



INFORMATIONAL MEMORANDUM

TO: Transportation and Infrastructure Committee
 FROM: Henry Hash, Public Works Director *H.H.*
 BY: Pat Brodin, Development Manager
 CC: Mayor Allan Ekberg
 DATE: October 18, 2019
 SUBJECT: Water and Sewer Comprehensive Plans
Project Nos. 91940101, 91940201
Consultant Contract with Carollo Engineers for 2020 Update

ISSUE

Approve a consultant contract with Carollo Engineers to update the Comprehensive Plans for the Water and Sewer Utilities.

BACKGROUND

Washington State Department of Health requires an update to the City's Water Supply Plan every six years to ensure that the water utility is active, and the operating permit remains in the green status, or compliant. Likewise, the Department of Ecology approves the Comprehensive Sewer Plan every six years. In the last update in 2015, the City contracted with Carollo Engineers for the Water and Sewer Comprehensive Plans. The new updates to the Water and Sewer Comprehensive Plans must be completed and approved by the end of 2020.

DISCUSSION

The current MRSC Consultant Roster was reviewed and three firms were short-listed to complete the updates to the Water and Sewer Comprehensive Plans. The firms were Carollo Engineers, HDR Engineers, and Pace Engineers. The Summary of Qualifications tables were evaluated from each firm and Carollo was the unanimous choice based on their regional experience and sound knowledge regarding Tukwila's water and sewer infrastructure. Key water topics included in the update will be demographic and demand projections, incorporating remaining useful life, updating and calibrating the water model, provide updated fire flow results, and water quality regulatory requirements. Water storage is an issue that will need to be addressed. Key sewer topics include sewer flow projections, flow monitoring at critical sewer locations, create a sewer model of the commercial business district to aid with capital projects and evaluate the commercial district conveyance system, sewer lift station improvements, update the repair and replacement program, summarize reclaimed water use, and update any regulatory requirements.

FINANCIAL IMPACT

The consultant contract with Carollo Engineers will split between the Water and Sewer Utilities: The Sewer Contract in this update will be higher than expected because of the Department of Ecology reset and new model.

<u>Utility</u>	<u>Carollo Contract</u>	<u>Budget</u>
Water Comp Plan	\$ 182,441.00	\$ 280,000.00
Sewer Comp Plan	<u>277,951.00</u>	<u>280,000.00</u>
Total	<u>\$ 460,392.00</u>	<u>\$ 560,000.00</u>

RECOMMENDATION

Council is being asked to approve the consultant contract with Carollo Engineers for the update to the Comprehensive Water and Sewer Plans for \$460,392.00 and consider this item on the Consent Agenda at the November 4, 2019 Regular Meeting.

Attachments: Pages 64 & 80, 2019 CIP
Scoring Sheet
Consultant Agreement w/Scopes

CITY OF TUKWILA CAPITAL PROJECT SUMMARY

2019 to 2024

PROJECT: Water Comprehensive Plan

Project No. 91040101

DESCRIPTION: Prepare the new Water Comprehensive Plan incorporating any regulatory or new Growth Management Act Comprehensive Plan issues related to running the water utility.

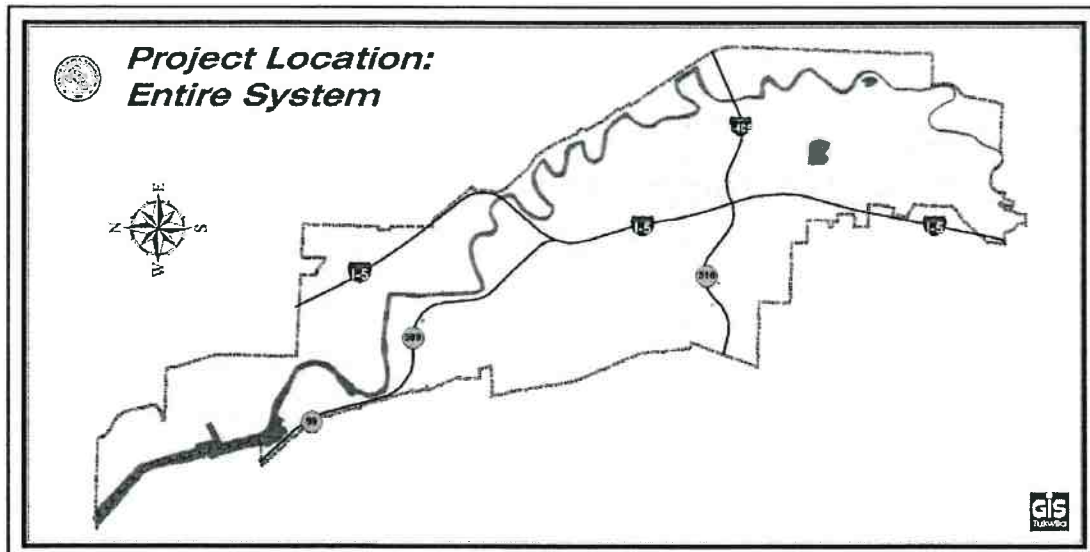
JUSTIFICATION: Plan needs to be consistent with City's Comprehensive Plan and the Department of Health requires the plan to be updated every 6 years.

STATUS: Current Water update was adopted in 2015. The next update is scheduled for 2021.

MAINT. IMPACT:

COMMENT:

FINANCIAL (in \$000's)	Through		Estimated								TOTAL
	2017	2018	2019	2020	2021	2022	2023	2024	BEYOND		
EXPENSES											
Design	234		140	140						514	
Land (R/W)										0	
Const. Mgmt.										0	
Construction										0	
TOTAL EXPENSES	234	0	140	140	0	0	0	0	0	514	
FUND SOURCES											
Awarded Grant										0	
Proposed Grant										0	
Mitigation Actual										0	
Mitigation Expected										0	
Utility Revenue	234	0	140	140	0	0	0	0	0	514	
TOTAL SOURCES	234	0	140	140	0	0	0	0	0	514	



CITY OF TUKWILA CAPITAL PROJECT SUMMARY

2019 to 2024

PROJECT: Sewer Comprehensive Plan

Project No. 91040202

DESCRIPTION: Prepare new Sewer Comprehensive Plan incorporating any new or regulatory Growth Management Act Comprehensive Plan issues related to sewer.

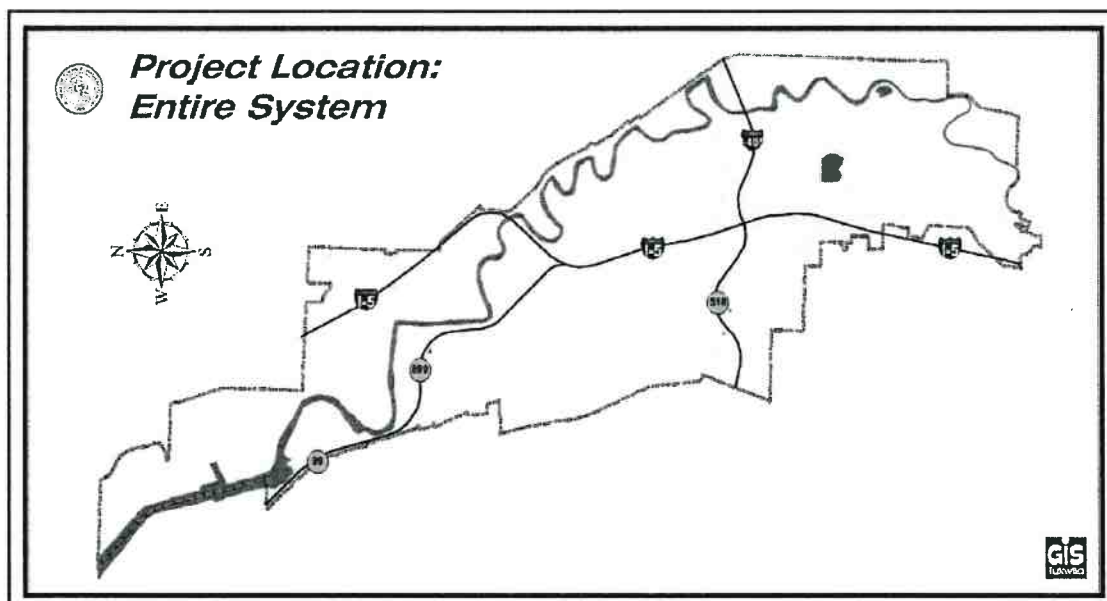
JUSTIFICATION: Sewer Comprehensive Plan needs to be consistent with City Comprehensive Plan, Department of Ecology and Department of Health. Update is required every 6 years.

STATUS: 2013 Sewer update was adopted by Council on 6/2/14. Next update is scheduled for 2021.

MAINT. IMPACT:

COMMENT:

FINANCIAL (in \$000's)	Through		Estimated							TOTAL
	2017	2018	2019	2020	2021	2022	2023	2024	BEYOND	
EXPENSES										
Design	158		140	140						438
Land (R/W)										0
Const. Mgmt.										0
Construction										0
TOTAL EXPENSES	158	0	140	140	0	0	0	0	0	438
FUND SOURCES										
Awarded Grant										0
Proposed Grant										0
Mitigation Actual										0
Mitigation Expected										0
Utility Revenue	158	0	140	140	0	0	0	0	0	438
TOTAL SOURCES	158	0	140	140	0	0	0	0	0	438



Consultant Selection

WATER/SEWER Comprehensive Plans: 2020 Updates	Approach to System & Supply Plan Updates		Understanding of Comprehensive Utility Capital/Financial/Ops		Qualifications/Expertise of Project Manager		Qualifications/Expertise of Team		Experience with Feds/State DOH or DOE/Local Agencies		Interview	Total	Rank
	10	30	20	20	20	20	20	20	20	20			
Submitter											100	200	
CAROLLO	31.5	107	77	77	77	77	77	77	79	79	362	734	1
Average Score	7.9	26.8	19.3	19.3	19.3	19.3	19.3	19.3	19.8	19.8	90.5	183.4	
	8	27	20	20	20	20	20	20	20	20	89	184	3
	8.5	26	19	19	19	19	19	19	19	19	91	183	3
	7	25	18	18	18	18	18	18	20	20	87	176	2
	8	29	20	20	20	20	20	20	20	20	95	191	1
PACE	28	79	58	58	58	58	58	58	52	52	289	570	2
Average Score	7.0	19.8	14.5	14.5	14.5	14.5	14.5	14.5	13.0	13.0	72.3	142.5	
	6	20	15	15	15	15	15	15	14	14	65	136	1
	7	19	17	17	17	17	17	17	15	15	81	156	1
	8	21	12	12	12	12	12	12	12	12	75	143	1
	7	19	14	14	14	14	14	14	11	11	68	135	2
HDR	26	75	46	46	46	46	46	46	47	47	262	503	3
Average Score	6.5	18.8	11.5	11.5	11.5	11.5	11.5	11.5	11.8	11.8	65.5	125.8	
	6	19	12	12	12	12	12	12	14	14	58	121	2
	7	18	10	10	10	10	10	10	12	12	70	130	3
	6	18	10	10	10	10	10	10	10	10	64	118	3
	7	20	14	14	14	14	14	14	11	11	70	134	3



PROFESSIONAL SERVICES AGREEMENT

(Includes consultants, architects, engineers, accountants, and other professional services)

THIS AGREEMENT is entered into between the City of Tukwila, Washington, hereinafter referred to as “the City”, and Carollo Engineers, hereinafter referred to as “the Consultant”, in consideration of the mutual benefits, terms, and conditions hereinafter specified.

1. **Project Designation.** The Consultant is retained by the City to perform Engineering Plan services in connection with the project titled Water and Sewer Comprehensive Plan Update.
2. **Scope of Services.** The Consultant agrees to perform the services, identified on Exhibit “A” attached hereto, including the provision of all labor, materials, equipment and supplies.
3. **Duration of Agreement; Time for Performance.** This Agreement shall be in full force and effect for a period commencing upon execution and ending December 31, 2020, unless sooner terminated under the provisions hereinafter specified. Work under this Agreement shall commence upon written notice by the City to the Consultant to proceed. The Consultant shall perform all services and provide all work product required pursuant to this Agreement no later than December 31, 2020 unless an extension of such time is granted in writing by the City.
4. **Payment.** The Consultant shall be paid by the City for completed work and for services rendered under this Agreement as follows:
 - A. Payment for the work provided by the Consultant shall be made as provided on Exhibit “B” attached hereto, provided that the total amount of payment to the Consultant shall not exceed \$560,000.00 without express written modification of the Agreement signed by the City.
 - B. The Consultant may submit vouchers to the City once per month during the progress of the work for partial payment for that portion of the project completed to date. Such vouchers will be checked by the City and, upon approval thereof, payment shall be made to the Consultant in the amount approved.
 - C. Final payment of any balance due the Consultant of the total contract price earned will be made promptly upon its ascertainment and verification by the City after the completion of the work under this Agreement and its acceptance by the City.
 - D. Payment as provided in this section shall be full compensation for work performed, services rendered, and for all materials, supplies, equipment and incidentals necessary to complete the work.
 - E. The Consultant’s records and accounts pertaining to this Agreement are to be kept available for inspection by representatives of the City and the state of Washington for a period of three (3) years after final payments. Copies shall be made available upon request.

5. **Ownership and Use of Documents.** All documents, drawings, specifications and other materials produced by the Consultant in connection with the services rendered under this Agreement shall be the property of the City whether the project for which they are made is executed or not. The Consultant shall be permitted to retain copies, including reproducible copies, of drawings and specifications for information, reference and use in connection with the Consultant's endeavors. The Consultant shall not be responsible for any use of the said documents, drawings, specifications or other materials by the City on any project other than the project specified in this Agreement.
6. **Compliance with Laws.** The Consultant shall, in performing the services contemplated by this Agreement, faithfully observe and comply with all federal, state, and local laws, ordinances and regulations, applicable to the services rendered under this Agreement.
7. **Indemnification.** The Consultant shall defend, indemnify and hold the City, its officers, officials, employees and volunteers harmless from any and all claims, injuries, damages, losses or suits including attorney fees, arising out of or resulting from the acts, errors or omissions of the Consultant in performance of this Agreement, except for injuries and damages caused by the sole negligence of the City.

Should a court of competent jurisdiction determine that this Agreement is subject to RCW 4.24.115, then, in the event of liability for damages arising out of bodily injury to persons or damages to property caused by or resulting from the concurrent negligence of the Consultant and the City, its officers, officials, employees, and volunteers, the Consultant's liability hereunder shall be only to the extent of the Consultant's negligence. It is further specifically and expressly understood that the indemnification provided herein constitutes the Consultant's waiver of immunity under Industrial Insurance, Title 51 RCW, solely for the purposes of this indemnification. This waiver has been mutually negotiated by the parties. The provisions of this section shall survive the expiration or termination of this Agreement.

8. **Insurance.** The Consultant shall procure and maintain for the duration of the Agreement, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Consultant, its agents, representatives, or employees. Consultant's maintenance of insurance as required by the agreement shall not be construed to limit the liability of the Consultant to the coverage provided by such insurance, or otherwise limit the City's recourse to any remedy available at law or in equity.

A. **Minimum Amounts and Scope of Insurance.** Consultant shall obtain insurance of the types and with the limits described below:

1. **Automobile Liability** insurance with a minimum combined single limit for bodily injury and property damage of \$1,000,000 per accident. Automobile Liability insurance shall cover all owned, non-owned, hired and leased vehicles. Coverage shall be written on Insurance Services Office (ISO) form CA 00 01 or a substitute form providing equivalent liability coverage. If necessary, the policy shall be endorsed to provide contractual liability coverage.
2. **Commercial General Liability** insurance with limits no less than \$1,000,000 each occurrence, \$2,000,000 general aggregate. Commercial General Liability insurance shall be at least as broad as ISO occurrence form CG 00 01 and shall cover liability arising from premises, operations, stop-gap independent contractors and personal injury and advertising injury. The City shall be named as an additional insured under the Consultant's Commercial General Liability insurance policy with respect to the work performed for the City using an additional insured endorsement at least as broad as ISO CG 20 26.
3. **Workers' Compensation** coverage as required by the Industrial Insurance laws of the State of Washington.

