverables:

- Completed Cross-connection Control Plan included in the WSP as an appendix.

Task 2.11 – Water Quality Monitoring Plan

Objective: Document the City's existing water quality monitoring requirements and procedures. Update the City's existing Coliform Monitoring Plan and *E. coli* Response Plan.

Approach:

2.11.1 Prepare a description of the water system as required by the Coliform Monitoring Plan.

2.11.2 Document source water quality monitoring requirements and procedures.

2.11.3 Document distribution system water quality monitoring requirements and procedures, including a schedule for coliform monitoring.

2.11.4 Prepare a color figure of the locations needed to meet the various monitoring requirements.

2.11.5 Prepare an *E. coli* Response Plan.

RH2 Deliverables:

- Descriptions and figures documenting the City's existing water quality, *E. coli* response, and coliform monitoring programs for City review and comment.

Task 2.12 – Water Use Efficiency Program

Objective: Update the City's Water Use Efficiency Program and water use efficiency goals for the water system. Prepare a Water Loss Control Action Plan.

Approach:

2.12.1 Evaluate the City's existing Water Use Efficiency (WUE) Program for completeness and incorporate elements necessary for consistency with regulations into the WSP.

2.12.2 Prepare a summary of water use efficiency planning efforts that have been completed since the WUE Program was adopted.

2.12.3 Assist the City in updating WUE goals through a public process. Document how each goal was established.

2.12.4 Identify and evaluate WUE measures for applicability and cost-effectiveness.

2.12.5 Prepare a schedule for implementation of the WUE measures and cost estimates for each measure.

2.12.6 Develop a Water Loss Control Action Plan (*assumes distribution system leakage is greater than ten (10) percent*). Include water loss control methods that will be implemented, an estimated schedule for achieving the distribution system leakage standard, a budget for the program, and an identification of technical or economic concerns that may prevent the City from meeting the distribution system leakage standard.

RH2 Deliverables:

- Descriptions documenting the City's WUE Program and Water Loss Control Action Plan for City review and comment.

Task 2.13 – Source Protection Program

Objective: Integrate the 2013 WSP Source Protection Program into the WSP and update the contaminant source inventory.

Approach:

2.13.1 Obtain the Source Protection Program from the 2013 WSP.

2.13.2 Update the inventory of potential contaminant sources and activities using available databases maintained by Ecology and the U.S. Environmental Protection Agency, and document the results of the inventory findings. *The inventory will include site locations and owners/operators.*

2.13.3 Identify owners and operators of known and potential sources of water contamination, businesses, regulatory agencies, and local governments, emergency response agencies, and City customers that must be notified of the City's watershed control and wellhead protection programs.

2.13.4 Document current implementation of the watershed control and wellhead protection programs and provide recommendations.

2.13.5 Review and update the watershed control area and map for the Canyon Springs source and provide a summary of potential risks from biosolids application near the watershed control area.

RH2 Deliverables:

- Incorporation of the 2013 Source Protection Program into the WSP update.
- Map of watershed control area for the Canyon Springs source.

Task 2.14 – Unidirectional Flushing Program

Objective: Update the City's existing unidirectional flushing program.

Approach:

2.14.1 Perform hydraulic analyses to determine the minimum pressures and maximum flushing velocity experienced with the City's existing flushing program.

2.14.2 Coordinate with the City to identify goals for the updated unidirectional flushing program, including maximum velocity, sensitive customers, and areas of concern.

2.14.3 Recommend improvements to the existing unidirectional flushing program to meet the established goals and reduce flushing velocities, flushing time, and dirty water complaints.

2.14.4 Develop digital PDF field map books showing flushing hydrants, closed valves, and flushing velocities for each hydrant flushing location.

2.14.5 Incorporate the digital PDF maps for the unidirectional flushing program into the City's water system GIS files and develop an annual or bi-annual schedule for completion of the program.

2.14.6 Prepare a summary of the unidirectional flushing program for inclusion in the O&M section of the WSP.

RH2 Deliverables:

- Unidirectional flushing program field map books in PDF format.
- Summary description of the unidirectional flushing program for inclusion in the O&M section of the WSP.

Task 2.15 – Source Alternatives Analysis

Objective: Perform a preliminary desktop analysis to evaluate alternatives to improve the utilization of the instantaneous rate and annual volume of the City's existing water rights, while improving the redundancy and reliability of the City's water supply sources. The results of the analysis will inform the CIP development of future detailed source studies and improvement projects. The analysis will be based on available water rights,

water quality, hydrology and hydrogeology, hydraulic capacity, and capital and operations and maintenance (O&M) costs.

Approach:

2.15.1 Review City, Ecology, and DOH documents associated with each water right and water source.

2.15.2 Compare water use by source to water rights to identify where water rights are being underutilized.

2.15.3 Review the hydrology and hydrogeology of the upper Snoqualmie watershed.

2.15.4 Review Washington Administrative Code (WAC) chapter 173-507 together with area hydrology, hydrogeology, and water rights to identify the possible geographic extent of where additional points of withdrawal/diversion could be located under the City's existing water rights.

2.15.5 Identify preferred source locations based on engineering considerations within the City's system given anticipated future demands, zones, and distribution system capacity.

2.15.6 Compare the water right and engineering considerations to identify up to three (3) alternative capacity enhancement options and develop planning level costs.

2.15.7 Present preliminary findings to City staff.

2.15.8 Prepare a technical memorandum summarizing the findings, recommendations, and next steps, which might include water right changes, well drilling, aquifer testing, pilot water treatability testing, and DOH project approval, and assign planning level costs to be included in the WSP CIP.

Assumptions:

- *Presentation to City staff will occur at the City.*

RH2 Deliverables:

- Presentation to City staff on preliminary findings.
- Technical memorandum of alternatives with suggested additional studies identified for inclusion in the CIP.

Task 2.16 – Executive Summary

Objective: Prepare an executive summary to describe the key elements of the WSP.

Approach:

2.16.1 Identify the purpose of the WSP and summarize the major system characteristics and significant changes that have occurred since the previous WSP was completed.

2.16.2 Briefly describe the key issues in the WSP, including the following.

- Policies and design criteria
- Population and demand forecasts
- Water Use Efficiency achievements and projections
- Emergency planning and O&M recommendations
- System evaluation and deficiencies
- Recommended improvements

- Financial status and recommendations

RH2 Deliverables:

- Draft executive summary chapter for City review and comment.

Task 2.17 – Appendices

Objective: Prepare miscellaneous appendices for inclusion in the WSP.

Approach:

2.17.1 Prepare the State Environmental Policy Act (SEPA) Checklist for use by the City. Obtain the Determination of Non-Significance (DNS) from the City to include in the appendix.

2.17.2 Obtain new service area agreements from the City to include in the appendices.

2.17.3 Obtain copies of new or revised City resolutions/ordinances and include in the appendices.

2.17.4 Include copies of Water Facilities Inventory (WFI) forms.

2.17.5 Include chronologically organized copies of the important documents forming the water right record for each water right utilized by the City. Prepare the water right self-assessment table.

2.17.6 Include a copy of the most recent Consumer Confidence Report.

2.17.7 Include a copy of City construction standards.

2.17.8 Include copies of consistency statement checklists and agency review comments.

RH2 Deliverables:

- Miscellaneous appendices for inclusion in the WSP.

Task 2.18 – Final Plan Binding, Printing, and Presentation

Objective: Prepare a final draft of the WSP and submit it to review agencies and adjacent water purveyors.

Approach:

2.18.1 Develop a cover format that includes the WSP name and revision date.

2.18.2 Meet with City staff to discuss the draft WSP. *It is assumed that two (2) RH2 staff will attend this meeting.*

2.18.3 Revise the WSP per City comments.

2.18.4 Prepare for and attend two (2) City Council meetings to present the draft WSP and the CFP. *These meetings will also be used to meet the public forum requirements of the City's WUE Program.* Present the water use efficiency goals for adoption by the City Council. *It is assumed that two (2) RH2 staff will attend each meeting.*

2.18.5 Bind up to ten (10) sets of the WSP in three-ring binders.

2.18.6 Create an electronic PDF version of the WSP.

2.18.7 Submit the WSP to adjacent water systems for their review and comment.

2.18.8 Submit the draft WSP to DOH and the County for review and comment.

RH2 Deliverables:

- Attendance at one (1) meeting with City staff. Meeting minutes will be provided via email to meeting participants.
- Presentation at two (2) City Council meetings.
- Up to ten (10) sets of the WSP with Professional Engineer stamps and signatures in three-ring binders for agency review.
- One (1) electronic PDF version of the WSP with Professional Engineer stamps and signatures for agency review.