4. **Professional Liability** with limits no less than \$1,000,000 per claim and \$1,000,000 policy aggregate limit. Professional Liability insurance shall be appropriate to the Consultant's profession.
 - B. **Other Insurance Provision.** The Consultant's Automobile Liability and Commercial General Liability insurance policies are to contain, or be endorsed to contain that they shall be primary insurance with respect to the City. Any Insurance, self-insurance, or insurance pool coverage maintained by the City shall be excess of the Consultant's insurance and shall not be contributed or combined with it.
 - C. **Acceptability of Insurers.** Insurance is to be placed with insurers with a current A.M. Best rating of not less than A:VII.
 - D. **Verification of Coverage.** Consultant shall furnish the City with original certificates and a copy of the amendatory endorsements, including but not necessarily limited to the additional insured endorsement, evidencing the insurance requirements of the Contractor before commencement of the work. Upon request by the City, the Consultant shall furnish certified copies of all required insurance policies, including endorsements, required in this Agreement and evidence of all subcontractors' coverage.
 - E. **Notice of Cancellation.** The Consultant shall provide the City with written notice of any policy cancellation, within two business days of their receipt of such notice.
 - F. **Failure to Maintain Insurance.** Failure on the part of the Consultant to maintain the insurance as required shall constitute a material breach of contract, upon which the City may, after giving five business days notice to the Consultant to correct the breach, immediately terminate the contract or, at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the City on demand, or at the sole discretion of the City, offset against funds due the Consultant from the City.
9. **Independent Contractor.** The Consultant and the City agree that the Consultant is an independent contractor with respect to the services provided pursuant to this Agreement. Nothing in this Agreement shall be considered to create the relationship of employer and employee between the parties hereto. Neither the Consultant nor any employee of the Consultant shall be entitled to any benefits accorded City employees by virtue of the services provided under this Agreement. The City shall not be responsible for withholding or otherwise deducting federal income tax or social security or for contributing to the state industrial insurance program, otherwise assuming the duties of an employer with respect to the Consultant, or any employee of the Consultant.
 10. **Covenant Against Contingent Fees.** The Consultant warrants that he has not employed or retained any company or person, other than a bonafide employee working solely for the Consultant, to solicit or secure this contract, and that he has not paid or agreed to pay any company or person, other than a bonafide employee working solely for the Consultant, any fee, commission, percentage, brokerage fee, gifts, or any other consideration contingent upon or resulting from the award or making of this contract. For breach or violation of this warrant, the City shall have the right to annul this contract without liability, or in its discretion to deduct from the contract price or consideration, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift, or contingent fee.
 11. **Discrimination Prohibited.** Contractor, with regard to the work performed by it under this Agreement, will not discriminate on the grounds of race, religion, creed, color, national origin, age, veteran status, sex, sexual orientation, gender identity, marital status, political affiliation, the presence of any disability, or any other protected class status under state or federal law, in the selection and retention of employees or procurement of materials or supplies.
 12. **Assignment.** The Consultant shall not sublet or assign any of the services covered by this Agreement without the express written consent of the City.

13. **Non-Waiver.** Waiver by the City of any provision of this Agreement or any time limitation provided for in this Agreement shall not constitute a waiver of any other provision.
14. **Termination.**
- A. The City reserves the right to terminate this Agreement at any time by giving ten (10) days written notice to the Consultant.
 - B. In the event of the death of a member, partner or officer of the Consultant, or any of its supervisory personnel assigned to the project, the surviving members of the Consultant hereby agree to complete the work under the terms of this Agreement, if requested to do so by the City. This section shall not be a bar to renegotiations of this Agreement between surviving members of the Consultant and the City, if the City so chooses.
15. **Applicable Law; Venue; Attorney's Fees.** This Agreement shall be subject to, and the Consultant shall at all times comply with, all applicable federal, state and local laws, regulations, and rules, including the provisions of the City of Tukwila Municipal Code and ordinances of the City of Tukwila. In the event any suit, arbitration, or other proceeding is instituted to enforce any term of this Agreement, the parties specifically understand and agree that venue shall be properly laid in King County, Washington. The prevailing party in any such action shall be entitled to its attorney's fees and costs of suit. Venue for any action arising from or related to this Agreement shall be exclusively in King County Superior Court.
16. **Severability and Survival.** If any term, condition or provision of this Agreement is declared void or unenforceable or limited in its application or effect, such event shall not affect any other provisions hereof and all other provisions shall remain fully enforceable. The provisions of this Agreement, which by their sense and context are reasonably intended to survive the completion, expiration or cancellation of this Agreement, shall survive termination of this Agreement.
17. **Notices.** Notices to the City of Tukwila shall be sent to the following address:
- City Clerk
 - City of Tukwila
 - 6200 Southcenter Boulevard
 - Tukwila, WA 98188
- Notices to Consultant shall be sent to the following address:
- Carollo Engineers
 - 1218 3rd Ave., Suite 1600
 - Seattle, WA 98101
18. **Entire Agreement; Modification.** This Agreement, together with attachments or addenda, represents the entire and integrated Agreement between the City and the Consultant and supersedes all prior negotiations, representations, or agreements written or oral. No amendment or modification of this Agreement shall be of any force or effect unless it is in writing and signed by the parties.

DATED this _____ day of _____, 2019 .

CITY OF TUKWILA

CONSULTANT

Allan Ekberg, Mayor

By: _____

Printed Name: _____

Title: _____

Attest/Authenticated:

Approved as to Form:

City Clerk, Christy O'Flaherty

Office of the City Attorney

EXHIBIT A

CITY OF TUKWILA

DRAFT SCOPE OF SERVICES

COMPREHENSIVE WATER SYSTEM PLAN

The following Scope of Services has been developed to assist the City of Tukwila (City) with the 2020 update of its Water System Plan (Plan). The objective of this project is to update and review all elements of the Plan documents, in accordance with WAC 246-290-100 and State of Washington Department of Health (DOH) regulations. The following tasks under this Scope of Services has been prepared based on Carollo's (Consultant) and its subconsultant's current understanding of the proposed project, and on discussions with City staff.

PROJECT BACKGROUND

The City initiated this Plan update recognizing the importance of planning, developing, and financing water system facilities as a means to provide reliable and efficient service for existing customers and to serve anticipated growth. The Plan is designed to meet state, county, and local requirements. The City's last Water System Plan was completed in 2015. This Plan will be consistent with the City's current update of the City's Comprehensive Plan, creating a cohesive and complementary set of documents.

PROJECT ASSUMPTIONS

1. Carollo Engineers, Inc. and its subconsultants will be referred to as "Consultant" in this document.
2. The City of Tukwila and its staff will be referred to as "City" in this document.
3. All meetings will be held at City offices.
4. Draft Chapters will be provided in electronic copy (PDF and/or Microsoft Word) transmitted via email or secure file transfer.
5. City comments on draft chapters will be documented in the Project Comment Response Log by the Consultant. The Consultant will prepare responses to address the comments in the Comment Response Log for the City's review and acceptance. Resulting changes will be incorporated in the Draft Agency Review Plan, rather than reissuing a draft chapter at the time. However, revised draft chapters can be produced upon City required.
6. Electronic Demand Tool will be provided in .xlsx format.
7. The Consultant will prepare an agenda, presentation materials, and document discussions, including action items and decisions, in meeting minutes for Consultant-led meetings.
8. Meeting notes and related materials will be transmitted electronically in MS Word and PDF formats via email.
9. The City will print and produce additional copies of all documents as necessary for its use.
10. The City will provide available information related to the project and as requested by the Consultant in a timely manner. The City shall furnish Consultant available studies, reports, and other data pertinent to Consultant's services; obtain, or authorize Consultant to obtain, or provide additional reports and data as required; furnish to Consultant services of others required for the performance of Consultant's services hereunder, and Consultant shall be entitled to use and rely upon all such information and services provided by the City or others in performing Consultant's services under this Agreement.

SUMMARY OF CHAPTERS AND APPENDICES

Chapter / Appendix	Chapter Lead
Executive Summary	Consultant
Chapter 1: Introduction	Consultant
Chapter 2: Existing System	Consultant
Chapter 3: Policies & Criteria	Consultant
Chapter 4: Water Requirements	Consultant
Chapter 5: System Analysis	Consultant
Chapter 6: Water Use Efficiency	Consultant
Chapter 7: Water Quality	Consultant
Chapter 8: Operations and Maintenance	Consultant
Chapter 9: Capital Improvement Plan	Consultant
Chapter 10: Financial Plan	City
Appendix A: Notice of Determination of Non-Significance (DNS)	City
Appendix B: State Environmental Policy Act (SEPA) Checklist	City
Appendix C: Local Government Consistency Determination Form	City
Appendix D: Agency Comment Letters and Responses	City
Appendix E: Ordinances and Approvals	City
Appendix F: Water System Plan Submittal Form	Consultant
Appendix G: DOH Water System Plan Checklist	Consultant
Appendix H: Interlocal Agreements	City
Appendix I: Water Facilities Inventory Form	City
Appendix J: Water Rights Self-Assessment Forms	Consultant
Appendix K: Demographic and Demand Forecast Tables	Consultant
Appendix L: TM 1: Hydraulic Model Update and Calibration	Consultant
Appendix M: Water Quality Sampling Procedures and Program	City
Appendix N: Revised Coliform Monitoring Plan	City
Appendix O: Emergency Response Plan	City
Appendix P: Water Shortage Response Plan and Service Reliability	City
Appendix Q: Cross-Connection Control Program	City
Appendix R: Standard Construction Specifications for Distribution Mains	City
Appendix S: CIP Cost Estimates	Consultant

TASKS

To meet the objectives of this Scope of Services, the Consultant shall complete the tasks as summarized in the table below and discussed in detail in the text that follows.

TASK SUMMARY	
Task Number	Task Name
Task 100	Project Management
Task 200	Introduction
Task 300	Existing System
Task 400	Demographic Analysis and Demand Projections
Task 500	System Analysis
Task 600	Water Use Efficiency
Task 700	Water Quality
Task 800	Operations and Maintenance
Task 900	Capital Improvement Plan
Task 1000	Financial Analysis
Task 1100	Plan Integration

TASK 100 – PROJECT MANAGEMENT

The purpose of this task is to direct all activities within the Plan as assigned by the City and maintain the project within the contracted scope, schedule, and budget. This includes project administration, monthly invoicing, client and team coordination and quality assurance/quality control review necessary to successfully complete the assigned chapter of the Plan to the City's expectations. Additionally, the Consultant will develop a Project Management Plan (PMP) and lead the initial team kick-off meeting. This task includes the following activities:

TASK 100 ACTIVITIES

101. Monthly Progress Reports and Invoices. This subtask includes production and implementation of the project plan, schedule, and budget. Assist the project team members in the implementation of the task items, reviewing the work-in-progress reports. Prepare and submit monthly activity reports showing current project status and identifying key issues or elements of the project that will need to be addressed in the proceeding weeks. An electronic version of the monthly progress reports will be sent to the City for review and approval. This task assumes that no hard copy of the monthly progress reports will be distributed.

102. Project Management Plan. Prepare a Project Management Plan (PMP) that describes deliverables, Plan outline, anticipated meetings, project roles and responsibilities, lists contact information for the project team, describes communications protocols, quality management, and includes the scope of services, schedule, and budget. Quality Management includes, but is not limited to, the following elements:

- Project Manager overview of all primary documents to verify technical consistency and compliance with contract requirements.
- Organization of the work into logical deliverables with qualified staff for each task assigned to the work.
- Resolution of all review comments with a memorandum summarizing key comments and the manner in which each was addressed in the work.

An electronic version of the Project Management Plan will be sent to the City for review and approval. This task assumes that no hard copy of the Project Management Plan will be distributed.

103. Meeting No. 1 – Kick-off Meeting. Facilitate a kick-off meeting to review project management and initial data requests.

104. Client Coordination.

- Manage the consultant project team to track time and budget, work elements accomplished, work items planned for the next period, manpower, scope changes, time and budget needed to complete the project.
- Create and maintain a working project schedule based on the schedule in the PMP.
- Review project status, including scope, budget, and schedule.

Task 100 Assumptions

- The PMP will be updated with full incorporation of review comments after the City review of the draft PMP.
- The total length of the project is 18 months.
- City provides required documents for appendices.

Task 100 City Deliverables

1. Team member contact information.
2. PMP review for completeness.
3. Receive, review, and process Consultant invoices in a timely manner.
4. Respond to data requests in a timely manner.

Task 100 Consultant Deliverables

1. Draft request list.
2. Draft Plan outline.
3. Draft PMP.
4. Final PMP.
5. Eighteen monthly progress reports and invoices.

Task 100 Meetings

- Meeting No. 1 – Kick off Meeting.

TASK 200 – INTRODUCTION

The objective of this task is to create the City's introduction to the Plan. This task will develop Chapter 1 – Introduction of the Plan and will develop Chapter 3 – Policies and Criteria. The chapters will be developed based on the information contained in 2015 Plan Chapter 1. A new Chapter 3 – Policies and Criteria is created to facilitate review and implementation of newly proposed policies and criteria. The task includes the following activities:

TASK 200 ACTIVITIES

201. Meeting No. 2 – 2015 Chapter 1 Review. Facilitate a meeting to review and identify updates needed to 2015 Plan Chapter 1 – Introduction. This may include: related comprehensive water plans from the neighboring jurisdictions and other related plans; recent history of the City's water system; and policies and criteria. A data request will be prepared based on the meeting.

202. Data Acquisition. Prepare a data request for the required information. The request may include, but is not limited to, the following:

- Related comprehensive water plans from the neighboring jurisdictions and other related plans.
- Agreements with neighboring jurisdictions.
- Neighboring/adjacent jurisdictions map, in Geographic Information System (GIS) format with current boundaries.

- GIS data for the sewer system including City Limits, current water service area, urban growth area (UGA), and interties.
- Policies and criteria related to service area and conditions of service, in MS Word. It is assumed the City will provide language for all requested changes to policies and criteria.
- Emergency Management goals, including redundancy and reliability standards related to system components, in MS Word.
- Duty to Serve.
- City and County land use plans and zoning.
- Satellite management program.
- Annexation policy.
- SEPA and Notice of Determination of Non-Significance (DNS).
- Local Government Consistency Determination Form.

203. Revise Chapter 1. Prepare a revised Chapter 1 – Introduction based on current information. It is anticipated that any revisions will be minor. An electronic version of the draft Chapter will be sent to the City for review. City comments will be recorded in the Record of Comment and will be incorporated into the Chapter as part of the City Review Draft Plan.

204. Create New Chapter 3. Prepare a revised Chapter 3 – Policies and Criteria based on City input on Policies and Criteria. As part of the preparation, the Consultant will review policies and criteria and confirm they fulfill DOH Water System Plan requirements. It is anticipated that any revisions will be minor. An electronic version of the draft Chapter will be sent to the City for review. City comments will be recorded in the Record of Comment and will be incorporated into the Chapter as part of the City Review Draft Plan.

Task 200 Assumptions

- City can provide elements listed under Task 202.
- It is anticipated that the City will lead the environmental and agency Plan review and approval process. The City will provide all associated documentation to the Consultant.
- This task will involve updating the chapter from the 2015 Plan.
- No hard copy of the chapter will be distributed.

Task 200 City Deliverables

1. Requested Data from Task 202.
2. Agency Comment Letters and Responses.
3. Adopting ordinances and approvals.
4. Water System Plan Submittal Form.
5. Comments on draft Chapter 1 – Introduction.
6. Comments on draft Chapter 3 – Policies and Criteria.

Task 200 Consultant Deliverables:

1. Meeting No. 2 – 2015 Chapter 1 Review Meeting Agenda, Materials, and Minutes.
2. Draft Chapter 1 – Introduction.
3. ROC for Chapter 1 – Introduction.
4. Draft Chapter 3 – Policies and Criteria.
5. ROC for Chapter 3 – Introduction.
6. DOH Water System Plan Checklist.

Task 200 Meetings

- Meeting No. 2 – 2015 Chapter 1 Review.

TASK 300 – EXISTING SYSTEM

The objective of this task is to document the City's existing water system (e.g., supply, storage, booster pump stations, interties, and distribution). The task will develop 2020 Chapter 2 –Existing Water System, which will be based on revisions to the 2015 Chapter 4 – Existing System. The change in chapter numbering is intended to better align with DOH's Water System Outline and assist in regulatory review. This task includes the following activities:

TASK 300 ACTIVITIES

301. Meeting No. 3 - Existing System Review. Facilitate a meeting to review and identify updates needed to 2015 Chapter 4 – Existing System. A data request will be prepared based on the meeting.

302. Data Acquisition. Prepare a data request for the required information. The request may include, but is not limited to, the following:

- GIS data for existing facilities, service areas, and inventory.
- Data on pipeline materials and age by linear foot, as available.
- Existing renew and replacement program.
- Summary of improvements completed since the 2015 Plan.
- Data on existing infrastructure (e.g. supply, storage, booster pump stations, interties, and distribution).
- Water Facilities Inventory Form.
- Interlocal Agreements.

303. Revise 2020 Chapter 2 – Existing System. Prepare a revised Chapter 2 – Existing System with updated information. It is anticipated that any revisions will be minor. An electronic version of the draft Chapter will be sent to the City for review. City comments will be recorded in the Record of Comment and will be incorporated into the Chapter as part of the City Review Draft Plan.

Task 300 Assumptions

- City can provide elements listed under Task 302.
- This task will involve updating the chapter from the 2015 Plan.
- No hard copy of the chapter will be distributed.

Task 300 City Deliverables

1. Requested Data from Task 302.
2. Interlocal Agreements.
3. Water Facilities Inventory Form.
4. Comments on Draft Chapter 2 – Existing System.

Task 300 Consultant Deliverables

1. Draft Chapter 2 – Existing System.
2. ROC for Chapter 2 – Existing System.
3. Meeting No. 3 – Existing System Review Meeting Agenda, Materials, and Minutes.

Task 300 Meetings

- Meeting No. 3 – Existing System Chapter Review.

TASK 400 – DEMOGRAPHIC ANALYSIS AND DEMAND PROJECTIONS

The purpose of this task is to perform a demographic analysis and demand projections for the City's Service Area; 10-year and 20-year planning horizons will be evaluated using the best available information. This task will develop the 2020 Chapter 4 – Demographic Analysis and Demand Projections, which will include completely revised projections consistent with the Puget Sound Regional Council (PSRC) 2040 Vision and the most recent

water use information. Note, it has been moved from the 2015 Chapter 2 to 2020 Chapter 4 to better align with DOH's Water System Plan outline and facilitate regulatory review. This task includes the following activities:

TASK 400 ACTIVITIES

401. Data Request. Develop and submit a request for data required for Chapter 4. The following data are anticipated to be required:

- a. Demographic growth rates consistent with Regional Planning under PSRC 2040 Vision. Population, household, and employment projections (if available) by Transportation Analysis Zones (TAZ) are preferred.
- b. Historical connection and water use information by customer class from 2010 through the present. Monthly or Bimonthly water use is preferred.
- c. Historical supply purchases from 2010 through the present, including maximum day supply (if available). Monthly or Bimonthly purchases is preferred.
- d. Historical supply purchases for the maximum week in 2015, 2018, or 2019 to generate a diurnal water use curve for the system.
- e. Historical water use from up to ten (10) large customers. If large users have more than one meter, then water use by meter is preferred.
- f. Accounted-for Non-Revenue water from 2010 through the present.
- g. GIS data: land use and zoning data, vacant and re-developable land, TAZ boundaries.

402. Demographics Analysis. Analyze demographic growth in customers. Use data from PSRC and the City to calculate rates of growth for each TAZ and each pressure zone. High, low, and average number of accounts will be prepared for the 10-year and 20-year planning horizons by pressure zone, if sufficient data is available.

403. Demand Projections. Demand projections will be for the 10-year and 20-year.

- a. Develop the historical average day demands (ADD) and maximum day demands (MDD), the accounted-for revenue water uses, estimated water loss and leakage planning values, and establish equivalent residential unit (ERU) values for the different customer classes.
- b. Project the future ADD and MDD water demand for each pressure zone based on the demographic analysis and historical ERU demand. Estimates of low, moderate, and high scenario future water demand will be determined. The scenarios will be based on the variations in key demand parameters, such as ERU value or the MDD/ADD peaking factor. Up to ten (10) of the City's largest connections may be projected separately and added to other projected system demands. Peak hour demand (PHD) will be calculated using a diurnal water use curve from a maximum water use week in recent years.

404. Meeting No. 4 – Demographic Analysis and Demand Projections. Present the methods and results of the demographic analysis and demand projections for the City's review and approval. The WUE program will also be discussed. Prepare an agenda, presentation materials, and document discussions, including action items and decisions, in meeting minutes.

405. Demand model. Provide excel database with projected ERUs and resulting demand for City's use in future updates.

406. Create Draft Chapter 4 – Demographic Analysis and Demand Projections. Prepare draft Chapter 4 for City's review and approval. City comments and Consultant responses will be tracked in the Comment Response Log. Comments on this chapter will be incorporated into the final Plan.

Task 400 Assumptions

- The Service Area and pressure zones will be delineated prior to development of the water requirements.
- This task will require a complete update of the Chapter with all new information.

Task 400 City Deliverables

1. Requested Data.
2. Comments on Chapter 4 – Demographic Analysis and Demand Projections.

Task 400 Consultant Deliverables

1. Meeting No. 4 – Demographic Analysis and Demand Projections Meeting Agenda, Materials, and Minutes.
2. Draft Chapter 4 – Demographic Analysis and Demand Projections.
3. ROC for Chapter 4 – Demographic Analysis and Demand Projections.
4. Demographic and Demand Forecast Tables.

Task 400 Meetings

- Meeting No. 4 – Demographic Analysis and Demand Projections.

TASK 500 – SYSTEM ANALYSIS

The purpose of this task is to evaluate the future water system to identify potential deficiencies and proposed improvements, including supply, storage, booster pump stations, and distribution. The hydraulic model piping will be updated and calibrated based on results of hydrant tests performed by the City. Improvements identified in other tasks will be incorporated into the model, as appropriate, to determine the effect of comprehensive improvements. This task will develop 2020 Chapter 5 – System Analysis. It includes information contained in 2015 Chapters 3 – Supply Analysis, 2015 Chapter 5 – Hydraulic Model Update, and Chapter 6 – Distribution System Analysis. This task includes the following activities:

TASK 500 ACTIVITIES

501. Data Request. Develop and submit a request for data required by Chapter 5. The following data are anticipated to be required:

- a. Cascade Water future supply planning.
- b. King County Reclaimed Water planning.
- c. Existing well pump tests, capacity evaluations and/or aquifer characterizations.
- d. Potential location for future storage facilities.

502. Update Hydraulic Profile. Prepare an updated hydraulic profile figure.

503. Water Right Self-Assessment. Complete DOH Water Right Self-Assessment (Tables 1 through 3).

504. Desktop Analysis – Water Supply Analysis. Summarize the City and Cascade Water’s long-term supply planning. Summarize City’s existing water right (Foster Links Golf Course). Additionally, summarize potential use of reclaimed water.

505. Desktop Analysis – Storage Analysis. Identify the storage volume required for each pressure zone based on the established storage criteria for equalizing, fire flow, operational, and standby volumes. The storage analysis will be performed for the 10-year and 20-year projected demands.

506. Desktop Analysis – Pump Station Analysis. Identify the pumping capacity requirements per the evaluation criteria. Compare requirements to current pump station capacity to identify any deficiencies for the 10-year and 20-year projected demand scenarios. Required upgrades, modifications, or operational changes will be recommended, as necessary.

507. Desktop Analysis – Limiting Factor Analysis. Conduct the limiting factor analysis using DOH WSDM 6-1. Calculate the water system service connections correlated to ERUs and the physical system capacity as ERUs. The Limiting Factor Analysis will use information summarized in previous chapters, where applicable. The Limiting Factor Analysis will be conducted for the sought approval period.

508. Meeting No. 5 – Desktop Analysis Workshop. Facilitate a meeting to present the water right, supply, storage, and pump station analysis results for the City’s review and approval. As part of this meeting, the City will select preferred options for future storage options.

509. Update Hydraulic Model/Calibration. Review and update system piping, as required. Calibrate the steady state InfoWater hydraulic model to check model results against field conditions through up to three hydrant flow test comparisons. Hydrant flow tests will be conducted by the City. Allocate 10-year, 20-year demands, and updated diurnal curve to the model. It is assumed the City will confirm all fire flow requirements (FFR) in the model and provide revisions, as needed.

510. Future Storage Siting. Based on the required storage, up to four locations for a future reservoirs will be evaluated based on the locations defined in 2014 Water Reservoir Siting Study that may include, but are not limited to:

- a. Cerini Hill.
- b. Existing Tank Location
- c. Lease from Adjacent Utility.
- d. Private Parcel on North Hill.

Develop required pipe sizing for each location using the hydraulic model determine if pipe upsizing improvements to the existing system would be required for each location. It is assumed the locations will use the same pipe routing proposed in the 2014 study; no new reservoir locations will be considered. It is assumed the City will conduct all discussions with adjacent utilities. The options will exclude service to the 340, 380, and 465 Pressure Zones. Develop preliminary costs consistent with Task 900 for the options to aid with City decision making. Future Storage Siting will be presented as part of Meeting No. 5 – Desktop Analysis Workshop

511. Fire and System Pressure Analysis. Using the updated hydraulic model, perform analysis of the system evaluating fire flow and system pressures per DOH regulations and guidelines based on the City’s water system criteria. The steady state analysis will focus on distribution capacity deficiencies for pressure, velocity, and available fire flow. Prepare figures showing deficiencies.

512. Identification of Water Improvement Projects. Identify improvements to address deficiencies under the MDD plus fire flow simulations and the peak hour simulations for the 10-year and 20-year scenarios. Previously identified supply, storage, and booster pump station improvements will be incorporated to assist in meeting deficiencies. The water system projects will be incorporated into the existing CIP from the 2015 Plan and any changes to projects will be summarized, if required.

513. Meeting No. 6 – System Improvements Workshop. Present identified deficiencies and improvements for City review and comment.

514. Create Draft Chapter for Chapter 5 – System Analysis. Prepare draft Chapter 5 for City’s review and approval. City comments and Consultant responses will be tracked in the Comment Response Log. Comments on this chapter will be incorporated into the final Plan.

Task 500 Assumptions

- The City will provide assumptions on future sources and quantities of supply.
- The City will provide assumptions on future storage locations and conduct all discussions with SPU or adjacent utilities.
- The City will conduct hydrant flow testing to support model calibrations.

- This task will require a complete update of the Chapter with all new information.

Task 500 City Deliverables

1. Requested Data.
2. Comments on draft Chapter 5 – System Analysis

Task 500 Consultant Deliverables

1. Meeting No. 5 – Desktop Analysis Workshop Agenda, Materials, and Minutes.
2. Meeting No. 6 – System Improvements Workshop Agenda, Materials, and Minutes.
3. Draft Chapter 5 – System Analysis.
4. ROC for Chapter 5 – System Analysis.
5. Hydraulic Model Update and Calibration Technical Memorandum.

Task 500 Meetings

- Meeting No. 5 – Desktop Analysis Workshop.
- Meeting No. 6 – System Improvements Workshop.

TASK 600 – WATER USE EFFICIENCY

The purpose of this task is to summarize the City’s Water Use Efficiency Program as a member of Cascade Water Alliance and will develop 2020 Chapter 6 – Water Use Efficiency. An independent WUE Chapter is being created to assist the City in meeting future regulatory requirements. The task will include the following activities:

TASK 600 ACTIVITIES

602. Data Acquisition. Prepare a data request for the required information. WUE will be discussed as part of Meeting No. 4 – Demographic Analysis and Demand Projections. The request may include, but is not limited to, the following:

- Cascade Water Use Efficiency Program.
- WUE goals and public adoption documentation.
- WUE measures that have been implemented.
- Yearly consumer education.
- Reported Water Loss.

603. Revise Chapter 6. Prepare a revised Chapter 6 – Water Use Efficiency based on updated information. It is anticipated that program revisions will be minor and the water demand with conservation will be reflected in the “low” demand scenario developed. An electronic version of the draft Chapter will be sent to the City for review. City comments will be recorded in the Record of Comment and will be incorporated into the Chapter as part of the City Review Draft Plan.

Task 600 Assumptions

- City can provide elements listed under Task 602.
- This task will involve updating the content from the 2015 Plan.
- No hard copy of the chapter will be distributed.

Task 600 City Deliverables

1. Requested Data from Task 602.
2. Water Loss Control Action Plan.
3. Comments on Draft Chapter 6 – Water Use Efficiency.

Task 600 Consultant Deliverables

1. Draft Chapter 6 – Water Use Efficiency.

2. ROC for Chapter 6 – Water Use Efficiency.

Task 600 Meetings

- None

TASK 700 – WATER QUALITY

The purpose of this task is to summarize water quality regulations and reporting requirements, evaluation of water quality against the regulations, summary of any water quality violations, and recommended improvements, if necessary, to meet anticipated or future water quality regulations. This task will develop 2020 Chapter 7 – Water Quality of the Plan. An independent Water Quality Chapter is being created to assist the City in meeting future regulatory requirements. The task will include the following activities:

TASK 700 ACTIVITIES

702. Data Acquisition. Prepare a data requests will be provided required information. The request may include, but is not limited to, the following:

- Water Quality Sampling Procedures & Program.
- Consumer Confidence Reports.
- Water quality violations, if applicable.
- Revised Coliform Monitoring Plan.
- Boil Water Notices.

703. Revise Chapter 7. Prepare a revised 2020 Chapter 7 – Water Quality based on updated information. Revisions will be discussed as part of Meeting No. 8 – Operation and Maintenance Chapter Review. It is anticipated that any revisions will be minor. An electronic version of the draft Chapter will be sent to the City for review. City comments will be recorded in the Record of Comment and will be incorporated into the Chapter as part of the City Review Draft Plan.

Task 700 Assumptions

- City can provide elements listed under Task 702.
- This task will involve updating the chapter from the 2015 Plan.
- No hard copy of the chapter will be distributed.
- This task does not include review or update of the City’s Water Quality Monitoring Plan, Coliform Monitoring Plan, and other water quality programs and plans.

Task 700 City Deliverables

1. Requested Data from Task 702.
2. Water Quality Sampling Procedures & Program.
3. Revised Coliform Monitoring Plan.
4. Comments on Draft Chapter 7 – Water Quality.

Task 700 Consultant Deliverables

1. Draft Chapter 7 – Water Quality.
2. ROC for Chapter 7 – Water Quality.

Task 700 Meetings:

- None

TASK 800 – OPERATION AND MAINTENANCE

The purpose of this task is to review, update, and evaluate the City's Operations and Maintenance (O&M) Program document 2020 Chapter 8 – Operations and Maintenance. The chapters will be developed based on the information contained in 2015 Plan Chapter 7, which has been renumbered from the 2015 Plan due to changes in earlier chapters. An evaluation of the O&M programs will provide recommendations for new or updated maintenance programs, as needed. This task will include the following activities:

TASK 800 ACTIVITIES

801. Meeting No. 7 - Existing Chapter Review. Facilitate a meeting to review and identify updates needed to 2020 Chapter 8 – Operations & Maintenance. A data request will be prepared based on the meeting.

802. Data Acquisition. Prepare a data requests will be provided required information. The request may include, but is not limited to, the following:

- The standard plans and specification, in MS Word. It is assumed the City will provide its standard plans and specifications for inclusion in the Plan.
- Water system organization chart and operator certifications.
- Public Works Emergency Response Plan.
- Cross-Connection Control Program.
- Route and preventive maintenance schedules for major system components.
- Water Shortage Response Plan and Service Reliability.

803. Summarize Remaining Useful Life. Summarize remaining useful life of water mains based on the Pipeline Asset Management Study completed by Carollo in 2014. Develop a future water main repair and replacement program based on the findings of the study.

804. Revise Chapter 7 – Operation and Maintenance. Update 2015 Chapter 7 based on information provided by the City. This may include organization, certification, O&M program activities updates, and known major deficiencies in the City's O&M program. A detailed evaluation of City O&M programs will not be conducted. An electronic version of draft 2020 Chapter 8 will be sent to the City for review and City comments will be recorded in the comment response log. Comments will be incorporated in the Chapter as part of the City Review Draft Plan. This task assumes that no hard copy of the chapter will be distributed.

Task 800 Assumptions

- City can provide elements listed under Task 802.
- This task will involve updating the chapter from the 2015 Plan.
- No hard copy of the chapter will be distributed.

Task 800 City Deliverables

1. Requested Data from Task 802.
2. Comments on Draft Chapter 8 – Operations and Maintenance.

Task 800 Consultant Deliverables

1. Meeting No. 7 – Operations & Maintenance Chapter Review Agenda, Materials, and Minutes.
2. Draft Chapter 8 – Operations and Maintenance.
3. ROC for Chapter 8 – Operations and Maintenance.

Task 800 Meetings

- Meeting No. 7 – Operations and Maintenance Chapter Review.

TASK 900 – CAPITAL IMPROVEMENT PLAN

This task will summarize the recommended improvements for the water system in accordance with the City's policies and criteria. This task will develop 2020 Chapter 9 – Capital Improvement Plan, which has been renumbered from the 2015 Plan due to changes in earlier chapters. Total project costs will be developed for each recommended improvement and ranked by priority. Tasks involved include the following activities:

TASK 900 ACTIVITIES

901. CIP Projects with Triggers. Identify and describe CIP projects from prior tasks and existing City planning. Prepare a description of each project. A recommended implementation date, with based on a quantitative project “trigger”, will be defined for each CIP project.

902. Cost Estimates. Develop planning level cost estimates for all recommended projects using costs provided in other planning efforts. Cost estimates for construction, engineering, permitting, and other contingencies will be prepared; all costs will be given in 2020 dollars.

903. Prioritization. Prioritize condition-related and capacity-related projects identified in the previous tasks for inclusion in the CIP in collaboration with the City in Meeting No. 8.

904. Electronic CIP. Develop an electronic CIP tool using Excel to assist the City with future budgeting. Each project will be listed on a separate tab including project description, justification, estimated cost, and recommended year for implementation. City staff will be provided the ability to adjust indirect costs and escalation factors. A copy of the electronic CIP will be provided to City staff. Hardcopies of the project cut-sheets will be included as an appendix. The Consultant will train City staff on using the CIP Tool.

905. Meeting No. 8 – Capital Improvement Plan. Facilitate meeting with City Staff to review the recommended CIP.

906. Create Draft Chapter 9 - Capital Improvements Plan. Prepare chapter including a description of cost estimating methods, project analysis, final recommendations, summary table, and system maps with the location of recommended improvements. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 9 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan. This task assumes that no hard copy of the chapter will be distributed.

Task 900 Assumptions

- This task will require a complete update of the Chapter with all new information.

Task 900 City Deliverables

1. Standard Construction Specification for Distribution Mains.
2. Comments on draft Chapter 9 – Capital Improvement Plan.

Task 900 Consultant Deliverables

1. CIP Cost Estimates
2. Draft Chapter 9 – Capital Improvement Plan.
3. ROC for Chapter 9 – Capital Improvement Plan.
4. Meeting No. 8 – Capital Improvement Plan Agenda, Materials, and Minutes.