Task 2.19 – Agency Review Revisions

Objective: Revise the WSP per DOH, County, and adjacent water system review comments.

Approach:

2.19.1 Modify the cover, title sheet, table of contents, chapters, and figures to reflect the final WSP.

2.19.2 Revise the WSP to address review comments provided by DOH, the County, and adjacent water systems.

2.19.3 Prepare response letters to each agency that provided review comments to summarize how each comment was addressed and the location of the associated responses in the update to the WSP.

2.19.4 Prepare PDFs for the final WSP document. Produce CDs of the digital WSP for transmittal to the City.

2.19.5 Produce copies of the revised WSP pages for inclusion with the draft WSP sent to review agencies. Prepare three (3) complete hard copies of the final WSP with Professional Engineer stamps and signatures for the City. Transmit the final WSP insertion pages with Professional Engineer stamps and signatures to the agencies.

Assumptions:

- *The number of review comments are difficult to predict and highly variable. An initial allocation of twenty-four (24) hours has been included in Task 2.19.2 for revisions to the WSP chapters based on agency and adjacent water system review comments. This allocation is based on typical levels of review comments received for WSP efforts. If an unusual number of comments are received, or the scope of the comments are excessive, RH2 will coordinate with the City to determine the next steps. This may include a scope amendment to address the comments.*

RH2 Deliverables:

- CD containing the digital version of the final WSP.
- Three (3) hard copies of the final WSP for the City's use.
- Insertion pages for the final WSP transmitted to each review agency.

Task 3 – GENERAL SEWER AND WASTEWATER FACILITIES PLAN

The following tasks are specific to the GSP update.

Task 3.1 – Introduction and Existing System Description

Objective: Provide a description of each component of the existing sewer system.

Approach:

3.1.1 Prepare a description of the sewer system ownership and management. Include the contact person and address.

3.1.2 Describe the purpose and goals of the GSP.

3.1.3 Prepare a summary of the operating descriptions of the City's existing collection systems, pump stations, and treatment facility.

3.1.4 Review the water reclamation facility's performance based on existing design and operating data. Summarize the current capacity and performance of treatment, effluent disposal, sludge handling, and disposal methods.

3.1.5 Prepare a process schematic showing the layout of the existing water reclamation facility and effluent disposal system.

3.1.6 Visit each facility with City staff to collect field information, observe equipment layouts and existing conditions, and obtain maintenance staff input/complaints regarding the existing sewer system.

3.1.7 Using existing maps provided by the City, develop color figures showing the City's service area, and collection, treatment, and disposal systems.

Assumptions:

- *The level of effort shown in the Fee Estimate for this Task assumes that the 2012 GSP contains the information required to complete this Task with only minimal effort by RH2 to update and reformat.*

RH2 Deliverables:

- Descriptions and figures of existing system components for City review and comment.

Task 3.2 – Wastewater Flow and Load Analyses

Objective: Develop the 20-year and buildout planning data for flow and loads for use in analyses of the collection system, lift stations, and water reclamation facility.

Approach:

3.2.1 Evaluate historical wastewater flow rate and load data and peaking factors based on information provided by the City.

3.2.2 Identify areas in the collection system for further study of flow and/or load. Provide recommendations to the City for deployment of equipment, type of information to collect, and frequency/duration of the data collection. *It is assumed the City will procure and install the required equipment and conduct or pay for the lab analyses. The City will provide the data to RH2 for further review. If necessary, based on this review, a second round of data collection may be needed and RH2 will provide recommendations.*

3.2.3 Based on information provided by the City on proposed developments and population growth and historical wastewater flow rate and load data, estimate wastewater flow and load changes for the 10- and 20-year, and buildout projections.

3.2.4 Meet with the City regarding calculated flow rates and water quality loading projections. *It is assumed that two (2) RH2 staff will attend this meeting.*

3.2.5 Prepare draft of the Wastewater Flow and Load Analyses chapter.

Assumptions:

- *The buildout scenario will be based on developable land use analysis provided by the City.*
- *The Snoqualmie Casino (Casino) will begin treating and discharging all the wastewater it generates and will stop discharging wastewater to the City's sewer system in 2021. Projected flow and loading from the Casino will be omitted for all projections from the year 2022 through buildout.*

RH2 Deliverables:

- Attendance at one (1) meeting with the City. Meeting minutes will be provided via PDF to meeting participants.
- Draft of the Wastewater Flow and Load Analyses chapter for City review and comment.

Task 3.3 – Regulations, Policies, and Design Criteria

Objective: Review existing policies and design criteria and recommend, as necessary, changes to these policies so that planned facilities can meet design standards. This will include a summary of the projected discharge criteria from Ecology.

Approach:

3.3.1 Review and document current National Pollutant Discharge Elimination System (NPDES) permit, federal, and state regulations. Document existing water quality requirements and known deficiencies. Discuss potential future water quality requirements and permit updates with Ecology, and document potential future criteria.

3.3.2 Review existing City standards pertaining to sewer system policies and criteria.

3.3.3 Identify existing policies and recommend additional or revised policies as necessary so that planned future City facilities can meet minimum and acceptable design standards and criteria. Use Ecology, U.S. Environmental Protection Agency, American Water Works Association, and standard engineering practices as the basis for identifying policies, criteria, and requirements.

3.3.4 Summarize each policy and design criteria.

3.3.5 Review the City's existing construction standards and include a copy in an appendix of the GSP.

3.3.6 Describe the process for responding to requests for new sewer service (individual and group services), including timeframes.

3.3.7 Describe the process for determining if the system's capacity is adequate to provide sewer service requests for new service.

3.3.8 Describe the procedures for granting or requesting extensions of time during a project. Describe the procedures for handling disputes and appeals when requests are denied.

3.3.9 Describe exception policies for extensions of sewer service outside of boundaries.

RH2 Deliverables:

- Descriptions of regulations, discharge requirements, policies, and design criteria for City review and comment.

Task 3.4 – Sewer Model Update and Calibration

Objective: Update the current sewer model of the City's existing sewer system. At the City's option, calibrate the sewer model by coordinating with the City to collect flow data at multiple key points in the sewer system.

Approach:

3.4.1 Convert the City's existing InfoSewer hydraulic model to SewerCAD and update the model with sewer mains smaller than ten (10) inches in diameter and recent sewer system improvements based on the City's comments and GIS data. Review the model with current sewer system mapping for consistency and completeness.

3.4.2 Prepare a preliminary hydraulic model figure. Coordinate with the City to review sewer system facilities shown in the model and update the model based on input from the City.

3.4.3 Update elevation data in the model by transferring data from electronic contours to model manhole nodes.

3.4.4 Input general estimated sewer flows based on known/measured flow rates at pump stations or in the system.

3.4.5 Perform preliminary hydraulic modeling analyses and compare model results to the City's field observations at pump stations or in the system to assess model accuracy.

3.4.6 Collect and compile available existing data for metered water usage, precipitation, average daily temperatures, and wastewater flows for 2012 through 2016 and evaluate infiltration and inflow (I/I). If possible, determine the quantity and sources of I/I and/or make recommendations for additional investigations.

3.4.7 Based on the assessed preliminary accuracy of the model and I/I analysis, recommend points in the sewer system for the City to collect flow discharge data to be used for model calibration.

3.4.8 Calibrate sewer models to new flow discharge data.

3.4.9 Coordinate with the City to identify the source of inconsistencies between the field calibration data and the modeled results. *Inconsistencies may be the result of unknown pipes in the system, incorrect invert elevations, or incorrect diameter of pipes shown on system mapping. Since this item is highly variable in nature, an initial allocation of eight (8) hours of a sewer modeling specialist's time have been included for this task.*

RH2 Deliverables:

- SewerCAD model for use in analyzing the existing and projected system.
- Coordination with City to confirm completeness and accuracy of the sewer model.

Task 3.5 – Sewer Collection System Analyses

Objective: Evaluate the existing collection system and pump stations for existing and projected growth conditions to identify deficiencies and recommend improvements. Assess the overall reliability and vulnerability of the existing system.

Approach:

3.5.1 Perform sewer modeling of the existing system to identify and describe existing deficiencies in the system.

3.5.2 Perform sewer modeling of projected conditions to identify and describe impacts to the existing system.

3.5.3 Develop and evaluate improvements to address existing deficiencies and plan for projected sewer system needs.

3.5.4 Document the sewer modeling criteria and model settings/assumptions.

3.5.5 Prepare color figures of the existing and projected sewer collection systems.

Assumptions:

- *Improvements will be planning level and conceptual in nature.*

RH2 Deliverables:

- Sewer modeling results.
- Recommended sewer improvements.
- Color figures of the existing and projected sewer systems.