Task 900 Meetings

- Meeting No. 8 – Capital Improvement Plan.

TASK 1000 – FINANCIAL PLAN

The purpose of this task is to develop 2020 Chapter 10 – Financial Plan, which has been renumbered from the 2015 Plan due to changes in earlier chapters. The City will lead Chapter 10, which will include an historical financial overview of the system and summarize current policies, rates, and fees. Ten-year projections of revenues and

expenses will be developed to identify the total cost of providing water service and implementing the capital improvement program. Potential funding sources for CIP projects will be identified.

TASK 1000 ACTIVITIES

1002. Meeting No. 9 – Financial Plan. Review financial analysis conducted by City Staff.

1003. Review and Format Draft Chapter 10 – Financial Plan. Review and format City prepared draft Chapter 10 for City's review and approval. Comments will be provided for City responses electronically

Task 1000 Assumptions

- This task will require a completed by the City

Task 1000 City Deliverables

1. R Draft Chapter 10 – Financial Plan.

Task 1000 Consultant Deliverables

1. Draft Chapter 10 – Financial Plan
2. Meeting No. 9 – Financial Review Agenda, Materials, and Minutes.

Task 1000 Meetings

- Meeting No. 9 – Financial Review.

TASK 1100 – PLAN INTEGRATION

The purpose of this task is to integrate all chapters and appendices into the full Plan for review and adoption by the City. This task includes review of all chapters for consistency with DOH's requirements for a Comprehensive Water System Plan per WAC 206-290-100.

TASK 1100 ACTIVITIES

1101. Executive Summary. Prepare an executive summary, summarizing each element of the Water System Plan.

1102. City Draft Plan. Prepare Cover Sheet and Table of Contents. Compile Chapters and develop Appendices. Incorporate comments into Draft Chapters based on City accepted ROCs. Prepare electronic review draft document for City Staff (one PDF copy).

1103. Meeting No. 10 – City Draft Plan. Meet with City to discuss comments of draft document. Incorporate comments to be included into Agency Draft Plan.

1104. Agency Draft Plan. Incorporate City comments into an Agency Draft plan to be submitted for agency review. Prepare three (3) hard copy and one PDF for distribution of Plan to Agencies and Adjacent Purveyors.

1105. Meeting No. 11 - Commission / Public Review. Attend a Commission meeting to support City Staff in gaining public comment and/or commission approval of the Plan, as selected by City staff. Aid City Staff in preparing technical materials for the meeting.

1106. Final Plan. Consultant will review agency review letters for incorporation into the Final Plan. Delivery of the Final Plan will include two PE-stamped notebook binders, one PDF, and all electronic deliverables.

Task 1100 Assumptions

- City provides required documents for appendices, including acceptance ordinances.
- It is anticipated that City will distribute the Plan to DOH, County agencies, and adjacent purveyors review for approval. The City will collect public and agency review comments and address all comments. The

Consultant will provide technical assistance, if required. City will develop written responses to comments received during Agency Review process.

Task 1100 City Deliverables

1. City Comments.
2. Public and Agency Review Comments.

Task 1100 Consultant Deliverables

1. Executive Summary.
2. City Draft Plan – One PDF.
3. Agency Draft Plan – Three hard copies and one PDF.
4. Final Plan – Two hard copies and one PDF.
5. Meeting No. 10 – City Draft Plan Agenda, Materials, and Minutes.
6. Meeting No. 11 – Commission / Public Review materials.

Task 1100 Meetings

- Meeting No. 10 – City Draft Plan.
- Meeting No. 11 – Commission / Public Review.

Comprehensive Water System Plan SUMMARY OF MEETINGS	
Meetings	Title
Meeting No. 1	Kick-off Meeting
Meeting No. 2	2015 Chapter 1 Review
Meeting No. 3	2020 Chapter 1 & 3 Review
Meeting No. 4	Existing System Chapter Review
Meeting No. 5	Demographic Analysis and Demand Projections Workshop
Meeting No. 6	Desktop Analysis Workshop
Meeting No. 7	System Improvements Workshop
Meeting No. 8	Water Use Efficiency Chapter Review
Meeting No. 9	Water Quality Chapter Review
Meeting No. 10	Operations and Maintenance Chapter Review
Meeting No. 11	Capital Improvement Plan
Meeting No. 12	Financial Review
Meeting No. 13	City Draft Plan
Meeting No. 14	Commission / Public Review

**Comprehensive Water System Plan
SUMMARY OF DELIVERABLES**

Deliverable	Notes (if applicable)
Project Management Plan	
All Meeting Agendas & Minutes	
Monthly Progress Reports (with invoices)	
Data Request Spreadsheet	
Draft and ROC for Executive Summary	
Draft Chapter and ROC for Chapter 1 – Introduction	Revision of chapter from 2015 Plan
Draft Chapter and ROC for Chapter 2 – Description of the Water System	Revision of chapter from 2015 Plan
Draft Chapter and ROC for Chapter 3 – Policies and Criteria	Revision of chapter from 2015 Plan
Draft Chapter and ROC for Chapter 4 – Water Requirements	Full chapter update
Draft Chapter and ROC for Chapter 5 – System Analysis	Full chapter update
Draft Chapter and ROC for Chapter 6 – Water Use Efficiency	Revision of chapter from 2015 Plan
Draft Chapter and ROC for Chapter 7 – Water Quality	Revision of chapter from 2015 Plan
Draft Chapter and ROC for Chapter 8 – Operations & Maintenance	Revision of chapter from 2015 Plan
Draft Chapter and ROC for Chapter 9 – Capital Improvement Plan	Full chapter update
Draft Chapter and ROC for Chapter 10 – Financial Plan	Full chapter update
City Draft Plan	
Agency Draft Plan	
Final Draft Plan & All Electronic Files	

EXHIBIT A
CITY OF TUKWILA
DRAFT SCOPE OF SERVICES
COMPREHENSIVE SANITARY SEWER PLAN

The following is a scope of work for the Comprehensive Sanitary Sewer Plan (Plan) for the City of Tukwila. The Plan will be completed by Carollo Engineers. However, some tasks and task elements will require the participation of City staff from the Planning, Finance, and Public Works Departments. This scope is developed to describe the content and purpose of the Plan, determine tasks to be completed for the update of the previous plan, and identify the resources necessary to accomplish those tasks.

The Plan will be based on the Washington Administrative Code (WAC) 173-240-050 standards. The plan will include a future flow projections, system analysis, and a capital improvements plan (CIP) for existing (2019), 10-year, and build-out scenarios. The 2013 Sewer System Plan Update (Carollo) will be used as the basis for this scope of work.

PROJECT ASSUMPTIONS

1. Carollo Engineers, Inc. and its subconsultants will be referred to as "Consultant" in this document.
2. The City of Tukwila and its staff will be referred to as "City" in this document.
3. All meetings will be held at City offices.
4. Draft Chapters will be provided in electronic copy (PDF and/or Microsoft Word) transmitted via email or secure file transfer.
5. City comments on draft chapters will be documented in the Project Comment Response Log by the Consultant. The Consultant will prepare responses to address the comments in the Comment Response Log for the City's review and acceptance. Resulting changes will be incorporated in the Draft Agency Review Plan, rather than reissuing a draft chapter at the time. However, revised draft chapters can be produced upon City required.
6. The Consultant will prepare an agenda, presentation materials, and document discussions, including action items and decisions, for Consultant-led meetings. Meeting notes and related materials will be transmitted electronically in MS Word and PDF formats via email.
7. The City will print and produce additional copies of all documents as necessary for its use.
8. The City will provide available information related to the project and as requested by the Consultant in a timely manner. The City shall furnish Consultant available studies, reports, and other data pertinent to Consultant's services; obtain, or authorize Consultant to obtain, or provide additional reports and data as required; furnish to Consultant services of others required for the performance of Consultant's services hereunder, and Consultant shall be entitles to use and rely upon all such information and services provided by the City or others in performing Consultant's services under this Agreement.

Comprehensive Sanitary Sewer Plan		
SUMMARY OF CHAPTERS AND APPENDICES		
Chapter / Appendix		Chapter Lead
Executive Summary		Consultant
Chapter 1:	Introduction	Consultant
Chapter 2:	Flow Monitoring	Consultant
Chapter 3:	Flow Projections	Consultant
Chapter 4:	Existing System	Consultant
Chapter 5:	System Analysis	Consultant
Chapter 6:	Operations and Maintenance	Consultant
Chapter 7:	Capital Improvement Plan	Consultant
Appendix A:	State Environmental Policy Act Checklist and Determination of Non-Significance	City
Appendix B:	Agency Review and Comment Letters	City
Appendix C:	Adopting Resolution	City
Appendix D:	King County WTD Conveyance Agreement	City
Appendix E:	System Map with Detailed Pipe	Consultant

TASKS

To meet the objectives of this Scope of Services, the Consultant shall complete the tasks as summarized in the table below and discussed in detail in the text that follows.

Comprehensive Sanitary Sewer Plan		
SUMMARY OF TASKS		
Task Number	Task Name	
Task 100	Project Management	
Task 200	Introduction	
Task 300	Flow Monitoring	
Task 400	Flow Projections	
Task 500	Existing System	
Task 600	System Analysis	
Task 700	Operation and Maintenance	
Task 800	Capital Improvement Plan	
Task 900	Plan Preparation	

The scope of services for the above project will consist of the following tasks.

TASK 100 – PROJECT MANAGEMENT

This task includes routine management activities, submittal of monthly progress reports, and overall coordination and assistance. It is anticipated that the Project will be complete by December 2020. Project timeline modifications may require project hour and budget modifications. This task includes the following activities:

TASK 100 ACTIVITIES:

101. Monthly Progress Reports. This subtask includes production and implementation of the project plan, schedule, and budget. Assist the project team members in the implementation of the task items, reviewing the work-in-progress reports. Prepare and submit monthly activity reports showing current project status and identifying key issues or elements of the project that will need to be addressed in the proceeding weeks. An electronic version of the monthly progress reports will be sent to the City for review and approval. This task assumes that no hard copy of the monthly progress reports will be distributed.

102 Project Management Plan. Prepare a Project Management Plan (PMP) that describes deliverables, Plan outline, anticipated meetings, project roles and responsibilities, lists contact information for the project team, describes communications protocols, quality management, and includes the scope of services, schedule, and budget. Quality Management includes, but is not limited to, the following elements:

- Project Manager overview of all primary documents to verify technical consistency and compliance with contract requirements.
- Organization of the work into logical deliverables with qualified staff for each task assigned to the work.
- Resolution of all review comments with a memorandum summarizing key comments and the manner in which each was addressed in the work.

An electronic version of the Project Management Plan will be sent to the City for review and approval. This task assumes that no hard copy of the Project Management Plan will be distributed.

103. Meeting No. 1 – Kick-off Meeting. Facilitate a kick-off meeting to review project management and initial data requests.

104. Client Coordination.

- Manage the consultant project team to track time and budget, work elements accomplished, work items planned for the next period, manpower, scope changes, time and budget needed to complete the project.
- Create and maintain a working project schedule based on the schedule in the PMP.
- Review project status, including scope, budget, and schedule.

Task 100 Assumptions

- The PMP will be updated with full incorporation of review comments after the City review of the draft PMP.
- The total length of the project is 14 months.
- City provides required documents for appendices.

Task 100 City Deliverables

1. Team member contact information.
2. PMP review for completeness.
3. Receive, review, and process Consultant invoices in a timely manner.
4. Respond to data requests in a timely manner.

Task 100 Consultant Deliverables

1. Draft request list.
2. Draft Plan outline.

3. Draft PMP.
4. Final PMP.
5. 14 monthly progress reports and invoices.

Task 100 Meetings

- Meeting No. 1 – Kick off Meeting.

TASK 200 – INTRODUCTION

This task includes basic information that will serve as a foundation for developing a comprehensive program to meet current and projected future sewer system needs. This task will develop *Chapter 1 Introduction*. The task includes the following activities:

TASK 200 ACTIVITIES

201. Meeting No. 2 - 2013 Chapter 1 Review. Facilitate a meeting to review and identify updates needed to Chapter 1 – Introduction. This may include: related comprehensive sewer plans from the neighboring jurisdictions and other related plans; recent history of the City's sewer, system background; and policy and criteria. A data request will be prepared based on the meeting.

202. Data Acquisition. Prepare a data request for the required information. The request may include, but is not limited to, the following:

- Related comprehensive sewer plans from the neighboring jurisdictions and other related plans.
- Agreements with neighboring jurisdictions.
- Neighboring/adjacent jurisdictions map, in Geographic Information System (GIS) format with current boundaries.
- GIS data for the sewer system including City Limits, current sewer service area, urban growth area (UGA), AutoCAD data for existing facilities, and interties.
- Service and Fiscal Policies related to service area and conditions of service, in MS Word. It is assumed the City will provide language for all requested changes to policies and criteria.
- Emergency Management goals, including redundancy and reliability standards related to system components, in MS Word.
- The standard plans and specification, in MS Word. It is assumed the City will provide its standard plans and specifications for inclusion in the Plan.

203. Revise Chapter 1 - Introduction. Prepare a revised Chapter 1 - Introduction based on City direction. It is anticipated that any revisions will be minor. An electronic version of draft Chapter 1 will be sent to the City for review and Consultant will address City comments in a comment response (ROC) log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan in Task 900.

Task 200 Assumptions

- City can provide elements listed under Task 202.
- This task will involve updating the chapter from the 2013 Plan.
- No hard copy of the chapter will be distributed.

Task 200 City Deliverables

1. Requested Data from Task 202.

2. Comments on draft Chapter 1 – Introduction.

Task 200 Consultant Deliverables

1. Draft Chapter 1 – Introduction.
2. ROC for Chapter 1 – Introduction.
3. Meeting Agendas and Minutes.

Task 200 Meetings

- Meeting No. 2 – 2013 Chapter 1 review.

TASK 300 – FLOW MONITORING

This Task will conduct and evaluate flow monitoring to allow accurate estimates of existing and future system flows, so that the City can adequately plan to accommodate its future sewer needs. This task will include flow monitoring of up to seven (7) locations by a Subconsultant. This task will be documented in *TM No. 1 – Flow Monitoring* that will be included as an Appendix of the Plan. The task includes the following activities:

TASK 300 ACTIVITIES

301. Review and Update Sewer Service Area and Basins. Review existing sewer service area and basins based on changes to parcels, collection system piping, and laterals information. It is anticipated the City will provide updated information electronically. Update Sewer Basins and provide an updated map for City review and confirmation.

302. Identify Primary Collectors and Lift Stations. The City will identify primary collectors and lift stations for potential flow monitoring and inclusion in the hydraulic model (Task 600). It is anticipated the collectors will be "skeletonized" to only include pipes greater than 12-inch and 8-inch pipes needed to represent flow conditions from sewer basins. To assist with future tasks, the City will need to provide invert elevations for the selected primary collectors and information on Lift Stations.

303. Identify Flow Monitoring Locations. Identify recommended locations in install temporary flow monitoring devices in the gravity system at up five (5) locations to measure primary collectors and or Lift Stations south of I-405. An additional two (2) flow monitors on primary collectors or lift stations will be added north of I-405, as directed by the City. Flow monitoring locations will be provided to the City to confirm their suitability for meter installation.

304 - Flow Monitoring ADS will provide temporary flow monitoring services to **Consultant** to collect three (3) months of flow data up to seven (7). After completion of the monitoring, ADS will provide a Rain Dependent Inflow & Infiltration (RDI/I) Analysis and an electronic report. The work will be performed in three phases as set forth below:

a. **Phase I - Mobilization**

1. Site Locations - ADS will work with the Consultant and the City to identify/verify the seven (7) locations for monitor installations. Upon approval by the City, additional locations may be added per the optional costs in the budget.
2. Site Investigation - Once the installation sites are provided to ADS, ADS field crew(s) will perform site investigations. ADS will utilize a standard two (2) person field crew for fieldwork and comply with Federal standards for confined-space entry. The proposed flow monitoring location will be located, inspected, and verified for hydraulic suitability. ADS will also check for debris in the manhole that could impact data quality and coordinate any required cleaning efforts with the City.

ADS field crews will look for evidence and signs of erratic flow patterns. ADS will also investigate adjacent manholes in order to identify the best monitoring locations.

3. Site Reports - Site reports will be generated upon completion of the site investigations. The site reports will include a sketch of the general location, physical characteristics and diameters of the proposed monitoring locations, manhole depths, flow measurements, and other comments pertinent to the location such as any special traffic or safety issues. Final site locations to be approved by the Consultant.
4. Equipment - ADS will utilize wireless ADS® Model Triton+™ flow monitors during the course of this project. A typical monitor installation will include an ultrasonic depth sensor that will be mounted at the invert of the pipe, a redundant pressure depth sensor; and a Doppler velocity sensor also mounted at or near the invert.
5. Monitor Activation - Once installed, the monitor will be activated and set to take readings at 5-minute intervals. ADS Field crews will take manual depth readings with a ruler and velocity readings with a portable, instantaneous velocity meter in order to confirm the monitor is collecting accurate data based on the actual existing hydraulic conditions at each location.

b. **Phase II - Flow Monitoring**

1. Flow Monitoring - Once the monitors are installed and verified to be in working order, ADS will monitor for a period of four (4) calendar months ("monitoring period"). This initial monitoring period can be extended based on mutual consent and written agreement of additional work and price for such additional work. Anticipated flow monitoring locations are listed in Table 1. Upon approval of the City, the flow monitoring may be extended by up to two months per the optional costs in the budget.
2. Data Collection and Equipment Maintenance - ADS will collect data from each monitoring location remotely using telemetry on a daily schedule (for sites with good wireless signal). The ADS project team will review the data weekly to ensure each monitor is running properly meeting the project objectives as well ADS standards. ADS Field Crews will perform site confirmations, site maintenance which may include, cleaning the sensor(s), moving, changing or replacing any failed component at each monitor location.
3. Demobilization - Field crews will continue data collections and confirmations (as necessary) until the end of the monitoring period. Once authorized, crews will immediately begin removing the flow monitors and deliver final data to the data analyst.

c. **Phase III - Data Editing, Analysis and Reporting**

1. Data Analysis - Upon completion of the monitoring period, a trained ADS Data Analyst will begin to finalize the data collected for each monitoring location. The data analyst will directly calculate flow using the continuity equation from recorded depth and average velocity data. Flow quantities as determined by the continuity equation will be plotted.
2. Slicer RDI/I Analysis - For each of the flow monitoring location, the analysis will characterize the average dry weather flow conditions and RDI/I calculations for all significant wet weather events, an assessment of hydraulic performance under such conditions. The results of dry weather and wet weather performance will be plotted on maps of the sewer sheds to make it easier to understand where RDI/I originates. The Slicer.com section of the Report will include the following items:
 - *Dry Weather Analysis* – A characterization of the conditions observed during weekday and weekend periods of the flow monitoring period during dry weather periods, excluding periods of extended system recovery to previous rain events. Summarized as a time-series hydrograph of the average diurnal flow quantities for weekday and weekend dry weather periods.

- *Dry Weather Flow Summary* – A table of the Average Dry Day Flow (ADDF) and an estimation of Base Infiltration (BI). Average dry weather diurnal patterns will be provided for each flow monitoring location during weekday and weekend portions of the monitoring period.
 - *Wet Weather Analysis* – A characterization of the conditions observed during specific wet weather events observed during the flow monitoring period, summarized as a time-series hydrograph comparing observed flow quantities to average diurnal flow quantities for corresponding weekday and weekend dry weather periods.
 - *Wet Weather Summary* – A characterization of the conditions observed during the maximum rain event of the monitoring period. This can be summarized as the maximum 30 minute average peaking factor observed during the flow monitoring period.
 - *Wet Weather Prioritization* – A column chart of the Rain Dependent Inflow/Infiltration (RDI/I) determined for each flow monitoring location for each wet weather event. Column chart provides a prioritized ranking based on net RDI/I (as percent rain ingress if basin acreages are provided) or net RDI/I per linear foot of sewer per inch of rain when linear footage information is provided to ADS.
 - *Hydraulic Performance Evaluation* – A narrative interpretation of hydraulic performance recorded at each flow monitoring location as determined using a scattergraph of flow depth and velocity data. The scattergraph interpretation shall evaluate the ability of each flow monitoring location to accommodate flow quantities observed during dry weather and wet weather conditions observed during the monitoring period.
1. Data Delivery and TM No. 2 – Flow Monitoring Summary - ADS will prepare a Final TM to include electronic data of the flow data in tabular, hydrograph, scattergraph, and a RDI/I report in electronic format.
 2. Meeting No. 22 – Flow Monitoring Summary - Facilitate a workshop with City Staff to review the results and conclusions drawn from the flow monitoring.

305. Rainfall Data Review. Obtain and process hourly rainfall data corresponding to the monitoring period from the NOAA SEATAC Airport weather station.

306. Flow Monitoring Data Review. It is anticipated that data will be available from up to seven (7) monitoring locations for the 2019/2020 winter. The data quality for the events will be evaluated for each meter and reviewed with the City. Flow monitoring data will also be reviewed to identify storm events that lead to wet weather flows in the collection system and are suitable for wet weather model calibration. The rainfall for these specific events will be compared with the rainfall record to assess the individual storm sizes return periods. Ideally data will be available for three to five storms. Wet weather flows, R-Factors and I/I rates will be calculated for each meter or SCADA source for up to three storm events. The flow monitoring data analysis will result in modified wet weather modeling parameters that will be used in the hydraulic model.

307. Meeting No. 3 - Flow Monitoring Review. Facilitate a workshop with City staff to review the findings of the Flow Monitoring.

308. Draft Chapter 2 – Flow Monitoring. Consultant will summarize the results of the flow monitoring and data review in Chapter 2: Flow Monitoring. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 2 will be sent to the City for review and Consultant will address City comments in a comment response (ROC) log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan in Task 900.

Task 300 Assumptions

- This task will require a complete update of the Chapter with all new information.

- No hard copy of the draft chapter will be distributed.

Task 300 City Deliverables

1. Requested Data.
2. Review of Draft TM No.1 – Flow Monitoring.
3. Review of Draft Chapter 2 – Flow Monitoring.

Task 300 Consultant Deliverables

1. Draft and Final TM No.1 – Flow Monitoring.
2. Draft Chapter 2 – Flow Monitoring.
3. ROC for Chapter 2 – Flow Monitoring.
4. Meeting Agendas and Minutes.

Task 300 Meetings

- Meeting No. 3 – Flow Monitoring Review.

TASK 400 – FLOW PROJECTIONS

The objective of this task is to develop the sewer flow projections for the sewer service area for the current (2019), 10-year, and build-out (maximum density) scenarios. Sewer flows will be based on the flow monitoring in Task 300 and the City's demographic projections. A new hydraulic model will be created and used to estimate future wet weather flows. The model will include the developed area south of I405 and up to two (2) sewer basins north of 405. This will not be an all pipe model of the system. The information developed in this task will become Chapter 3 - Flow Projections. This task includes the following activities:

TASK 400 ACTIVITIES

401. Data Acquisition. Data requests will be provided at the kick-off meeting and as needed throughout the project. The City will provide:

- Current I/I program.
- Summary of I/I projects completed since the 2013 Plan.
- Sewer connections by customer class.
- Sewer conservation flow reduction rate.
- Map with direct connections to King County wastewater system.
- Data on number, horsepower, capacity, design point for all pumps at the City's Lift Stations.
- Lift Stations run time.
- City Planning Department existing and future populations and employment based on PSRC's 2040 Vision demographic projections and more current planning for the service area. These growth rates for the 10-year scenario will be consistent with the Comprehensive Water Plan.
- GIS Data: land use, zoning data within the City Limits, sewer service area and UGA. It is assumed that these data will be provided in GIS format.
- GIS Data: existing facilities (pipes, manholes, lift stations, connections with King County, etc.), and interties.

402. Update Service Area, Land Use, and Zoning. Based on City provided data, update mapping and descriptions of existing and future service areas, land use, and zoning for the City Sewer Service Area. The Plan will include both figures and text.

403. Demographic Projections. Allocate the existing and 10-year and build-out projection of sewer population and employment provided by the City Planning Department to Sewer Basins. The 10-year growth rates will be consistent with the Comprehensive Water Plan. The build-out projections are anticipated to be based on Comprehensive Plan land use.

404. Design Storm. A design storm has been developed from a long term historical rainfall record at a number of sites near the City. Rainfall data from the ongoing city monitoring program will be reviewed and evaluated to determine if the design storm previously identified for wet weather flow modeling should be revised. The more recent data will also be used to evaluate any local rainfall variability and trends. This review will be prepared to provide the City with a defensible "Design" storm that emulates local weather patterns

405. Develop Existing Dry Weather Flows by Basin. Utilize existing land use maps to develop or confirm average dry weather flows (ADWF) for the modeled sewer basins. The flows will be confirmed with the flow monitoring data as well as the available flow data from the lift stations. Existing land use and currently served areas will be used to estimate flow factors per acre per land use category. The flow factor will be customized to match the observed existing ADWF and will be used to develop flow projections. For basins without measured flow data, flow factors will be assigned from a measured basin with similar land use characteristics.

406. Develop 10-year and Build-out Dry Weather Flows by Basin. The City's comprehensive plan and any additional information on housing densities, commercial and industrial uses will be used along with the flow factors developed in the above task to determine the ultimate development acreage and the ADWF for build-out conditions for up to sewer collection system.

407. Create Hydraulic Model. Using the most recent information from the City's GIS data, create a sewer system hydraulic model using Innowyze InfoSWMM software. The model will include the developed area south of I405 and up to two (2) sewer basins north of 405. The model will include lift stations and primary collectors, and does not include the laterals, branches, or smaller truck sewers serving individual parcels within the basins. The City's existing GIS ArcView ".shp" files will be used to import the collection system data into the hydraulic model. If not available in the GIS, the City will provide invert elevations at key locations to construct the model. Add lift station controls provided by the City to simulate realistic lift station operation. Estimate likely boundary conditions at connections King County transmission mains, as required.

The up to seven (7) basins associated with flow monitoring will be further divided into mini-basins for sanitary and wet weather loading in the model. These mini-basins will group parcels that contribute to common branches and trunks, and will be connected to the modeled primary collector or lift station at the appropriate location.

408. Meeting No4 - Hydraulic Model Creation. Facilitate a meeting with City staff to review and confirm the elements of the hydraulic model. City staff may be requested to perform field verification of model elements based on this meeting.

409. Calibrate Existing Dry Weather and Wet Weather Flows. The existing dry and wet weather flows will be calibrated based upon the flow monitoring data, and rainfall data provided by the City as well as additional data available from the City's SCADA system for up to seven (7) locations in the collection system. Existing flow depths and velocities will also be checked and calibrated.

The first step is to calibrate the model to dry weather flow conditions. Flow monitoring data will provide custom hourly diurnal curves that establish the daily flow patterns for each metering basin. Model results will be compared to measured flows to check for agreement between model results and measured flows. Model parameters will be adjusted, as needed, to best match the flow monitoring and SCADA data. It is assumed that the City will provide SCADA data in electronic format.

Once the dry weather calibration is completed, the wet weather calibration is conducted. Rainfall information will aid in developing the required rainfall-derived infiltration/inflow (RDI/I) estimations that enter the collection system during a storm event. Wet weather calibration consists of using three storms that occurred during the flow monitoring period. It is recommended that the use of a single calibration period incorporating a number of independent rainfall events should be considered whenever possible. Model results will be reviewed and adjusted, as needed, to best match the flow monitoring, rainfall and SCADA data.

The flows from unmetered basins will be developed as best possible using a mass balance between the available data, and proportioned as best as possible based on development type, age, pipe material, and extent of collection system components.

The hydraulic model will be calibrated in accordance with international modeling standards. The Urban Drainage Group from the Chartered Institution of Water and Environmental Management (CIWEM) has established generally agreed upon principles for model verification. The dry weather and wet weather calibration will focus on meeting the recommendations on model verification contained in the "Code of Practice for the Hydraulic Modelling of Urban Drainage Systems," published by CIWEM (November 2017).

410. Meeting No. 5 - Model Calibration. Consultant will conduct a workshop (Meeting No. 5) with the City to summarize the model calibration results. Consultant will present the model calibration results for both dry and wet weather scenarios. Summary tables will be presented that quantify the percent difference between the measured data and the modeling results. Consultant will discuss calibration standards and confidence levels at the workshop.

411. Hydraulic Model Creation and Calibration TM No.2. Consultant will summarize the model creation and calibration in a Draft and Final TM. An electronic version of draft TM will be sent to the City for review and address City comments in a Final TM that will be included as an Appendix to the Plan.

412. Develop Existing, 10-year and Build out Wet Weather Flow. The calibrated model will be used to determine the existing, 10-year, and build out flows peak wet weather flows for the sewer service area. Wet weather flows will be based on the selected design storm.

413. Reclaimed Water. As required by Ecology, reclaimed water opportunities will be updated. The City currently uses reclaimed water from King County's South Treatment Plant. The City's current use and potential future customers will be summarized based on information provided by the City. No new analysis is anticipated for this effort.

413. Draft Chapter 3 – Flow Projections. Consultant will summarize the sewer flow projections in Chapter 3: Flow Projections. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 3 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 400 Assumptions

- City can provide elements listed under Task 401.
- This task will require a complete update of the Chapter with all new information.
- No hard copy of the draft chapter will be distributed.

- The model will include the developed area south of I405 and the primary interceptors north of 405. This will not be an all pipe model of the system.

Task 400 City Deliverables

1. Requested Data.
2. Field verification of model elements, as required.
3. Comments on TM No. 2 – Hydraulic Model Creation and Calibration
4. Comments on Chapter 3 – Flow Projections.

Task 400 Consultant Deliverables

1. Draft and Final TM No. 2 – Hydraulic Model Creation and Calibration.
2. Draft Chapter 3 – Flow Projections.
3. ROC for Chapter 3 – Flow Projections.
4. Meeting Agendas and Minutes.

Task 400 Meetings

1. Meeting No. 4 – Hydraulic Model Creation.
2. Meeting No. 5 – Hydraulic Model Calibration.

TASK 500 – EXISTING SYSTEM

The objective of this task is to summarize the existing sewer system facilities and components including lift stations, and interties. This task includes the following activities:

TASK 500 ACTIVITIES

501. Meeting No.6 - 2013 Chapter Review. Facilitate a meeting to review and identify updates needed to Chapter 4 – Existing System. A data request will be prepared based on the meeting.

502. Data Acquisition. A data request will be provided for required information for this task. The request may include, but is not limited to, the following:

- Data on pipeline materials and age by linear foot, as available.
- Existing renew and replacement program.
- Summary of improvements completed since the 2013 Plan.
- SCADA data for sewer system.

503. Update Existing Sewer System. Update the components of the major sewer collectors and pump stations using City provided information. This may include changes to boundaries of sewer service basins, lift stations and force mains, and the total length of pipe based on diameter and material. Summarize improvements to the City's wastewater collection system that have been completed since the 2013 Plan. Develop new system map.

504. Draft Chapter 4 – Existing System. Consultant will summarize the existing system in Chapter 4. An electronic version of draft Chapter 4 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 500 Assumptions

- City can provide elements listed under Task 502.
- This task will involve updating the chapter from the 2013 Plan.
- No hard copy of the chapter will be distributed.

Task 500 City Deliverables

1. Requested Data
2. Comments on Chapter 4 – Existing System.

Task 500 Consultant Deliverables

1. Draft Chapter 4 – Existing System.
2. ROC for Chapter 4 – Existing System.
3. Meeting Agendas and Minutes.
4. System Map – Appendix E

Task 500 Meetings

- Meeting No. 6 – 2013 System Review.

TASK 600 – CONVEYANCE SYSTEM ANALYSIS

The objective of this task is to evaluate the capacity of the conveyance system to convey existing and future flows during the City's design storm. This task will form the basis for *Chapter 5 - Conveyance System Analysis* of the Plan. The capacity assessment will be conducted for the collection system included in the hydraulic model and at lift stations. This task will develop recommended improvements to the system in support of a CIP for 10-year and build-out scenarios. This task includes the following activities.

TASK 600 ACTIVITIES:

601. Collection System Analysis. After the model has been calibrated, the design storm will be routed through the modeled collection system capacity to evaluate capacity during existing, 10-year and build-out conditions. Evaluate capacity deficient segments and identify bottlenecks or other system limitations. Identify improvements to resolve deficiencies using the hydraulic model. All improvements will be confirmed using the hydraulic model.

602. Lift Station Capacity Analysis. Evaluate the existing lift stations capacity based on flow estimates for the design storm. The current performance of the existing lift stations, as provided by the City, will be compared to the modeled peak flows to confirm capacity during the existing, 10-year, and build-out scenarios. Required upgrades/modifications will be recommended, as necessary, to address lift station capacity deficiencies.

603. Meeting No. 7 - Capacity Analysis. Facilitate a meeting with City Staff to review the results of the collection system and Lift analysis, as well as initial recommended improvements.

604. Lift Station Operational Analysis and Meeting No.8. Conduct a high-level evaluate up to three existing lift stations operational and hydraulic performance to determine if improvements are needed to the Lift Stations. The evaluation will focus on hydraulic capacity, redundancy, facility reliability, and operational considerations, such as wet well sizing. Conduct a site visit of the selected Lift Stations (Meeting No. 8) to document existing infrastructure (Assumed half day site visit). Formulate conceptual Alternatives to address identified issues. Planning level costs, technical considerations and operation and maintenance issues will be compared to develop a recommended alternative. Results of this task will be incorporated into the CIP.

605. Draft Chapter 5 - Conveyance System Analysis. Chapter 5 will document the conveyance system analysis including the recommended improvements to the system. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 5 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 600 Assumptions

- City can provide any data requested.

- This task will require a complete update of the Chapter with all new information.
- No hard copy of the chapter will be distributed.

Task 500 City Deliverables

1. Requested Data.
2. Comments on Chapter 5 – Conveyance System Analysis.

Task 600 Consultant Deliverables

1. Draft Chapter 5 – Conveyance System Analysis.
2. ROC for Chapter 5 – Conveyance System Analysis.
3. Meeting Agendas and Minutes.