Task 3.6 – Water Reclamation Facility Analysis and Plan

Objective: Prepare an analysis of the Water Reclamation Facility (WRF) and recommend capital projects for the repair/replacement of items identified as aging and in need of updates and an alternatives analyses and recommendation for major capital improvements for the expansion or upgrade of the existing water reclamation system processes to meet the flow and loading criteria, and the estimated discharge and design criteria.

Approach:

3.6.1 Review and summarize WRF capital projects completed since the 2012 GSP. Document updated design criteria for the WRF based on these improvements.

3.6.2 Develop a list of equipment in need of repair/replacement at the WRF based on discussions with the City. Prepare a description of each project, capital costs, priority, and need.

3.6.3 Develop a list of WRF capital projects needed based on input from the City, identified deficiencies based on hydraulic and loading capacities, upcoming more stringent regulatory requirements, or other operational improvements. For each of these projects, prepare the following:

- Prepare up to three (3) alternatives for comparison. Size and layout components for each alternative. Develop a schematic block diagram for each alternative, as needed.
- Prepare capital, operations and maintenance, and 20-year life-cycle costs for each alternative.
- Prepare the alternatives analyses and recommend the preferred alternative.

A second list of WRF capital projects needed for the WRF will be prepared with the assumption that the City of North Bend (North Bend) connects and discharges its wastewater to the City's WRF.

3.6.4 For the preferred alternative for each WRF capital project, prepare a detailed project implementation description, preliminary site layout, hydraulic profile and process diagram, preliminary design criteria, and O&M requirements.

Assumptions:

- *All deficiencies identified for the WRF from the year 2022 through buildout will be based on omitting projected flow and loadings from the Casino.*

RH2 Deliverables:

- Proposed WRF improvements for City review and comment.

Task 3.7 – Capital Facilities Plan

Objective: Describe, prioritize, and schedule improvements to address deficiencies identified in the sewer system analyses and WRF alternatives analyses. Prepare planning-level cost estimates for each project identified. Combine schedule and cost estimates into an overall CFP for the sewer utility

Approach:

3.7.1 Briefly describe sewer collection system and WRF improvements that have been completed since the last GSP update.

3.7.2 Prepare a list of proposed sewer pipeline replacements/rehabilitations for the existing collection system based on the results of the existing system and proposed system analyses. Briefly describe each group of related improvements and the purpose/benefit of the improvements.

3.7.3 Prepare a list of proposed sewer pump station improvements for the existing system based on the results of the existing system and proposed system analyses. Briefly describe each group of related improvements and the purpose/benefit of the improvements.

3.7.4 Prepare a list of proposed WRF improvements based on the results of the water reclamation facility alternatives analyses. Briefly describe each group of related improvements and the purpose/benefit of the improvements.

3.7.5 Review and make recommendations, as necessary, for changes to the City's existing standards for system replacements, rehabilitations, and extensions.

3.7.6 Prepare a planning-level cost estimate for each improvement identified in Tasks 3.7.2 and 3.7.3 based on current industry prices.

3.7.7 Coordinate with City staff to establish criteria for prioritizing and scheduling improvements. *Prioritization and scheduling will consider other scheduled projects based on information provided by the City and the CFPs developed for transportation and other utilities.*

3.7.8 Schedule improvements based on the results of the prioritization.

3.7.9 Prepare a table of improvements that includes an improvement identification number, a brief description of each improvement, the associated cost estimate, and the scheduling of the improvements on an annual basis for the first 10 years and the 20-year planning period.

3.7.10 Describe the criteria and procedures used for prioritizing and scheduling improvements.

3.7.11 Provide tables documenting the development of the capital facilities plan and integrate them within the chapter text.

3.7.12 Prepare color figures of Proposed Sewer System Improvements for the 10-year and 20-year planning periods.

3.7.13 Prepare GIS files of the existing system and proposed CIP for transmittal to the City. GIS layers will include a field to indicate flushing status and date for each pipe.

3.7.14 Prepare CFP fact sheets for up to twenty (20) individual sewer projects.

3.7.15 Meet with City staff to discuss the sewer system and WRF improvements and the proposed schedule of implementation. *It is assumed that two (2) RH2 staff will attend this meeting.*

RH2 Deliverables:

- Draft CFP tables and figures for City review and comment.
- Two (2) printed copies of up to twenty (20) CFP fact sheets.
- GIS files of the existing system and proposed CIP.
- Attendance at one (1) meeting with City staff. Meeting minutes will be provided via PDF to meeting participants.

Task 3.8 – Operations and Maintenance

Objective: Document the sewer system's operations and maintenance program for use in the GSP.

Approach:

3.8.1 Evaluate staffing requirements and document recommendations.

3.8.2 Obtain the Operations and Maintenance chapter from the City and incorporate staffing requirements. Review, format, and finalize the chapter for incorporation into the WSP.

RH2 Deliverables:

- Descriptions and tables documenting the City's existing operations and maintenance program for use in the GSP.
- Evaluation and recommendations of staffing requirements.

Task 3.9 – Financial Analysis

Objective: Coordinate with FCS Group, who will prepare a financial analysis of the existing and projected future water utility. The City will contract directly with FCS Group for these services.

Approach:

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3.9.1 Coordinate with FCS Group during the project and attend one (1) phone conference to provide information in support of the financial analysis chapter to be prepared by FCS Group.

3.9.2 Review the financial chapter produced by FCS Group, format the document for consistency with other chapters, and incorporate the financial chapter into the WSP.

Assumptions:

- *FCS Group has recently completed a rate study for the City that provides the foundation for the financial chapter analysis. This Scope of Work reflects efficiencies toward the financial chapter completion resulting from the prior rate study work.*

RH2 Deliverables:

- Financial Analysis for City review and comment.

Task 3.10 – Executive Summary

Objective: Prepare an executive summary to describe the key elements of the GSP.

Approach:

3.10.1 Identify the purpose of the GSP and summarize the major system characteristics and significant changes that have occurred since the previous GSP was completed.

3.10.2 Briefly describe the key issues in the GSP, including the following:

- Policies and design criteria
- Population and demand forecasts
- System and WWTF evaluation and deficiencies
- Recommended improvements
- Financial status and recommendations

RH2 Deliverables:

- Draft executive summary chapter for City review and comment.

Task 3.11 – Appendices

Objective: Prepare miscellaneous appendices for inclusion in the GSP.

Approach:

3.11.1 Prepare the SEPA Checklist for use by the City. Obtain the DNS from the City to include in the appendix.

3.11.2 Prepare the State Environmental Review Process (SERP) for compliance with Ecology requirements (including the Water Pollution Control Revolving Fund). Obtain the Affirmed determination from Ecology to include in the appendix.

3.11.3 Prepare the National Environmental Policy Act (NEPA) for federal compliance and funding opportunities. Obtain the DNS to include in the appendix.

3.11.4 Obtain the new service area agreement from the City to include in the appendices.

3.11.5 Obtain copies of new or revised City resolutions/ordinances and include in the appendices.

3.11.6 Include a copy of the NPDES Waste Discharge Permit.

3.11.7 Include a copy of City construction standards.

3.11.8 Include copies of agency review comments.

RH2 Deliverables:

- Miscellaneous appendices for inclusion in the GSP.
- One (1) electronic PDF and one (1) hard copy of the environmental documents.

Task 3.12 – Final Plan Binding, Printing, and Presentation

Objective: Prepare a final draft of the GSP and submit it to review agencies.

Approach:

3.12.1 Develop a cover format that includes the GSP name and revision date.

3.12.2 Meet with City staff to present the draft GSP. *It is assumed that two (2) RH2 staff will attend this meeting.*

3.12.3 Revise the GSP per City comments.

3.12.4 Prepare for and attend two (2) public meetings to present the draft CFP and GSP. *It is assumed that one (1) RH2 staff member will attend each meeting.*

3.12.5 Bind up to three (3) sets of the GSP with Professional Engineer stamps and signatures in three-ring binders.

3.12.6 Create an electronic PDF version of the GSP with Professional Engineer stamps and signatures.

3.12.7 Submit the draft GSP to Ecology for review and comment.

RH2 Deliverables:

- Attendance at one (1) meeting with the City. Meeting minutes will be provided via email to meeting participants.
- Presentation at two (2) public meetings.
- Up to three (3) sets of the GSP in three-ring binders for agency review.
- One (1) electronic PDF version of the GSP for agency review.

Task 3.13 – Agency Review Revisions

Objective: Revise the GSP per Ecology review comments.

Approach:

3.13.1 Modify the cover, title sheet, table of contents, chapters, and figures to reflect the final GSP.

3.13.2 Revise the GSP to address review comments provided by Ecology.

3.13.3 Prepare a response letter to Ecology to summarize how each comment was addressed and the location of the associated responses in the update to the GSP.