Task 600 Meetings

3. Meeting No. 7 – Conveyance System Analysis.
4. Meeting No. 8 – Lift Stations Site Visit.

TASK 700 – OPERATION AND MAINTENANCE

The objective of this task is to assure satisfactory management of sewer system operations. It will provide an overview of the sewer system responsibility and authority, system operation and maintenance plan, equipment supplies and inventory, and emergency response. The City may need to update its existing emergency response plan that will be included as an appendix to the Comprehensive Plan. This task includes the following activities:

TASK 700 ACTIVITIES

701. Meeting No. 9 – O&M Chapter Review. Facilitate a meeting to review and identify updates needed to Chapter 6 – O&M. A data request will be prepared based on the meeting.

702. Data Acquisition. Data requests will be provided at the kick-off meeting and as needed throughout the project. The City will provide:

- Copy of the organization chart.
- Copy of the FOG control program.
- Copy of the overflow emergency response plan.
- Current operations and maintenance program activities.

703. Collection System and Lift Station Condition and Maintenance Summary. The City’s reported condition and maintenance problems will be summarized. Review basins identified with high I/I for potential causes of I/I including a history of repairs, and pipe age and material. Discuss I/I causes with City operation staff. Review the existing I/I program. Summarize completed projects. Identify or update I/I reduction goals. Document pipes with known maintenance issues, such as accumulation of solids, FOG build up, or root intrusion. A GIS map will be created, identifying the location of these pipe segments. General pipe replacement timing based on Remaining Useful Life will be based on prior analyses. Document City concerns with condition or maintenance of Lift Stations. No site visits will be completed during this task. Information for this task will be provided by the City electronically or during Meeting No. 7.

704. Update Chapter 6 – Operations and Maintenance. Update Chapter 6 based on information provided by the City. This may include updates to organization chart, certification, and collection system and lift station maintenance, O&M program activities, and known major deficiencies in the City’s operation and maintenance

(O&M) programs. This task does not include a FOG ordinance or program, overflow emergency response plan, a detailed O&M Manual, or maintenance management system. A detailed evaluation of City O&M programs will not be conducted. An electronic version of draft Chapter 6 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 700 Assumptions

- City can provide elements listed under Task 702.
- This task will involve updating the chapter from the 2013 Plan.
- No hard copy of the chapter will be distributed.

Task 700 City Deliverables

1. Requested Data from Task 702.
2. Comments on Draft Chapter 6 – Operations and Maintenance.

Task 700 Consultant Deliverables

1. Draft Chapter 6 – Operations and Maintenance.
2. ROC for Chapter 6 – Operations and Maintenance.
3. Meeting Agenda and Minutes

Task 700 Meetings

- Meeting No. 9 – 2013 Chapter Review.

TASK 800 – CAPITAL IMPROVEMENT PLAN

This Task will summarize the recommended improvements for the conveyance system and lift stations in accordance with the City's Policy and Criteria. This task will develop Chapter 7 Capital Improvement Program for the Plan. Total project costs will be developed for each recommended improvement and ranked by priority. This task includes the following activities:

TASK 800 ACTIVITIES

801. CIP Projects. Identify and describe CIP projects from prior tasks and existing City planning. Prepare a description of each project.

802. Cost Estimates. Develop planning level cost estimates for all recommended projects using costs provided in other planning efforts. Cost estimates for construction, engineering, permitting, and other contingencies will be prepared; all costs will be given in 2019 dollars.

803. Prioritization. Prioritize condition-related and capacity-related projects identified in the previous tasks for inclusion in the CIP into 10 year and long term scenarios

804. Meeting No. 10 – CIP Review. Facilitate a meeting with City staff to review and verify CIP projects, costs and prioritization

805. Electronic CIP. Develop an electronic CIP tool using Excel to assist the City with future budgeting. Each project will be listed on a separate tab including project description, justification, estimated cost, and recommended year for implementation. City staff will be provided the ability to adjust indirect costs and escalation factors. A copy of the electronic CIP will be provided to City staff. Hardcopies of the project cut-sheets will be included as an appendix. The Consultant will train City staff on using the CIP Tool.

806. Financial Summary. Summarize Sewer Utility financial information per WAC requirements. City to provide a discussion cost per service in terms of both debt service and operation and maintenance costs, of all existing facilities. Carollo will estimate additional costs for future facilities recommended during the planning period. This summary does not include an analysis of rates, connection charges, or methods to fund the recommended CIP.

807. Meeting No. 11 – Financial Review. Facilitate a meetings with City Staff to review the financial summary and update priority of CIP projects, as required.

808. Draft Chapter 7. Prepare Chapter 7 - Capital Improvements Plan, including a description of cost estimating methods, project analysis, final recommendations, summary table, and system maps with the location of recommended improvements. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 7 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan. This task assumes that no hard copy of the chapter will be distributed.

Task 800 Assumptions

- City can provide any data requested.
- This task will require a complete update of the Chapter with all new information.
- No hard copy of the chapter will be distributed.

Task 800 City Deliverables

1. Requested Data.
2. Comments on Chapter 7 – Capital Improvement Plan.

Task 800 Consultant Deliverables

1. Draft Chapter 7 – Capital Improvement Plan.
2. ROC for Chapter 7 – Capital Improvement Plan.

Task 800 Meetings

- Meeting No. 10 – Capital Improvement Plan.
- Meeting No. 11 – Financial Review.

TASK 900 – PLAN PREPARATION

This Task will include the compilation of all previous tasks. Carollo will prepare a final Comprehensive Sewer Plan that is the compilation of the chapters that have been created as a part of the project, with revisions based on feedback provided by the City throughout the project. The Comprehensive Sewer Plan will comply with WAC 173-240-050. This task includes the following activities:

TASK 900 ACTIVITIES

901. Executive Summary. Carollo will prepare an executive summary, summarizing each element of the Comprehensive Plan.

902. Prepare Staff Review Draft. Incorporate comments from draft chapters. Compile Chapters and develop Technical Appendices. Prepare review draft document for City Staff in one (1) notebook binder copies and an electronic copy.

903. Meeting No. 12 – Staff Review Draft. Meet with City to discuss comments on the Staff Review draft Plan. Comments to be incorporated into SEPA/Agency Review Draft.

904. Meeting No. 13 – Council Review. Assist the City in presenting the findings of the Plan to Council. Carollo will prepare a power point summarizing the Plan’s key points and attend the Council session to support City Staff. It is anticipated the Council presentation will be no longer than 30 minutes.

905. Prepare Agency Review Draft. Prepare three (3) hard copies and one electronic version for the City to distribute for agency review. This task assumes the City will lead the Agency Review process. The City will complete the SEPA review process and obtain approval during the Agency Review period. Carollo will assist City in responding to written comments by regulatory agencies, neighboring jurisdictions, and the public, including no more than three letters. No meetings are anticipated for this task. Additionally, no major plan revisions are included in the scope based on Agency Review comments.

906. Meeting No. 14 – Agency Review Comments. Meet with City to discuss comments on the Agency review comments. A response to comment log will be formulated based on the meeting.

907. Prepare Final Comprehensive Sewer Plan. Incorporate final comments based on agency reviews, as requested by the City. Provide City with three (3) signed and stamped Final Comprehensive Sewer Plans and one electronic version for the City’s use. This task assumes only the documents above will be developed for the Plan approval and any other interim draft plan documents are considered out of scope.

Task 900 City Deliverables

1. City Comments.
2. Public and Agency Review Comments.

Task 900 Consultant Deliverables

1. Executive Summary.
2. City Draft Plan – One PDF.
3. Agency Draft Plan – Three hard copies and one PDF.
4. Final Plan – Two hard copies and one PDF.
5. Comment Response Log.

Task 900 Meetings

- Meeting No. 12 – Staff Review Plan Review.
- Meeting No. 13 – Council Review
- Meeting No. 14 – Agency Review Comments.

Comprehensive Sanitary Sewer Plan SUMMARY OF MEETINGS	
Meetings	Title
Meeting No. 1	Kick-off Meeting
Meeting No. 2	2013 Chapter 1 Review
Meeting No. 3	Demographic Analysis Meeting
Meeting No. 4	Flow Projections and I&I Evaluations
Meeting No. 5	Existing System Review
Meeting No. 6	System Analysis
Meeting No. 7	Operations and Maintenance Chapter Review
Meeting No. 8	Capital Improvement Plan
Meeting No. 9	Financial Review
Meeting No. 10	Plan Review

Comprehensive Sanitary Sewer Plan SUMMARY OF DELIVERABLES	
Deliverable	Notes (if applicable)
Project Management Plan	
All Meeting Agendas & Minutes	
Monthly Progress Reports (with invoices)	
Data Request Spreadsheet	
Draft and ROC for Executive Summary	
Draft Chapter and ROC for Chapter 1 – Introduction	Revision of chapter from 2013 Plan
Draft Chapter and ROC for Chapter 2 – Demographic Analysis	Full chapter update
Draft Chapter and ROC for Chapter 3 – Flow Projections	Full chapter update
Hydraulic Model	New
Draft Chapter and ROC for Chapter 4 – Existing System	Revision of chapter from 2013 Plan
Draft Chapter and ROC for Chapter 5 – System Analysis	Full chapter update
Draft Chapter and ROC for Chapter 6 – Operations & Maintenance	Revision of chapter from 2013 Plan
Draft Chapter and ROC for Chapter 7 – Capital Improvement Plan	Full chapter update
City Draft Plan	
Agency Draft Plan	
Final Draft Plan & All Electronic Files	

EXHIBIT C, Cost Estimate
Water System Plan Update

DRAFT

TASK / DESCRIPTION	PM		QM		PE		Staff Prof		GIS		WP		Total Hours	Carollo Labor Cost	OTHER DIRECT COSTS		TOTAL COST								
	DLR	LRK	LRK	AT	AT	NLR	Varies	Varies	Varies	Varies	Travel and Printing	PECE			Total ODC										
Total Labor Rate \$ 176 \$ 226 \$ 152 \$ 132 \$ 137 \$ 95																									
Task 100 - Project Management																									
101	36	9										18	63	\$ 10,080	\$ -	\$ 756	\$ 756	\$ 10,836							
102	3				5							2	10	\$ 1,378	\$ -	\$ 120	\$ 120	\$ 1,498							
103	3				4							1	8	\$ 1,151	\$ 15	\$ 96	\$ 111	\$ 1,262							
104	36	9										45	45	\$ 8,370	\$ -	\$ 540	\$ 540	\$ 8,910							
Subtotal - Task 100	78	18	0	9	0	21						126	126	\$ 20,979	\$ 15	\$ 1,512	\$ 1,527	\$ 22,506							
Task 200 - Introduction																									
201	3				4							1	8	\$ 1,151	\$ 15	\$ 96	\$ 111	\$ 1,262							
202	2				4							4	10	\$ 1,428	\$ -	\$ 120	\$ 120	\$ 1,548							
203	1				4							2	7	\$ 884	\$ -	\$ 84	\$ 84	\$ 978							
204	3	1			12							4	20	\$ 2,718	\$ -	\$ 240	\$ 240	\$ 2,958							
Subtotal - Task 200	9	1	0	24	4	7						45	45	\$ 6,191	\$ 15	\$ 540	\$ 555	\$ 6,746							
Task 300 - Existing System																									
301	3				4							1	8	\$ 1,151	\$ 15	\$ 96	\$ 111	\$ 1,262							
302	1				4							4	9	\$ 1,252	\$ -	\$ 108	\$ 108	\$ 1,360							
303	2	1			8							4	21	\$ 2,836	\$ -	\$ 252	\$ 252	\$ 3,088							
Subtotal - Task 300	6	1	0	16	10	5						38	38	\$ 5,239	\$ 15	\$ 456	\$ 471	\$ 5,710							
Task 400 - Demographic Analysis and Demand Pro																									
401	2				4								6	\$ 880	\$ -	\$ 72	\$ 72	\$ 952							
402	2				24							8	34	\$ 4,616	\$ -	\$ 408	\$ 408	\$ 5,024							
403	4				40							8	52	\$ 7,080	\$ -	\$ 624	\$ 624	\$ 7,704							
404	3				4							1	8	\$ 1,151	\$ 15	\$ 96	\$ 111	\$ 1,262							
405	2				8								10	\$ 1,408	\$ -	\$ 120	\$ 120	\$ 1,528							
406	4	2			24							4	38	\$ 5,252	\$ -	\$ 456	\$ 456	\$ 5,708							
Subtotal - Task 400	17	2	0	104	20	5						148	148	\$ 20,387	\$ 15	\$ 1,776	\$ 1,791	\$ 22,178							

EXHIBIT C. Cost Estimate
Water System Plan Update

DRAFT

TASK / DESCRIPTION	PM DLR	QM LRK	PE AT	Staff NLR	Prof Varies	GIS Varies	WP Varies	Total Hours	Carollo Labor Cost	OTHER DIRECT COSTS		TOTAL COST
										Travel and Printing	PECE	
										\$12.00	Total ODC	
Task 500 - System Analysis												
501 Data Request	1			2				3	\$ 440	\$ -	\$ 36	\$ 476
502 Update Hydraulic Profile	1		2		6			9	\$ 1,302	\$ -	\$ 108	\$ 1,410
503 Water Right Self-Assessment	1		2					3	\$ 480	\$ -	\$ 36	\$ 516
504 Desktop Analysis - Water Supply Analysis	1		2					3	\$ 480	\$ -	\$ 36	\$ 516
505 Desktop Analysis - Storage Analysis	4		12					16	\$ 2,528	\$ -	\$ 192	\$ 2,720
506 Desktop Analysis - Pump Station Analysis	1		2					3	\$ 480	\$ -	\$ 36	\$ 516
507 Desktop Analysis - Limiting Factor Analysis	2		6					8	\$ 1,264	\$ -	\$ 96	\$ 1,360
508 Meeting No. 5 - Desktop Analysis Workshop	3	3	4				1	11	\$ 1,909	\$ 15	\$ 132	\$ 2,056
509 Update Hydraulic Model/Calibration	1	4		36	8			49	\$ 6,928	\$ -	\$ 588	\$ 7,516
510 Future Storage Location	16	2	8	40	8			74	\$ 10,880	\$ -	\$ 888	\$ 11,748
511 Fire and System Pressure Analysis	1	2		16	4			23	\$ 3,288	\$ -	\$ 276	\$ 3,564
512 Identification of Water Improvement Projects	4	4		24	8			40	\$ 5,872	\$ -	\$ 480	\$ 6,352
513 Meeting No. 6 - System Improvements Workshop	3			4			1	8	\$ 1,151	\$ 15	\$ 96	\$ 1,262
514 Draft Chapter 5 - System Analysis	6	4	6	24	4	4		48	\$ 6,968	\$ -	\$ 576	\$ 7,544
Subtotal - Task 500	45	19	44	146	38	6		298	\$ 43,950	\$ 30	\$ 3,576	\$ 47,556
Task 600 - Water Use Efficiency												
601 Data Acquisition				2				2	\$ 264	\$ -	\$ 24	\$ 288
602 Revise Chapter 6 - Water Use Efficiency	2	1		16	2	4		25	\$ 3,344	\$ -	\$ 300	\$ 3,644
Subtotal - Task 600	2	1	0	18	2	4		27	\$ 3,608	\$ -	\$ 324	\$ 3,932
Task 700 - Water Quality												
701 Data Acquisition			2					2	\$ 304	\$ -	\$ 24	\$ 328
702 Revise Chapter 7 - Water Quality	2	1	16	2	4			25	\$ 3,664	\$ -	\$ 300	\$ 3,964
Subtotal - Task 700	2	1	18	0	2	4		27	\$ 3,968	\$ -	\$ 324	\$ 4,292
Task 800 - Operation and Maintenance												
801 Meeting No. 7 - Operation and Maintenance Chapter Review	3		4				1	8	\$ 1,231	\$ 15	\$ 96	\$ 1,342
802 Data Acquisition	1		2					3	\$ 480	\$ -	\$ 36	\$ 516
803 Summarize RUL	2		6		4			12	\$ 1,812	\$ -	\$ 144	\$ 1,956
804 Revise Chapter 7 - Operation and Maintenance	2	1	16	2	4			25	\$ 3,664	\$ -	\$ 300	\$ 3,964
Subtotal - Task 800	8	1	28	0	6	5		48	\$ 7,187	\$ 15	\$ 576	\$ 7,778

EXHIBIT C, Cost Estimate
Water System Plan Update

DRAFT

TASK / DESCRIPTION	PM		QM		PE		Staff Prof		GIS		WP		Total Hours	Carollo Labor Cost	OTHER DIRECT COSTS		TOTAL COST	
	DLR	LRK	LRK	AT	AT	NLR	Varies	Varies	Varies	Varies	Travel and Printing	PECE			Total ODC			
Total Labor Rate \$ 176 \$ 226 \$ 152 \$ 132 \$ 137 \$ 95																		
Task 900 - Capital Improvement Plan																		
901 CIP Projects with Triggers	6	1	4	16	4								31	\$ 4,550	\$ -	\$ 372	\$ 372	\$ 4,922
902 Cost Estimates	6	1	4	16	4								31	\$ 4,550	\$ -	\$ 372	\$ 372	\$ 4,922
903 Prioritization	6	1	8	8	4								19	\$ 2,886	\$ -	\$ 228	\$ 228	\$ 3,114
904 Electronic CIP	2		8	8	4								14	\$ 1,956	\$ -	\$ 168	\$ 168	\$ 2,124
905 Meeting No. 8 - Capital Improvement Plan Create Draft Chapter 9 - Capital Improvement Plan	3	3	4	4									11	\$ 1,829	\$ 15	\$ 132	\$ 147	\$ 1,976
906	8	2	24	76	20								42	\$ 5,956	\$ -	\$ 504	\$ 504	\$ 6,460
Subtotal - Task 900	31	8	8	76	20								148	\$ 21,727	\$ 15	\$ 1,776	\$ 1,791	\$ 23,518

EXHIBIT C, Cost Estimate
Water System Plan Update

TASK / DESCRIPTION	PM		QM		PE		Staff Prof		GIS		WP		Total Hours	Carollo Labor Cost	OTHER DIRECT COSTS			TOTAL COST
	DLR	LRK	LRK	AT	AT	NLR	NLR	Varies	Varies	Varies	Varies	Varies			Travel and Printing	PECE	Total ODC	
Total Labor Rate \$ 176 \$ 226 \$ 152 \$ 132 \$ 137 \$ 95																		
Task 1000 - Financial Plan																		
10001 Meeting No. 9 - Financial Plan	3	3											6	\$ 1,206	\$ 15	\$ 72	\$ 87	\$ 1,293
10002 Review and Format Draft Chapter 10 - Financial Plan	8	1										6	15	\$ 2,204	\$ -	\$ 180	\$ 180	\$ 2,384
Subtotal - Task 1000	11	4	0	0	0	0	0	0	0	0	6	21	\$ 3,410	\$ 15	\$ 252	\$ 267	\$ 3,677	
Task 1100 - Plan Integration																		
1101 Executive Summary	6					6							12	\$ 1,848	\$ -	\$ 144	\$ 144	\$ 1,992
1102 City Draft Plan	12		2	24	4	16							58	\$ 7,652	\$ -	\$ 696	\$ 696	\$ 8,348
1103 Meeting No. 10 - City Draft Plan	3			4		1							8	\$ 1,151	\$ 15	\$ 96	\$ 111	\$ 1,262
1104 Agency Draft Plan	12	6	4	24	8	12							66	\$ 9,480	\$ 1,500	\$ 792	\$ 2,292	\$ 11,772
1105 Meeting No. 11 - Commission / Public Review	8	2				16						1	27	\$ 4,067	\$ 15	\$ 324	\$ 339	\$ 4,406
1106 Final Plan	8		4	12	4	12						40	\$ 5,288	\$ 1,000	\$ 480	\$ 1,480	\$ 6,768	
Subtotal - Task 1100	49	8	10	66	16	42						211	\$ 29,486	\$ 2,530	\$ 2,532	\$ 5,062	\$ 34,548	
Total	258	64	108	479	118	110						1137	\$ 186,132	\$ 2,665	\$ 13,644	\$ 16,309	\$ 182,441	

EXHIBIT A
CITY OF TUKWILA
DRAFT SCOPE OF SERVICES
COMPREHENSIVE SANITARY SEWER PLAN

The following is a scope of work for the Comprehensive Sanitary Sewer Plan (Plan) for the City of Tukwila. The Plan will be completed by Carollo Engineers. However, some tasks and task elements will require the participation of City staff from the Planning, Finance, and Public Works Departments. This scope is developed to describe the content and purpose of the Plan, determine tasks to be completed for the update of the previous plan, and identify the resources necessary to accomplish those tasks.

The Plan will be based on the Washington Administrative Code (WAC) 173-240-050 standards. The plan will include a future flow projections, system analysis, and a capital improvements plan (CIP) for existing (2019), 10-year, and build-out scenarios. The 2013 Sewer System Plan Update (Carollo) will be used as the basis for this scope of work.

PROJECT ASSUMPTIONS

1. Carollo Engineers, Inc. and its subconsultants will be referred to as "Consultant" in this document.
2. The City of Tukwila and its staff will be referred to as "City" in this document.
3. All meetings will be held at City offices.
4. Draft Chapters will be provided in electronic copy (PDF and/or Microsoft Word) transmitted via email or secure file transfer.
5. City comments on draft chapters will be documented in the Project Comment Response Log by the Consultant. The Consultant will prepare responses to address the comments in the Comment Response Log for the City's review and acceptance. Resulting changes will be incorporated in the Draft Agency Review Plan, rather than reissuing a draft chapter at the time. However, revised draft chapters can be produced upon City required.
6. The Consultant will prepare an agenda, presentation materials, and document discussions, including action items and decisions, for Consultant-led meetings. Meeting notes and related materials will be transmitted electronically in MS Word and PDF formats via email.
7. The City will print and produce additional copies of all documents as necessary for its use.
8. The City will provide available information related to the project and as requested by the Consultant in a timely manner. The City shall furnish Consultant available studies, reports, and other data pertinent to Consultant's services; obtain, or authorize Consultant to obtain, or provide additional reports and data as required; furnish to Consultant services of others required for the performance of Consultant's services hereunder, and Consultant shall be entitles to use and rely upon all such information and services provided by the City or others in performing Consultant's services under this Agreement.

Comprehensive Sanitary Sewer Plan		
SUMMARY OF CHAPTERS AND APPENDICES		
Chapter / Appendix		Chapter Lead
Executive Summary		Consultant
Chapter 1:	Introduction	Consultant
Chapter 2:	Flow Monitoring	Consultant
Chapter 3:	Flow Projections	Consultant
Chapter 4:	Existing System	Consultant
Chapter 5:	System Analysis	Consultant
Chapter 6:	Operations and Maintenance	Consultant
Chapter 7:	Capital Improvement Plan	Consultant
Appendix A:	State Environmental Policy Act Checklist and Determination of Non-Significance	City
Appendix B:	Agency Review and Comment Letters	City
Appendix C:	Adopting Resolution	City
Appendix D:	King County WTD Conveyance Agreement	City
Appendix E:	System Map with Detailed Pipe	Consultant

TASKS

To meet the objectives of this Scope of Services, the Consultant shall complete the tasks as summarized in the table below and discussed in detail in the text that follows.

Comprehensive Sanitary Sewer Plan	
SUMMARY OF TASKS	
Task Number	Task Name
Task 100	Project Management
Task 200	Introduction
Task 300	Flow Monitoring
Task 400	Flow Projections
Task 500	Existing System
Task 600	System Analysis
Task 700	Operation and Maintenance
Task 800	Capital Improvement Plan
Task 900	Plan Preparation

The scope of services for the above project will consist of the following tasks.

TASK 100 – PROJECT MANAGEMENT

This task includes routine management activities, submittal of monthly progress reports, and overall coordination and assistance. It is anticipated that the Project will be complete by December 2020. Project timeline modifications may require project hour and budget modifications. This task includes the following activities:

TASK 100 ACTIVITIES:

101. Monthly Progress Reports. This subtask includes production and implementation of the project plan, schedule, and budget. Assist the project team members in the implementation of the task items, reviewing the work-in-progress reports. Prepare and submit monthly activity reports showing current project status and identifying key issues or elements of the project that will need to be addressed in the proceeding weeks. An electronic version of the monthly progress reports will be sent to the City for review and approval. This task assumes that no hard copy of the monthly progress reports will be distributed.

102 Project Management Plan. Prepare a Project Management Plan (PMP) that describes deliverables, Plan outline, anticipated meetings, project roles and responsibilities, lists contact information for the project team, describes communications protocols, quality management, and includes the scope of services, schedule, and budget. Quality Management includes, but is not limited to, the following elements:

- Project Manager overview of all primary documents to verify technical consistency and compliance with contract requirements.
- Organization of the work into logical deliverables with qualified staff for each task assigned to the work.
- Resolution of all review comments with a memorandum summarizing key comments and the manner in which each was addressed in the work.

An electronic version of the Project Management Plan will be sent to the City for review and approval. This task assumes that no hard copy of the Project Management Plan will be distributed.

103. Meeting No. 1 – Kick-off Meeting. Facilitate a kick-off meeting to review project management and initial data requests.

104. Client Coordination.

- Manage the consultant project team to track time and budget, work elements accomplished, work items planned for the next period, manpower, scope changes, time and budget needed to complete the project.
- Create and maintain a working project schedule based on the schedule in the PMP.
- Review project status, including scope, budget, and schedule.

Task 100 Assumptions

- The PMP will be updated with full incorporation of review comments after the City review of the draft PMP.
- The total length of the project is 14 months.
- City provides required documents for appendices.

Task 100 City Deliverables

1. Team member contact information.
2. PMP review for completeness.
3. Receive, review, and process Consultant invoices in a timely manner.
4. Respond to data requests in a timely manner.

Task 100 Consultant Deliverables

1. Draft request list.
2. Draft Plan outline.

3. Draft PMP.
4. Final PMP.
5. 14 monthly progress reports and invoices.

Task 100 Meetings

- Meeting No. 1 – Kick off Meeting.

TASK 200 – INTRODUCTION

This task includes basic information that will serve as a foundation for developing a comprehensive program to meet current and projected future sewer system needs. This task will develop *Chapter 1 Introduction*. The task includes the following activities:

TASK 200 ACTIVITIES

201. Meeting No. 2 - 2013 Chapter 1 Review. Facilitate a meeting to review and identify updates needed to Chapter 1 – Introduction. This may include: related comprehensive sewer plans from the neighboring jurisdictions and other related plans; recent history of the City’s sewer, system background; and policy and criteria. A data request will be prepared based on the meeting.

202. Data Acquisition. Prepare a data request for the required information. The request may include, but is not limited to, the following:

- Related comprehensive sewer plans from the neighboring jurisdictions and other related plans.
- Agreements with neighboring jurisdictions.
- Neighboring/adjacent jurisdictions map, in Geographic Information System (GIS) format with current boundaries.
- GIS data for the sewer system including City Limits, current sewer service area, urban growth area (UGA), AutoCAD data for existing facilities, and interties.
- Service and Fiscal Policies related to service area and conditions of service, in MS Word. It is assumed the City will provide language for all requested changes to policies and criteria.
- Emergency Management goals, including redundancy and reliability standards related to system components, in MS Word.
- The standard plans and specification, in MS Word. It is assumed the City will provide its standard plans and specifications for inclusion in the Plan.

203. Revise Chapter 1 - Introduction. Prepare a revised Chapter 1 - Introduction based on City direction. It is anticipated that any revisions will be minor. An electronic version of draft Chapter 1 will be sent to the City for review and Consultant will address City comments in a comment response (ROC) log for the City’s approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan in Task 900.

Task 200 Assumptions

- City can provide elements listed under Task 202.
- This task will involve updating the chapter from the 2013 Plan.
- No hard copy of the chapter will be distributed.

Task 200 City Deliverables

1. Requested Data from Task 202.

2. Comments on draft Chapter 1 – Introduction.

Task 200 Consultant Deliverables

1. Draft Chapter 1 – Introduction.
2. ROC for Chapter 1 – Introduction.
3. Meeting Agendas and Minutes.

Task 200 Meetings

- Meeting No. 2 – 2013 Chapter 1 review.

TASK 300 – FLOW MONITORING

This Task will conduct and evaluate flow monitoring to allow accurate estimates of existing and future system flows, so that the City can adequately plan to accommodate its future sewer needs. This task will include flow monitoring of up to seven (7) locations by a Subconsultant. This task will be documented in *TM No. 1 – Flow Monitoring* that will be included as an Appendix of the Plan. The task includes the following activities:

TASK 300 ACTIVITIES

301. Review and Update Sewer Service Area and Basins. Review existing sewer service area and basins based on changes to parcels, collection system piping, and laterals information. It is anticipated the City will provide updated information electronically. Update Sewer Basins and provide an updated map for City review and confirmation.

302. Identify Primary Collectors and Lift Stations. The City will identify primary collectors and lift stations for potential flow monitoring and inclusion in the hydraulic model (Task 600). It is anticipated the collectors will be "skeletonized" to only include pipes greater than 12-inch and 8-inch pipes needed to represent flow conditions from sewer basins. To assist with future tasks, the City will need to provide invert elevations for the selected primary collectors and information on Lift Stations.

303. Identify Flow Monitoring Locations. Identify recommended locations in install temporary flow monitoring devices in the gravity system at up five (5) locations to measure primary collectors and or Lift Stations south of I-405. An additional two (2) flow monitors on primary collectors or lift stations will be added north of I-405, as directed by the City. Flow monitoring locations will be provided to the City to confirm their suitability for meter installation.

304 - Flow Monitoring ADS will provide temporary flow monitoring services to **Consultant** to collect three (3) months of flow data up to seven (7). After completion of the monitoring, ADS will provide a Rain Dependent Inflow & Infiltration (RDI/I) Analysis and an electronic report. The work will be performed in three phases as set forth below:

a. **Phase I - Mobilization**

1. Site Locations - ADS will work with the Consultant and the City to identify/verify the seven (7) locations for monitor installations. Upon approval by the City, additional locations may be added per the optional costs in the budget.
2. Site Investigation - Once the installation sites are provided to ADS, ADS field crew(s) will perform site investigations. ADS will utilize a standard two (2) person field crew for fieldwork and comply with Federal standards for confined-space entry. The proposed flow monitoring location will be located, inspected, and verified for hydraulic suitability. ADS will also check for debris in the manhole that could impact data quality and coordinate any required cleaning efforts with the City.

ADS field crews will look for evidence and signs of erratic flow patterns. ADS will also investigate adjacent manholes in order to identify the best monitoring locations.

3. Site Reports - Site reports will be generated upon completion of the site investigations. The site reports will include a sketch of the general location, physical characteristics and diameters of the proposed monitoring locations, manhole depths, flow measurements, and other comments pertinent to the location such as any special traffic or safety issues. Final site locations to be approved by the Consultant.
4. Equipment - ADS will utilize wireless ADS® Model Triton+™ flow monitors during the course of this project. A typical monitor installation will include an ultrasonic depth sensor that will be mounted at the invert of the pipe, a redundant pressure depth sensor; and a Doppler velocity sensor also mounted at or near the invert.
5. Monitor Activation - Once installed, the monitor will be activated and set to take readings at 5-minute intervals. ADS Field crews will take manual depth readings with a ruler and velocity readings with a portable, instantaneous velocity meter in order to confirm the monitor is collecting accurate data based on the actual existing hydraulic conditions at each location.

b. **Phase II - Flow Monitoring**

1. Flow Monitoring - Once the monitors are installed and verified to be in working order, ADS will monitor for a period of four (4) calendar months ("monitoring period"). This initial monitoring period can be extended based on mutual consent and written agreement of additional work and price for such additional work. Anticipated flow monitoring locations are listed in Table 1. Upon approval of the City, the flow monitoring may be extended by up to two months per the optional costs in the budget.
2. Data Collection and Equipment Maintenance - ADS will collect data from each monitoring location remotely using telemetry on a daily schedule (for sites with good wireless signal). The ADS project team will review the data weekly to ensure each monitor is running properly meeting the project objectives as well ADS standards. ADS Field Crews will perform site confirmations, site maintenance which may include, cleaning the sensor(s), moving, changing or replacing any failed component at each monitor location.
3. Demobilization - Field crews will continue data collections and confirmations (as necessary) until the end of the monitoring period. Once authorized, crews will immediately begin removing the flow monitors and deliver final data to the data analyst.

c. **Phase III - Data Editing, Analysis and Reporting**

1. Data Analysis - Upon completion of the monitoring period, a trained ADS Data Analyst will begin to finalize the data collected for each monitoring location. The data analyst will directly calculate flow using the continuity equation from recorded depth and average velocity data. Flow quantities as determined by the continuity equation will be plotted.
2. Slicer RDI/I Analysis - For each of the flow monitoring location, the analysis will characterize the average dry weather flow conditions and RDI/I calculations for all significant wet weather events, an assessment of hydraulic performance under such conditions. The results of dry weather and wet weather performance will be plotted on maps of the sewer sheds to make it easier to understand where RDI/I originates. The Slicer.com section of the Report will include the following items:
 - *Dry Weather Analysis* – A characterization of the conditions observed during weekday and weekend periods of the flow monitoring period during dry weather periods, excluding periods of extended system recovery to previous rain events. Summarized as a time-series hydrograph of the average diurnal flow quantities for weekday and weekend dry weather periods.

- *Dry Weather Flow Summary* – A table of the Average Dry Day Flow (ADDF) and an estimation of Base Infiltration (BI). Average dry weather diurnal patterns will be provided for each flow monitoring location during weekday and weekend portions of the monitoring period.
 - *Wet Weather Analysis* – A characterization of the conditions observed during specific wet weather events observed during the flow monitoring period, summarized as a time-series hydrograph comparing observed flow quantities to average diurnal flow quantities for corresponding weekday and weekend dry weather periods.
 - *Wet Weather Summary* – A characterization of the conditions observed during the maximum rain event of the monitoring period. This can be summarized as the maximum 30 minute average peaking factor observed during the flow monitoring period.
 - *Wet Weather Prioritization* – A column chart of the Rain Dependent Inflow/Infiltration (RDI/I) determined for each flow monitoring location for each wet weather event. Column chart provides a prioritized ranking based on net RDI/I (as percent rain ingress if basin acreages are provided) or net RDI/I per linear foot of sewer per inch of rain when linear footage information is provided to ADS.
 - *Hydraulic Performance Evaluation* – A narrative interpretation of hydraulic performance recorded at each flow monitoring location as determined using a scattergraph of flow depth and velocity data. The scattergraph interpretation shall evaluate the ability of each flow monitoring location to accommodate flow quantities observed during dry weather and wet weather conditions observed during the monitoring period.
1. Data Delivery and TM No. 2 – Flow Monitoring Summary - ADS will prepare a Final TM to include electronic data of the flow data in tabular, hydrograph, scattergraph, and a RDI/I report in electronic format.
 2. Meeting No. 22 – Flow Monitoring Summary - Facilitate a workshop with City Staff to review the results and conclusions drawn from the flow monitoring.