3.13.4 Prepare PDFs for the final GSP document with Professional Engineer stamps and signatures. Produce CDs of the digital GSP for transmittal to the City.

3.13.5 Produce copies of the revised GSP pages with Professional Engineer stamps and signatures for inclusion with the draft GSP sent to Ecology. Prepare three (3) complete hard copies of the final GSP for the City. Transmit the final GSP insertion pages to Ecology.

Assumptions:

- *The number of review comments are difficult to predict and highly variable. An initial allocation of twenty-four (24) hours has been included in Task 3.13.2 for revisions to the GSP chapters based on agency review comments. This allocation is based on typical levels of review comments received for GSP efforts. If an unusual number of comments are received, or the scope of the comments are excessive, RH2 will coordinate with the City to determine the next steps. This may include a scope amendment to address the comments.*

RH2 Deliverables:

- CD containing the digital version of the final GSP.
- Three (3) hard copies of the final GSP for the City's use.
- Insertion pages for the final GSP transmitted to each review agency.

Task 4 – STORMWATER SYSTEM PLAN (SWP)

The following tasks are specific to the SWP update. These tasks will be completed by RH2 and its subconsultant, Northwest Hydraulic Consultants (NHC).

Task 4.1 – Introduction and Existing System Description

Objective: Provide an introduction to the SWP and describe the City's existing system.

Approach:

4.1.1 Prepare a description of the stormwater system ownership and management. Include the contact person and address. *The SWP will focus on the City's regulated Municipal Separate Stormwater Sewer System (MS4), but will also reference private facilities that affect operation at the City's facilities (e.g., those at the TPC Snoqualmie Ridge Golf Course).*

4.1.2 Describe the purpose and goals of the SWP.

4.1.3 Review and summarize previous plans, existing system information, drainage complaints, and data.

4.1.4 Review and summarize regulated flood hazard areas within the City.

4.1.5 Over two (2) field days, visit as many stormwater facilities (e.g., detention ponds, water quality treatment facilities, etc.) as possible with City staff to collect field information, observe layouts and existing conditions, and obtain maintenance staff input/complaints regarding the existing stormwater system. *It is assumed that two (2) NHC staff will attend the first day, and one (1) NHC staff will attend the second day.*

4.1.6 Using existing maps provided by the City, develop color figures showing the City's stormwater collection system and facilities.

Provided by City:

- Maintenance staff will accompany and provide access to stormwater facilities.

RH2 Deliverables:

- Attendance at facility visits with City staff.
- Descriptions and figures of existing system components for City review and comment.

Task 4.2 – Study Area, Basins, and Characteristics

Objective: Delineate stormwater basins to define areas contributing runoff to the City's drainage system, conduct field reconnaissance, and update facility inventory information to support the modeling and capacity analysis.

Approach:

4.2.1 Identify major stormwater pipes and facilities within the City's stormwater system.

4.2.2 Delineate stormwater basins based on the City's system and existing GIS data.

4.2.3 Conduct a field reconnaissance to review basin boundaries and areas not clearly defined by the GIS data.

4.2.4 Update stormwater inventory based on findings and field survey. *It is assumed that the field survey of data gaps in the City's stormwater collection system will be limited to thirty-two (32) hours of staff field time (two (2) days each for two (2) staff members).*

4.2.5 Extend the field survey of data gaps by an additional sixteen (16) hours of staff field time (one (1) day each for two (2) staff members).

4.2.6 Prepare a description of the watershed, tributary drainage basins, climate, rainfall, topography, and soils.

4.2.7 Prepare color figures showing the watershed, tributary drainage basins, topography, and soils for the City.

Assumptions:

- *Major stormwater facilities include pipes twelve (12) inches in diameter and larger and major ditches.*
- *It is assumed that neither a WSDOT survey permit nor other traffic control plan review will be required for field survey work (i.e. it will be performed outside the WSDOT right-of-way).*

RH2 Deliverables:

- Stormwater basins delineated based on the City's system.
- Updated stormwater inventory in GIS format.
- Color figures showing the watershed, tributary drainage basins, topography, and soils for the City.

Task 4.3 – Regulations, Policies, and Design Criteria

Objective: Review existing stormwater and flood regulations, policies, and design criteria and recommend, as necessary, changes to these policies so that stormwater facilities can meet current design standards and new and existing regulatory requirements imposed by state and federal authorities.

Approach:

4.3.1 Provide high-level review and recommendations for changes to City flood hazard regulations and policies.

4.3.2 Summarize utility Level-of-Service goal (e.g., 25-year peak flow return period and depth threshold for acceptable flooding, if any).

Provided by City:

- Current City stormwater and flood regulations and coordination with City attorney.

RH2 Deliverables:

- Include a copy of the effective stormwater design, floodplain, and construction standards in an appendix of the SWP.
- Summary of high level recommendations for changes to the City's flood hazard regulations.

Task 4.4 – Stormwater Model Update and Calibration

Objective: Update the current stormwater models of the City's existing stormwater system. Calibrate the stormwater models by collecting fall/winter discharge data at up to four (4) locations within the City's stormwater system.

Approach:

4.4.1 Update the City's existing Hydrologic Simulation Program – Fortran (HSPF) and Stormwater Management Model (SWMM) stormwater models of downtown Snoqualmie (NHC, 2016) to include other existing and planned stormwater tributary areas as needed to facilitate identification of the CFP projects for the SWP.

4.4.2 Input land use classifications into the model and assign estimated pervious and impervious areas for use in future conditions stormwater modeling and review with the City.

4.4.3 Prepare a preliminary stormwater model diagram. Coordinate with the City to review stormwater system facilities shown in the diagram and extents of area to be modeled based on input from the City.

4.4.4 Provide recommendations to the City for flow monitoring hardware to be purchased by the City for this project.

4.4.5 Collect flow discharge data (fall or winter of 2017) at up to three (3) locations within the City's stormwater system for up to three (3) months (e.g. November 2017 – January 2018) by installing and removing two (2) of the three (3) instruments (assuming the third is permanent).

4.4.6 Calibrate stormwater models to new flow discharge data. Review the modeling for consistency with specific drainage complaints and maintenance staff observations applicable to existing stormwater system modeling.

4.4.7 Coordinate with the City to identify the source of inconsistencies between the field calibration data, drainage complaints, and modeled results. *Inconsistencies may be the result of unknown pipes in the system or incorrect diameter of pipes shown on system mapping. Since this item is highly variable in nature, an initial allocation of forty (40) hours of a stormwater modeling specialist's time have been included for this task.*

Assumptions:

- *Stormwater facilities to be modeled include major facilities (i.e., pipes twelve (12) inches in diameter and larger and major ditches) with potential problems needing CFP project evaluation and conceptual design.*
- *City will purchase flow monitoring instrumentation and installation hardware. This is expected to include two (2) temporary stations and one (1) permanent station. Data from the permanent station will be hosted on NHC's data portal if telemetry instrumentation is included. It is assumed that City staff will be available for confined space entry to install the purchased instrumentation.*

Provided by City:

- Assistance with identifying flow discharge data collection points in the system.
- Review and comment on future conditions for modeling.
- Review and comment on the stormwater model diagram.

- Assistance with identifying sources of inconsistencies in model calibration.

RH2 Deliverables:

- Coordination with the City to confirm completeness and accuracy of the stormwater model.
- Updated and calibrated stormwater model.

Task 4.5 – Stormwater System Modeling and Analyses

Objective: Evaluate existing stormwater collection system, including detention and treatment facilities, for existing and projected future growth conditions to identify deficiencies and recommend improvements. Assess the overall reliability and vulnerability of the existing system.

Approach:

4.5.1 Perform stormwater modeling of the existing system to identify and describe existing deficiencies in the system.

4.5.2 Perform stormwater modeling of projected future conditions to identify and describe impacts to the existing system.

4.5.3 Develop and evaluate improvements to address existing deficiencies and plan for future stormwater system needs.

4.5.4 Document the stormwater modeling criteria and model settings/assumptions.

4.5.5 Identify programmatic and structural opportunities to improve water quality (as required by TMDLs).

4.5.6 Prepare a color figure of the existing and planned future stormwater systems.

Assumptions:

- *Stormwater modeling will be performed for existing conditions and a single future condition, assumed to be buildout based on land use.*
- *Analyses of the conveyance system will be conducted for the 25-year event (or other event identified as the preferred level-of-service).*
- *Improvements will be planning level and conceptual in nature.*
- *Geomorphic and/or climate change analyses are excluded from this study.*

RH2 Deliverables:

- Stormwater modeling results.
- Recommended stormwater improvements.
- Color figures of the existing and future stormwater systems.

Task 4.6 – Capital Facilities Plan

Objective: Describe, prioritize, and schedule improvements to address deficiencies identified in the stormwater system analyses. Prepare planning-level cost estimates for each project identified. Combine schedule and cost estimates into an overall CFP for the stormwater utility.

Approach:

4.6.1 Prepare a list of proposed stormwater system improvements (both structural and non-structural) based on the results of the existing system and planned future system analyses. Briefly describe each group of related improvements and the purpose/benefit of the improvements.

4.6.2 Review and make recommendations, as necessary, for changes to the City's existing standards for system replacements, rehabilitations, and extensions.

4.6.3 Prepare a planning-level cost estimate for each improvement based on current industry prices.

4.6.4 Coordinate with City staff to establish criteria for prioritizing and scheduling improvements. *Prioritization and scheduling will consider other scheduled projects based on information provided by the City and the CFPs developed for transportation and other utilities.*

4.6.5 Schedule improvements based on the results of the prioritization.

4.6.6 Prepare a table of improvements that includes an improvement identification number, a brief description of each improvement, the associated cost estimate, and recommend scheduling for the improvements.

4.6.7 Describe the criteria and procedures used for prioritizing and scheduling improvements.

4.6.8 Provide tables documenting the development of the capital facilities plan and integrate them within the chapter text.

4.6.9 Prepare color figures of the Proposed Stormwater System Improvements for the buildout system.

4.6.10 Prepare GIS files of the existing system and proposed CIP for transmittal to the City. *GIS layers will include a field to indicate flushing status and date for each pipe.*

4.6.11 Prepare CFP fact sheets for up to ten (10) individual stormwater projects.

4.6.12 Meet with City staff to discuss the stormwater system improvements and the proposed schedule of implementation. *It is assumed that two (2) RH2/NHC staff will attend this meeting.*

RH2 Deliverables:

- Draft CFP tables, fact sheets, and figures for City review and comment.
- Two (2) printed copies of up to ten (10) CFP fact sheets.
- GIS files of the existing system and proposed CIP.
- Attendance at one (1) meeting with City staff. Meeting minutes will be provided via email to meeting participants.

Task 4.7 – Operations and Maintenance

Objective: Document the stormwater system's operations and maintenance program for use in the SWP.

Approach:

4.7.1 Evaluate staffing requirements and document recommendations.

4.7.2 Obtain the Operations and Maintenance chapter from the City and incorporate staffing requirements. Review, format, and finalize the chapter for incorporation into the WSP.

RH2 Deliverables:

- Descriptions and tables documenting the City's existing operations and maintenance program for use in the SWP.
- Evaluation and recommendations of staffing requirements.

Task 4.8 – Financial Analysis

Objective: Coordinate with FCS Group, who will prepare a financial analysis of the existing and projected future water utility. The City will contract directly with FCS Group for these services..

Approach:

4.8.1 Coordinate with FCS Group during the project and attend one (1) phone conference to provide information in support of the financial analysis chapter to be prepared by FCS Group.

4.8.2 Review the financial chapter produced by FCS Group, format the document for consistency with other chapters, and incorporate the financial chapter into the WSP.

Assumptions:

- *FCS Group has recently completed a rate study for the City that provides the foundation for the financial chapter analysis. This Scope of Work reflects efficiencies toward the financial chapter completion resulting from the prior rate study work.*

RH2 Deliverables:

- Financial Analysis for City review and comment.

Task 4.9 – Executive Summary

Objective: Prepare an executive summary to describe the key elements of the SWP.

Approach:

4.9.1 Identify the purpose of the SWP and summarize the major system characteristics.

4.9.2 Briefly describe the key issues in the SWP, including the following.

- Policies and design criteria
- Watershed and tributary drainage basis
- Existing and future systems
- System evaluation and deficiencies
- Recommended improvements
- Financial status and recommendations

RH2 Deliverables:

- Draft executive summary chapter for City review and comment

Task 4.10 – Appendices

Objective: Prepare miscellaneous appendices for inclusion in the SWP.

Approach:

4.10.1 Prepare the SEPA Checklist for use by the City. Obtain the DNS from the City to include in the appendix.

4.10.2 Prepare the SERP for compliance with Ecology requirements (including the Water Pollution Control Revolving Fund). Obtain the Affirmed determination from Ecology to include in the appendix.

4.10.3 Prepare the NEPA for federal compliance and funding opportunities. Obtain the DNS to include in the appendix.

4.10.4 Obtain copies of new or revised City resolutions/ordinances and include in the appendices.

4.10.5 Include copy of the Department of Ecology Phase II NPDES Permit.

4.10.6 Include a copy of City construction standards.

RH2 Deliverables:

- Miscellaneous appendices for inclusion in the SWP.

Task 4.11 – Final Plan Binding, Printing, and Presentation

Objective: Prepare a final draft of the SWP and submit it to review agencies.

Approach:

4.11.1 Develop a cover format that includes the SWP name and revision date.

4.11.2 Meet with City staff to discuss the draft SWP. *It is assumed that one (1) NHC staff will attend this meeting.*

4.11.3 Prepare for and attend one (1) public meeting to present the draft CFP and SWP. *It is assumed that one (1) NHC staff will attend this meeting.*

4.11.4 Bind up to three (3) sets of the SWP in three-ring binders.

4.11.5 Create an electronic PDF version of the SWP.

RH2 Deliverables:

- Attendance at one (1) meeting with City staff. Meeting minutes will be provided via email to meeting participants.
- Presentation at one (1) public meeting.
- Up to ten (10) sets of the SWP with Professional Engineer stamps and signatures in three-ring binders for agency review.
- One (1) electronic PDF version of the SWP with Professional Engineer stamps and signatures for agency review.

Task 4.12 – Agency Review Revisions

Objective: Revise the SWP per Ecology and County review comments.

Approach:

4.12.1 Modify the cover, title sheet, table of contents, chapters, and figures to reflect the final SWP.

4.12.2 Revise the SWP to address review comments provided by Ecology and the County.

4.12.3 Prepare response letters to Ecology and the County to summarize how each comment was addressed and the location of the associated responses in the update to the SWP.

4.12.4 Prepare PDFs for the final SWP document with Professional Engineer stamps and signatures. Produce CDs of the digital SWP for transmittal to the City.

4.12.5 Produce copies of the revised SWP pages with Professional Engineer stamps and signatures for inclusion with the draft SWP sent to Ecology and the County. Prepare three (3) complete hard copies of the final SWP for the City. Transmit the final SWP insertion pages to the agencies.

Assumptions:

- *The number of review comments are difficult to predict and highly variable. An initial allocation of twenty-four (24) hours has been included in Task 4.12.2 for revisions to the SWP chapters based on agency review comments. This allocation is based on typical levels of review comments received for SWP efforts. If an unusual number of comments are received, or the scope of the comments are excessive, RH2 will coordinate with the City to determine the next steps. This may include a scope amendment to address the comments.*

RH2 Deliverables:

- CD containing the digital version of the final SWP.
- Three (3) hard copies of the final SWP for the City's use.
- Insertion pages for the final SWP transmitted to each review agency.

Project Schedule

It is the goal of all parties that this Scope of Work shall be completed within eighteen (18) months of contract execution, assuming RH2 receives all data within ten (10) weeks of contract execution. The schedule for this project may be modified as mutually agreeable to RH2 and the City.

FUTURE TASKS

The Scope of Work for future phases may include generating utility maps that show data from the City's GIS and as-builts into cohesive maps with names and labels for system components, including O&M.

EXHIBIT B-1
City of Snoqualmie
Water System Plan Update
Data to be Provided by the City

The following list contains the information and data to be provided by the City of Snoqualmie (City) that is needed to update the City's Water System Plan (WSP). All available resources from previous planning work will be utilized to minimize the level of effort necessary. The list below is organized according to the Scope of Work tasks.

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
Task 2.1 – Introduction and Existing Water System Description			
1. Reservoir information that includes reservoir name, as-builts, location, year constructed, material, reservoir floor elevation, overflow elevation, diameter, ground elevation, operating levels (pump start level(s) for filling reservoir and pump stop level), fill pipe diameter, draw pipe diameter, and description of operation and control.	**H**		
2. Pressure reducing station data that includes station name, as-builts, location, main line and by-pass control valve size, normal inlet pressure, outlet pressure set points, operational priority, (lead, lag, second lag, etc.), ground elevation, and pressure relief valve size and set point, (if relief valve is included).	**H**		
3. List of check valves and zone valves (closed isolation valves between pressure zones) in the distribution system.	**H**		
4. Intertie information that includes adjacent system name, as-builts, location, water main size, control valve size and model number, and any other facility information.	**H**		
5. Telemetry and supervisory control information that includes manufacturer and year of telemetry system, type of communications link (radio or phone), facilities monitored at master telemetry unit, facilities with remote telemetry units.	**H**		
6. Water treatment information that includes location of treatment facilities, as-builts, type of treatment (disinfection, fluoridation, filtration, etc.), chemicals used and concentrations, method of metering, initial dosage amounts, and capacity of mixing or holding tanks.	**H**		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
7. Booster pump station data that includes pump station name, as-builts, location, year constructed, number of pumps, pump curves (or pump manufacturer and model number, pump serial number and impeller diameter), motor horsepower, ground elevation, normal pumping rate, and description of operation and control. Include reports from recent pump vibration and pump condition evaluations.	**H**		
8. Well data that includes well name, well log, location, year constructed, pump curve (or pump manufacturer and model number, pump serial number and impeller diameter); motor horsepower, well casing diameter, well column diameter, ground elevation, well depth, screen depth range, pump intake depth, normal pumping rate, static water level, water level at normal pumping rate, and description of operation and control.	**H**		
9. Spring information that includes name, as-builts, location, water main size, control valve size and model number, and any other facility information.	**H**		
10. Copy of water system seismic analysis report.	**H**		
11. Copy of most recent Department of Health (DOH) Sanitary Survey.	**H**		
12. Copy of GIS files of the base map, aerial photo, existing water system (including all water main, sources, pumping and storage facilities, gate and check valves, and hydrants), pressure zone boundaries, contours, existing retail and future service area boundaries, and existing future land use.	**H**		
13. Copy of any reports related to the pressure zone reconfiguration (i.e. engineering analyses, DOH project reports, etc.) Indicate which improvements are currently underway.	**H**		
14. Copy of the City's Comprehensive (Land Use) Plan.	**H**		
15. Summary of City's efforts and involvement in regional water system planning.	L		
16. Identify on a map the areas where growth is expected to occur.	M		
17. List of planned developments. Provide name of development, type of development, number of units and development schedule.	M		
Task 2.2 – Water Demands			
1. How often are customer meters read (monthly, every other month, etc.)?	**H**		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
2. Hourly and daily reservoir level records (telemetry data, circular charts, data sheets, etc.) from each storage facility for 2011 through 2016 (to be used to determine the system's peaking factors).	**H**		
3. Hourly and daily water production records from each source of supply for 2011 through 2017 (to be used to determine the system's peaking factors).	**H**		
4. Monthly water production totals from each source of supply from 2011 through 2017.	**H**		
5. Monthly (or bi-monthly) metered water consumption totals for each customer class from 2011 through 2017.	**H**		
6. Hourly or daily water consumption data for customer meters for 2016 and 2017, where available.	**H**		
7. Average number of connections for each month for each customer class from 2011 through 2017.	**H**		
8. Total number of multi-family units served in 2011 through 2017.	**H**		
9. List of customers (approximately 10 to 20) that used the most water in 2017 (as measured by individual meters), customer address and amount of consumption of each customer for the year.	**H**		
10. List of buildings with the largest fire flow requirements in the service area (provide at least three in each pressure zone). Provide name of building, address and fire flow requirement.	M		
11. General level of service fire flow requirements and duration for all land use classifications, such as single-family, multi-family, commercial, industrial, etc.	M		
12. Is water usage for construction projects, fire department activities and water main flushing recorded? If so, provide total annual amounts from 2011 through 2017.	**H**		
13. Database of annual totals of metered water consumption data for each meter, including address and parcel number, if available for 2015 and 2017.	**H**		
14. Copy of sample letter and certificate of water availability that is issued prior to receiving a building permit.	M		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
Task 2.3 – Policies and Design Criteria			
1. Copy of water system policies and design criteria chapter for inclusion in the WSP.	L		
2. Describe the process for responding to requests for new water service (individual and group services, including timeframes.	L		
3. Describe the process for determining if the system's capacity is adequate to provide water service to requests for new service. The process must include the determination of sufficient water rights.	L		
4. Describe any condition of a non-technical nature that may impact the ability to provide new water service (e.g., annexation procedures, water rights issues, local ordinances, etc.).	L		
5. Describe the procedures for granting or requesting extensions of time during a project. Describe the procedures for handling disputes and appeals when requests are denied.	L		
6. Describe policies for extensions of water service outside of boundaries. Describe how the policies are consistent with the local and county comprehensive (land use) plan, and development regulations	L		
Task 2.4 – Water Source and Quality			
1. Copy of water rights permits, certificates and other related information for all sources.	M		
2. Copy of water quality evaluation for inclusion in the WSP. Evaluation shall discuss existing drinking water quality regulations, water quality monitoring requirements and results of recent water quality testing and shall describe water supply characteristics and the effect of climate change on the City's sources.	M		
3. Copy of DOH Susceptibility Study.	M		
4. Copy of past lead and copper monitoring results (2011 through 2017)	M		
5. Copy of asbestos monitoring results (2011 through 2017).	M		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
6. Copy of source water quality monitoring results (2011 through 2017) for volatile organic chemicals, synthetic organic chemicals, inorganic chemicals and physical substances, and radionuclides.	M		
7. Summarize the results of past (2011 through 2017) coliform monitoring. Indicate if monitoring results indicated levels above the regulatory limits. For each situation where the regulatory requirements were not met, describe the source of the problem and the follow up procedures that corrected the problem.	M		
8. Summarize the results of past (2011 through 2017) disinfectant concentration monitoring. Indicate if monitoring results did not meet the regulatory requirements. For each situation where the regulatory requirements were not met, described the source of the problem and the follow up procedures that corrected the problem.	M		
9. Summarize the results of past (2011 through 2017) disinfectants and disinfection by-product monitoring and Initial Distribution System Evaluations.	M		
10. Summarize the method of disinfection and initial dosage at each source (2011 through 2017).	M		
11. Provide initial dosage of fluoride at each source.			
12. Copy of the most recent Consumer Confidence Report (CCR).	M		
13. List of dirty water complaints (2011 through 2017) including date and location of each complaint.	M		
14. Copy of Coliform Monitoring Plan.	M		
15. Copy of 2011 through 2017 Water Quality Monitoring Reports (WQMR) from DOH that lists the specific monitoring requirements for the City's system.	M		
Task 2.5 – Hydraulic Model Update and Calibration			
1. Copy of existing water model.	**H**		
2. Copy of GIS file showing location of existing gate valves, check valves, and hydrants in the system	**H**		
3. As-builts for recent water system improvements not contained in the existing hydraulic model.	**H**		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
Task 2.6 – Water System Analyses			
1. List of known low or high water pressures areas. Provide address and recorded pressure for each.	M		
2. List of known water system deficiencies and unsuitable pipe materials.	M		
3. List of past (2011 through 2017) water main breaks. Provide address and date that each occurred.	L		
4. List of facilities that have emergency power supply connections or stand-by emergency generator sets.	L		
5. Normal operating range of each reservoir (water elevation that well, intertie or control valve is called to fill reservoir or the normal drawdown in each reservoir).	**H**		
Task 2.7 – Operations and Maintenance			
1. Personnel organization chart.	L		
2. Brief description of the major responsibilities for any new staff positions shown on the organizational chart.	L		
3. Updated list of all operators and their certifications.	L		
4. Provide a list of all major equipment, supplies and chemicals used by the water system. Provide a list of the service representatives for major water system components and chemical suppliers.	L		
5. Provide a list of safety and first aid equipment owned by the system and identify safety training the personnel have and are required to have.	L		
6. Maintenance schedules for each facility.	L		
7. Staffing time for preventive maintenance of facilities and equipment.	L		
8. Staffing time for operation tasks.	L		
9. Identify procedures for keeping and compiling records and reports; provide a list of records that are on file; and identify where the records are filed.	L		
10. Procedures for testing the accuracy of water meters and identifying the frequency of tests. Indicate most recent calibration of source and customer meters.	L		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
11. Indicate approximate age of source and customer meters.	L		
12. List of the Utilities Division safety program activities and recent Labor and Industries' inspection reports.	L		
Task 2.8 – Capital Facilities Plan (CFP)			
1. List of desired water system improvements not contained in previous CFP.	M		
2. List of projects completed since the last WSP. List can be descriptive or map based.	M		
3. Copy of the City's most recent six-year Capital Facilities Plan. If not available, provide a list of all road and utility improvements currently planned by the City for the next six years to assist in coordinating the timing of water improvements with other capital improvements.	M		
Task 2.10 – Cross-connection Control Plan			
1. Copy of the existing cross-connection control ordinance/resolution and any programs it has developed.	L		
2. List of known backflow assemblies installed in the system	L		
3. Copy of latest cross-connection control program summary report that is submitted annually to DOH.	L		
Task 2.11 – Water Quality Monitoring Plan			
1. Copy of previous Water Quality Monitoring Plan.	L		
2. Copy of previous E. coli Response Plan	L		
3. Sampling rotation schedule for coliform monitoring, if not contained in coliform monitoring program.	L		
4. List of water source sampling sites. Indicate source of sample.	L		
5. Copy of monitoring waivers and related DOH correspondence	L		
Task 2.12 – Water Use Efficiency Program			
1. Copy of existing Water Use Efficiency program.	**H**		
2. Has leak detection been performed in the distribution system in the past? If so, indicate date, description of areas tested and findings. Provide a copy of the leak detection report.	M		
3. List of current water use efficiency goals.	**H**		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
4. Describe what, if any, previous water use efficiency efforts will be discontinued. Identify why continuation of these efforts would be ineffective or describe that the program had a prescribed end date or savings level.	M		
5. Describe any available or potential sources of reclaimed water. Identify opportunities for the use of reclaimed water (i.e. irrigation for parks or schools, construction purposes or street cleaning) and an estimated annual volume for each use.	M		
6. Amount budgeted for each individual water use efficiency measure that is part of the water use efficiency program.	M		
Task 2.13 – Source Protection Program			
1. Copy of previous Source protection Program from the previous WSP	L		
2. Summarize the City's past efforts toward protection of its water sources.	L		
3. List of known and potential water contaminant sources located within the watershed/wellhead protection areas.	L		
4. Identify present and past land uses (last 10 to 20 years) and proposed land uses that might pose a threat to the water sources.	L		
Task 2.14 – Unidirectional Flushing Program			
1. Copy of existing unidirectional flushing program.	M		
Task 2.15 – Pump Condition and Energy Efficiency Evaluation			
1. Electric rate schedules for each pumping facility.	**H**		
Task 2.16 – Executive Summary and Appendices			
1. Copy of current service area agreement. This was likely prepared during the development of the County's *Coordinated Water System Plan*.	L		
2. Copy of water resolutions or ordinances not specifically identified under other activities above.	L		
3. Copy of most recent Water Facilities Inventory (WFI) forms.	**H**		
4. Copy of standard maintenance logs and forms used.	L		
5. Copy of Cross-Connection Control Plan.	L		
6. Copy of Watershed Control Plan.	L		
7. Copy of Wellhead Protection Plan.	L		
8. Copy of Emergency Response Plan.	L		
9. Confirm date of last update of water system Vulnerability Assessment.	L		
10. Copy of intertie agreements.	M		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
11. Copy of the City's construction standards.	L		

Exhibit B-2
City of Snoqualmie
General Sewer and Wastewater Facilities Plan
Data to be Provided by the City

The following list contains the information and data to be provided by the City of Snoqualmie (City) that is needed to update the City's General Sewer and Wastewater Facilities Plan (GSP). The available resources from previous planning work will be utilized to minimize the level of effort necessary. All available resources from previous planning work will be utilized to minimize the level of effort necessary. It is anticipated that the GSP will be completed in conjunction with the City's Water System Plan (WSP) and Stormwater System Plan (SWP). The available resources collected during Task 1 will be utilized to prepare the GSP.

The list below is organized according to the Scope of Work activities. The engineering fee estimate for the project is based on this information being provided in whole prior to the commencement of the GSP Update for the high priority items. RH2 is entitled to rely upon the accuracy and completeness of any data information or materials provided by the City or others in relation to this work.

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
Task 3.1 – Introduction and Existing System Description			
1. Lift station data that includes lift station name, location, year constructed, number of pumps, pump curves (or pump manufacturer and model number, pump serial number, and impeller diameter), motor horsepower; wet well size, condition of materials, normal pumping rate (field measured); run time data; and description of operation and control.	**H**		
2. Telemetry and supervisory control information that includes the manufacturer and year of telemetry system; type of communications link (radio or phone); facilities monitored at master telemetry unit; and facilities with remote telemetry units.	**H**		
3. Copy of current National Pollutant Discharge Elimination System (NPDES) Permit.	**H**		
4. System collection information which includes force mains (locations, size, length, age, and material) and conveyance pipes/structures (manhole locations and sizes; pipe locations, invert elevations, sizes, age, and materials). Data can be AutoCAD or GIS.	**H**		
5. A copy of map or AutoCAD/GIS file showing City's existing and future sanitary sewer service area boundaries.	**H**		
6. A copy of map or AutoCAD/GIS file of drainage basins.	**H**		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
Task 3.2 – Wastewater Flow and Load Analyses			
1. Sludge disposal information for 2012 through 2017, including frequency of sludge disposal, method of disposal, and sludge quantities.	**H**		
2. Monthly wastewater monitoring records for the WRF influent and effluent (July 2017 through present). Include BOD, TSS, pH, chlorine residual and fecal coliform levels (if available).	**H**		
3. Flow meter records for flow entering and exiting the WRF (March 2015 through 2017).	**H**		
4. Wastewater flow records from available system meters (i.e., lift station and industrial users) for 2012 through 2017.	**H**		
5. Wastewater monitoring records for the Snoqualmie Casino (2012 through 2017), including flow, BOD, and TSS.	**H**		
6. Flow meter data for commercial or industrial users for the sewer collection system. Water data will suffice. Summer and winter data is needed (2012 through 2017).	**H**		
7. City sewer connection data, including residential, multi-family, commercial, and industrial users.	**H**		
8. Provide letters from the Department of Ecology or other agencies related to any wastewater system violations since the completion of the previous GSP.	**H**		
Task 3.3 – Regulations, Policies, and Design Criteria			
1. A copy of the City's sanitary sewer construction standards and details.	**H**		
2. A copy of sanitary sewer policies and design criteria.	**H**		
Task 3.4 – Sewer Model Update and Calibration			
1. Copy of City's existing sewer model.	**H**		
2. Copy of GIS files of the City's existing sewer system.	**H**		
3. As-builts for recent sewer system improvements not contained in the existing sewer model.	**H**		
4. Provide as-built information for each lift station. Include if the lift station has a generator or emergency power supply connection.	**H**		
5. Provide current set points for pump on and off levels for the lift stations and extreme operating conditions.	**H**		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
Task 3.5 – Sewer Collection System Analyses			
1. List of known sanitary sewer system deficiencies and unsuitable pipe materials that were not identified in the previous GSP.	**H**		
2. List of known lift station deficiencies and excessive maintenance requirements that were not identified in the previous GSP.	**H**		
Task 3.6 – Water Reclamation Facility Analysis and Plan			
1. List of completed WRF capital projects since the previous GSP.	**H**		
2. List of WRF equipment in need of repair/replacement.	M		
3. City of North Bend's most current GSP.	**H**		
Task 3.7 – Capital Facilities Plan			
1. List of sewer collection system projects completed since the previous GSP. List can be descriptive or map based.	**H**		
2. List of planned and desired sewer collection system improvements not contained in previous GSP.	M		
3. Provide bid tabulations from sewer system projects completed during the past five (5) years.	M		
Task 3.8 – Operations and Maintenance			
1. Provide personnel organization chart.	M		
2. Brief description of the major responsibilities for any staff positions shown on the organizational chart.	M		
3. List of operators and their certifications.	M		
4. Copy of standard maintenance logs and forms used by the sewer department.	M		
5. Maintenance schedules for each facility.	M		
6. Staffing time for preventative maintenance of facilities and equipment. Staffing time for collection system operational tasks (smoke testing, video inspection, cleaning, etc.).	M		
7. Provide a list of all major equipment, supplies, and chemicals used by the sewer system. Provide a list of the service representatives for major sewer system components and chemical suppliers.	M		
8. Provide a list of safety and first aid equipment owned by the system and identify safety training the personnel have and are required to have.	M		
Task 3.11 – Appendices			
1. Provide a State Environmental Policy Act (SEPA) Checklist.	L		

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
2. Copy of current service area agreement.	L		
3. Copy of any City resolution or ordinances.	L		

EXHIBIT B-3
City of Snoqualmie
Stormwater System Plan Update
Data to be Provided by the City

The following list contains the information and data to be provided by the City of Snoqualmie (City) that is needed to update the City's Stormwater System Plan (SWP). All available resources from previous planning work will be utilized to minimize the level of effort necessary.

Scope of Work/Information Needed	Priority	Notes	Status/ Delivered
1. GIS database including total existing impervious area, future impervious area, and stormwater inventory (pipe material type, pipe invert elevation, facilities, etc.)	**H**		
2. As-built drawings for any stormwater facilities not included in the GIS database (for example, we were provided as-built drawings for the Cedar Street improvements last year).	**H**		
3. Rainfall data for gages other than the SRBP2 pond gage operated by AESI on Snoqualmie Ridge (or a point of contact to obtain them).	**L**		
4. Listing of stormwater operations personnel, their positions/responsibilities, and certifications.	**L**		
5. List of major equipment and supplies used for stormwater system maintenance.	**L**		
6. Existing O&M manuals (other than NHC, 2013). For example, manuals used by staff in the field.	**L**		
7. Summary of current procedures for keeping and compiling records and reports regarding stormwater system maintenance.	**L**		
8. Maintenance schedules for each facility.	**L**		

EXHIBIT C

City of Snoqualmie
Water System Plan, General Sewer and Wastewater Facilities Plan,
and Stormwater System Plan Updates
Fee Estimate

	Description	Total Hours	Total Labor	Total Subconsultant	Total Expense	Total Cost
Task 1	**Coordinating All Utility Plans**	**343**	**$ 64,474**	**$ 11,358**	**$ 2,939**	**$ 78,771**
1.1	**Project/Team Management**	148	$ 30,152	$ 2,833	$ 757	$ 33,742
1.2	**Agency Coordination**	56	$ 10,836	$ 1,265	$ 472	$ 12,573
1.3	**Data Collection and System Inventories**	62	$ 10,621	$ 4,697	$ 737	$ 16,055
1.4	**Land Use and Population**	77	$ 12,865	$ 2,563	$ 973	$ 16,401
Task 2	**Water System Plan**	**1371**	**$ 225,915**	**$ -**	**$ 25,957**	**$ 251,872**
2.1	**Introduction and Existing System Description**	111	$ 17,883	$ -	$ 1,506	$ 19,389
2.2	**Water Demands**	80	$ 12,632	$ -	$ 380	$ 13,012
2.3	**Regulations, Policies, and Design Criteria**	14	$ 2,383	$ -	$ 64	$ 2,447
2.4	**Water Source and Quality**	54	$ 9,675	$ -	$ 246	$ 9,921
2.5	**Hydraulic Model Update and Calibration**	165	$ 26,143	$ -	$ 5,522	$ 31,665
2.6	**Water System Analyses**	214	$ 34,365	$ -	$ 4,540	$ 38,905
2.7	**Operations and Maintenance**	12	$ 2,078	$ -	$ 56	$ 2,134
2.8	**Capital Facilities Plan**	184	$ 29,487	$ -	$ 4,744	$ 34,231
2.9	**Financial Analysis**	9	$ 1,599	$ -	$ 99	$ 1,698
2.10	**Cross-connection Control Plan**	16	$ 2,548	$ -	$ 68	$ 2,616
2.11	**Water Quality Monitoring Plan**	29	$ 4,931	$ -	$ 373	$ 5,304
2.12	**Water Use Efficiency Program**	17	$ 2,710	$ -	$ 72	$ 2,782
2.13	**Source Protection Program**	18	$ 3,214	$ -	$ 85	$ 3,299
2.14	**Unidirectional Flushing Program**	141	$ 22,151	$ -	$ 4,351	$ 26,502
2.15	**Source Alternatives Analysis**	108	$ 20,018	$ -	$ 1,465	$ 21,483
2.16	**Executive Summary**	15	$ 2,455	$ -	$ 66	$ 2,521
2.17	**Appendices**	19	$ 3,195	$ -	$ 84	$ 3,279
2.18	**Final Plan Binding, Printing, and Presentation**	97	$ 17,064	$ -	$ 1,620	$ 18,684
2.19	**Agency Review Revisions**	68	$ 11,384	$ -	$ 616	$ 12,000
Task 3	**General Sewer and Wastewater Facilities Plan**	**1455**	**$ 251,541**	**$ 11,000**	**$ 16,462**	**$ 279,003**
3.1	**Introduction and Existing System Description**	72	$ 11,571	$ -	$ 801	$ 12,372
3.2	**Wastewater Flow and Load Analyses**	49	$ 8,236	$ -	$ 267	$ 8,503
3.3	**Regulations, Policies, and Design Criteria**	45	$ 7,430	$ -	$ 202	$ 7,632
3.4	**Sewer Model Update and Calibration**	113	$ 18,260	$ -	$ 2,468	$ 20,728
3.5	**Sewer Collection System Analyses**	46	$ 7,344	$ -	$ 1,158	$ 8,502
3.6	**Water Reclamation Facility Analysis and Plan**	732	$ 133,260	$ 11,000	$ 4,543	$ 148,803
3.7	**Capital Facilities Plan**	154	$ 24,515	$ -	$ 2,606	$ 27,121
3.8	**Operations and Maintenance**	12	$ 2,078	$ -	$ 56	$ 2,134
3.9	**Financial Analysis**	9	$ 1,599	$ -	$ 45	$ 1,644
3.10	**Executive Summary**	14	$ 2,235	$ -	$ 58	$ 2,293
3.11	**Appendices**	107	$ 17,743	$ -	$ 607	$ 18,350
3.12	**Final Plan Binding, Printing, and Presentation**	53	$ 8,850	$ -	$ 1,858	$ 10,708
3.13	**Agency Review Revisions**	49	$ 8,420	$ -	$ 1,792	$ 10,212
Task 4	**Stormwater System Plan**	**125**	**$ 21,145**	**$ 154,894**	**$ 3,124**	**$ 179,163**
4.1	**Introduction and Existing System Description**	-	$ -	$ 22,191	$ -	$ 22,191
4.2	**Study Area, Basins, and Characteristics**	-	$ -	$ 26,708	$ -	$ 26,708
4.3	**Regulations, Policies, and Design Criteria**	-	$ -	$ 7,088	$ -	$ 7,088
4.4	**Stormwater Model Update and Calibration**	-	$ -	$ 45,342	$ -	$ 45,342
4.5	**Stormwater System Modeling and Analyses**	-	$ -	$ 19,525	$ -	$ 19,525
4.6	**Capital Facilities Plan**	2	$ 306	$ 17,336	$ 63	$ 17,705
4.7	**Operations and Maintenance**	2	$ 350	$ 3,306	$ 9	$ 3,664
4.9	**Executive Summary**	-	$ -	$ 5,797	$ -	$ 5,797
4.10	**Appendices**	89	$ 14,944	$ -	$ 461	$ 15,405
4.11	**Final Plan Binding, Printing, and Presentation**	6	$ 1,015	$ 2,530	$ 1,053	$ 4,598
4.12	**Agency Review Revisions**	21	$ 3,579	$ 3,553	$ 1,514	$ 8,646
	PROJECT TOTAL	**3294**	**$ 563,075**	**$ 177,251**	**$ 48,483**	**$ 788,809**

EXHIBIT D
RH2 ENGINEERING, INC.
2018 SCHEDULE OF RATES AND CHARGES

RATE LIST	RATE	UNIT
Professional I	$153	$/hr
Professional II	$157	$/hr
Professional III	$162	$/hr
Professional IV	$175	$/hr
Professional V	$187	$/hr
Professional VI	$198	$/hr
Professional VII	$213	$/hr
Professional VIII	$229	$/hr
Professional IX	$257	$/hr
Administrative I	$134	$/hr
Administrative II	$148	$/hr
Administrative III	$151	$/hr
Administrative IV	$159	$/hr
Administrative V	$175	$/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	$0.545	price per mile (or Current IRS Rate)
Subconsultants	10%	Cost +
Outside Services	at cost	

Rates listed are adjusted annually.

EXHIBIT E

KEY PERSONNEL

Rick Ballard – Principal, QA/QC Reviewer

Michele Campbell – Overall Project Manager, Water System Plan Project Manager

Kenny Gomez – General Sewer and Wastewater Facilities Plan Project Manager

Northwest Hydraulic Consultants – Derek Stuart – Stormwater Plan Project Manager

FCS Group – Sergey Tarasov – Financial Analyses Project Manager

Dan Mahlum – Water Supply and Wastewater Treatment Engineer

Zach Schrempp – WSP Project Engineer

Eric Smith – Water Reclamation Facility Analysis Engineer

Barney Santiago – Water Quality Engineer

John Hendron – I/I Engineering Expert

Sean Kanda – GSP Project Engineer

Bret Beaupain – Stormwater Plan Review Engineer

Andy Dunn – Water Rights Expert

Steve Nelson – Hydrogeologist

Gregg Davidson – Staff Engineer

Alicia Pettibone – Permitting Expert

Emily Coba – Permitting Support

Tom Coleman – Wastewater Process Expert

Stephanie Perkins – Administrative Support

Note: This is key personnel and not every staff member who will work on the project.