305. Rainfall Data Review. Obtain and process hourly rainfall data corresponding to the monitoring period from the NOAA SEATAC Airport weather station.

306. Flow Monitoring Data Review. It is anticipated that data will be available from up to seven (7) monitoring locations for the 2019/2020 winter. The data quality for the events will be evaluated for each meter and reviewed with the City. Flow monitoring data will also be reviewed to identify storm events that lead to wet weather flows in the collection system and are suitable for wet weather model calibration. The rainfall for these specific events will be compared with the rainfall record to assess the individual storm sizes return periods. Ideally data will be available for three to five storms. Wet weather flows, R-Factors and I/I rates will be calculated for each meter or SCADA source for up to three storm events. The flow monitoring data analysis will result in modified wet weather modeling parameters that will be used in the hydraulic model.

307. Meeting No. 3 - Flow Monitoring Review. Facilitate a workshop with City staff to review the findings of the Flow Monitoring.

308. Draft Chapter 2 – Flow Monitoring. Consultant will summarize the results of the flow monitoring and data review in Chapter 2: Flow Monitoring. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 2 will be sent to the City for review and Consultant will address City comments in a comment response (ROC) log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan in Task 900.

Task 300 Assumptions

- This task will require a complete update of the Chapter with all new information.

- No hard copy of the draft chapter will be distributed.

Task 300 City Deliverables

1. Requested Data.
2. Review of Draft TM No.1 – Flow Monitoring.
3. Review of Draft Chapter 2 – Flow Monitoring.

Task 300 Consultant Deliverables

1. Draft and Final TM No.1 – Flow Monitoring.
2. Draft Chapter 2 – Flow Monitoring.
3. ROC for Chapter 2 – Flow Monitoring.
4. Meeting Agendas and Minutes.

Task 300 Meetings

- Meeting No. 3 – Flow Monitoring Review.

TASK 400 – FLOW PROJECTIONS

The objective of this task is to develop the sewer flow projections for the sewer service area for the current (2019), 10-year, and build-out (maximum density) scenarios. Sewer flows will be based on the flow monitoring in Task 300 and the City’s demographic projections. A new hydraulic model will be created and used to estimate future wet weather flows. The model will include the developed area south of I405 and up to two (2) sewer basins north of 405. This will not be an all pipe model of the system. The information developed in this task will become Chapter 3 - Flow Projections. This task includes the following activities:

TASK 400 ACTIVITIES

401. Data Acquisition. Data requests will be provided at the kick-off meeting and as needed throughout the project. The City will provide:

- Current I/I program.
- Summary of I/I projects completed since the 2013 Plan.
- Sewer connections by customer class.
- Sewer conservation flow reduction rate.
- Map with direct connections to King County wastewater system.
- Data on number, horsepower, capacity, design point for all pumps at the City’s Lift Stations.
- Lift Stations run time.
- City Planning Department existing and future populations and employment based on PSRC’s 2040 Vision demographic projections and more current planning for the service area. These growth rates for the 10-year scenario will be consistent with the Comprehensive Water Plan.
- GIS Data: land use, zoning data within the City Limits, sewer service area and UGA. It is assumed that these data will be provided in GIS format.
- GIS Data: existing facilities (pipes, manholes, lift stations, connections with King County, etc.), and interties.

402. Update Service Area, Land Use, and Zoning. Based on City provided data, update mapping and descriptions of existing and future service areas, land use, and zoning for the City Sewer Service Area. The Plan will include both figures and text.

403. Demographic Projections. Allocate the existing and 10-year and build-out projection of sewer population and employment provided by the City Planning Department to Sewer Basins. The 10-year growth rates will be consistent with the Comprehensive Water Plan. The build-out projections are anticipated to be based on Comprehensive Plan land use.

404. Design Storm. A design storm has been developed from a long term historical rainfall record at a number of sites near the City. Rainfall data from the ongoing city monitoring program will be reviewed and evaluated to determine if the design storm previously identified for wet weather flow modeling should be revised. The more recent data will also be used to evaluate any local rainfall variability and trends. This review will be prepared to provide the City with a defensible "Design" storm that emulates local weather patterns

405. Develop Existing Dry Weather Flows by Basin. Utilize existing land use maps to develop or confirm average dry weather flows (ADWF) for the modeled sewer basins. The flows will be confirmed with the flow monitoring data as well as the available flow data from the lift stations. Existing land use and currently served areas will be used to estimate flow factors per acre per land use category. The flow factor will be customized to match the observed existing ADWF and will be used to develop flow projections. For basins without measured flow data, flow factors will be assigned from a measured basin with similar land use characteristics.

406. Develop 10-year and Build-out Dry Weather Flows by Basin. The City's comprehensive plan and any additional information on housing densities, commercial and industrial uses will be used along with the flow factors developed in the above task to determine the ultimate development acreage and the ADWF for build-out conditions for up to sewer collection system.

407. Create Hydraulic Model. Using the most recent information from the City's GIS data, create a sewer system hydraulic model using Innovyze InfoSWMM software. The model will include the developed area south of I405 and up to two (2) sewer basins north of 405. The model will include lift stations and primary collectors, and does not include the laterals, branches, or smaller truck sewers serving individual parcels within the basins. The City's existing GIS ArcView ".shp" files will be used to import the collection system data into the hydraulic model. If not available in the GIS, the City will provide invert elevations at key locations to construct the model. Add lift station controls provided by the City to simulate realistic lift station operation. Estimate likely boundary conditions at connections King County transmission mains, as required.

The up to seven (7) basins associated with flow monitoring will be further divided into mini-basins for sanitary and wet weather loading in the model. These mini-basins will group parcels that contribute to common branches and trunks, and will be connected to the modeled primary collector or lift station at the appropriate location.

408. Meeting No4 - Hydraulic Model Creation.. Facilitate a meeting with City staff to review and confirm the elements of the hydraulic model. City staff may be requested to perform field verification of model elements based on this meeting.

409. Calibrate Existing Dry Weather and Wet Weather Flows. The existing dry and wet weather flows will be calibrated based upon the flow monitoring data, and rainfall data provided by the City as well as additional data available from the City's SCADA system for up to seven (7) locations in the collection system. Existing flow depths and velocities will also be checked and calibrated.

The first step is to calibrate the model to dry weather flow conditions. Flow monitoring data will provide custom hourly diurnal curves that establish the daily flow patterns for each metering basin. Model results will be compared to measured flows to check for agreement between model results and measured flows. Model parameters will be adjusted, as needed, to best match the flow monitoring and SCADA data. It is assumed that the City will provide SCADA data in electronic format.

Once the dry weather calibration is completed, the wet weather calibration is conducted. Rainfall information will aid in developing the required rainfall-derived infiltration/inflow (RDI/I) estimations that enter the collection system during a storm event. Wet weather calibration consists of using three storms that occurred during the flow monitoring period. It is recommended that the use of a single calibration period incorporating a number of independent rainfall events should be considered whenever possible. Model results will be reviewed and adjusted, as needed, to best match the flow monitoring, rainfall and SCADA data.

The flows from unmetered basins will be developed as best possible using a mass balance between the available data, and proportioned as best as possible based on development type, age, pipe material, and extent of collection system components.

The hydraulic model will be calibrated in accordance with international modeling standards. The Urban Drainage Group from the Chartered Institution of Water and Environmental Management (CIWEM) has established generally agreed upon principles for model verification. The dry weather and wet weather calibration will focus on meeting the recommendations on model verification contained in the "Code of Practice for the Hydraulic Modelling of Urban Drainage Systems," published by CIWEM (November 2017).

410. Meeting No. 5 - Model Calibration. Consultant will conduct a workshop (Meeting No. 5) with the City to summarize the model calibration results. Consultant will present the model calibration results for both dry and wet weather scenarios. Summary tables will be presented that quantify the percent difference between the measured data and the modeling results. Consultant will discuss calibration standards and confidence levels at the workshop.

411. Hydraulic Model Creation and Calibration TM No.2. Consultant will summarize the model creation and calibration in a Draft and Final TM. An electronic version of draft TM will be sent to the City for review and address City comments in a Final TM that will be included as an Appendix to the Plan.

412. Develop Existing, 10-year and Build out Wet Weather Flow. The calibrated model will be used to determine the existing, 10-year, and build out flows peak wet weather flows for the sewer service area. Wet weather flows will be based on the selected design storm.

413. Reclaimed Water. As required by Ecology, reclaimed water opportunities will be updated. The City currently uses reclaimed water from King County's South Treatment Plant. The City's current use and potential future customers will be summarized based on information provided by the City. No new analysis is anticipated for this effort.

413. Draft Chapter 3 – Flow Projections. Consultant will summarize the sewer flow projections in Chapter 3: Flow Projections. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 3 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 400 Assumptions

- City can provide elements listed under Task 401.
- This task will require a complete update of the Chapter with all new information.
- No hard copy of the draft chapter will be distributed.

- The model will include the developed area south of I405 and the primary interceptors north of 405. This will not be an all pipe model of the system.

Task 400 City Deliverables

1. Requested Data.
2. Field verification of model elements, as required.
3. Comments on TM No. 2 – Hydraulic Model Creation and Calibration
4. Comments on Chapter 3 – Flow Projections.

Task 400 Consultant Deliverables

1. Draft and Final TM No. 2 – Hydraulic Model Creation and Calibration.
2. Draft Chapter 3 – Flow Projections.
3. ROC for Chapter 3 – Flow Projections.
4. Meeting Agendas and Minutes.

Task 400 Meetings

1. Meeting No. 4 – Hydraulic Model Creation.
2. Meeting No. 5 – Hydraulic Model Calibration.

TASK 500 – EXISTING SYSTEM

The objective of this task is to summarize the existing sewer system facilities and components including lift stations, and interties. This task includes the following activities:

TASK 500 ACTIVITIES

501. Meeting No.6 - 2013 Chapter Review. Facilitate a meeting to review and identify updates needed to Chapter 4 – Existing System. A data request will be prepared based on the meeting.

502. Data Acquisition. A data request will be provided for required information for this task. The request may include, but is not limited to, the following:

- Data on pipeline materials and age by linear foot, as available.
- Existing renew and replacement program.
- Summary of improvements completed since the 2013 Plan.
- SCADA data for sewer system.

503. Update Existing Sewer System. Update the components of the major sewer collectors and pump stations using City provided information. This may include changes to boundaries of sewer service basins, lift stations and force mains, and the total length of pipe based on diameter and material. Summarize improvements to the City’s wastewater collection system that have been completed since the 2013 Plan. Develop new system map.

504. Draft Chapter 4 – Existing System. Consultant will summarize the existing system in Chapter 4. An electronic version of draft Chapter 4 will be sent to the City for review and address City comments in a comment response log for the City’s approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 500 Assumptions

- City can provide elements listed under Task 502.
- This task will involve updating the chapter from the 2013 Plan.
- No hard copy of the chapter will be distributed.

Task 500 City Deliverables

1. Requested Data
2. Comments on Chapter 4 – Existing System.

Task 500 Consultant Deliverables

1. Draft Chapter 4 – Existing System.
2. ROC for Chapter 4 – Existing System.
3. Meeting Agendas and Minutes.
4. System Map – Appendix E

Task 500 Meetings

- Meeting No. 6 – 2013 System Review.

TASK 600 – CONVEYANCE SYSTEM ANALYSIS

The objective of this task is to evaluate the capacity of the conveyance system to convey existing and future flows during the City’s design storm. This task will form the basis for *Chapter 5 - Conveyance System Analysis* of the Plan. The capacity assessment will be conducted for the collection system included in the hydraulic model and at lift stations. This task will develop recommended improvements to the system in support of a CIP for 10-year and build-out scenarios. This task includes the following activities.

TASK 600 ACTIVITIES:

601. Collection System Analysis. After the model has been calibrated, the design storm will be routed through the modeled collection system capacity to evaluate capacity during existing, 10-year and build-out conditions. Evaluate capacity deficient segments and identify bottlenecks or other system limitations. Identify improvements to resolve deficiencies using the hydraulic model. All improvements will be confirmed using the hydraulic model.

602. Lift Station Capacity Analysis. Evaluate the existing lift stations capacity based on flow estimates for the design storm. The current performance of the existing lift stations, as provided by the City, will be compared to the modeled peak flows to confirm capacity during the existing, 10-year, and build-out scenarios. Required upgrades/modifications will be recommended, as necessary, to address lift station capacity deficiencies.

603. Meeting No. 7 - Capacity Analysis. Facilitate a meeting with City Staff to review the results of the collection system and Lift analysis, as well as initial recommended improvements.

604. Lift Station Operational Analysis and Meeting No.8. Conduct a high-level evaluate up to three existing lift stations operational and hydraulic performance to determine if improvements are needed to the Lift Stations. The evaluation will focus on hydraulic capacity, redundancy, facility reliability, and operational considerations, such as wet well sizing. Conduct a site visit of the selected Lift Stations (Meeting No. 8) to document existing infrastructure (Assumed half day site visit). Formulate conceptual Alternatives to address identified issues. Planning level costs, technical considerations and operation and maintenance issues will be compared to develop a recommended alternative. Results of this task will be incorporated into the CIP.

605. Draft Chapter 5 - Conveyance System Analysis. Chapter 5 will document the conveyance system analysis including the recommended improvements to the system. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 5 will be sent to the City for review and address City comments in a comment response log for the City’s approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 600 Assumptions

- City can provide any data requested.

- This task will require a complete update of the Chapter with all new information.
- No hard copy of the chapter will be distributed.

Task 600 City Deliverables

1. Requested Data.
2. Comments on Chapter 5 – Conveyance System Analysis.

Task 600 Consultant Deliverables

1. Draft Chapter 5 – Conveyance System Analysis.
2. ROC for Chapter 5 – Conveyance System Analysis.
3. Meeting Agendas and Minutes.

Task 600 Meetings

3. Meeting No. 7 – Conveyance System Analysis.
4. Meeting No. 8 – Lift Stations Site Visit.

TASK 700 – OPERATION AND MAINTENANCE

The objective of this task is to assure satisfactory management of sewer system operations. It will provide an overview of the sewer system responsibility and authority, system operation and maintenance plan, equipment supplies and inventory, and emergency response. The City may need to update its existing emergency response plan that will be included as an appendix to the Comprehensive Plan. This task includes the following activities:

TASK 700 ACTIVITIES

701. Meeting No. 9 – O&M Chapter Review. Facilitate a meeting to review and identify updates needed to Chapter 6 – O&M. A data request will be prepared based on the meeting.

702. Data Acquisition. Data requests will be provided at the kick-off meeting and as needed throughout the project. The City will provide:

- Copy of the organization chart.
- Copy of the FOG control program.
- Copy of the overflow emergency response plan.
- Current operations and maintenance program activities.

703. Collection System and Lift Station Condition and Maintenance Summary. The City’s reported condition and maintenance problems will be summarized. Review basins identified with high I/I for potential causes of I/I including a history of repairs, and pipe age and material. Discuss I/I causes with City operation staff. Review the existing I/I program. Summarize completed projects. Identify or update I/I reduction goals. Document pipes with known maintenance issues, such as accumulation of solids, FOG build up, or root intrusion. A GIS map will be created, identifying the location of these pipe segments. General pipe replacement timing based on Remaining Useful Life will be based on prior analyses. Document City concerns with condition or maintenance of Lift Stations. No site visits will be completed during this task. Information for this task will be provided by the City electronically or during Meeting No. 7.

704. Update Chapter 6 – Operations and Maintenance. Update Chapter 6 based on information provided by the City. This may include updates to organization chart, certification, and collection system and lift station maintenance, O&M program activities, and known major deficiencies in the City’s operation and maintenance

(O&M) programs. This task does not include a FOG ordinance or program, overflow emergency response plan, a detailed O&M Manual, or maintenance management system. A detailed evaluation of City O&M programs will not be conducted. An electronic version of draft Chapter 6 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan.

Task 700 Assumptions

- City can provide elements listed under Task 702.
- This task will involve updating the chapter from the 2013 Plan.
- No hard copy of the chapter will be distributed.

Task 700 City Deliverables

1. Requested Data from Task 702.
2. Comments on Draft Chapter 6 – Operations and Maintenance.

Task 700 Consultant Deliverables

1. Draft Chapter 6 – Operations and Maintenance.
2. ROC for Chapter 6 – Operations and Maintenance.
3. Meeting Agenda and Minutes

Task 700 Meetings

- Meeting No. 9 – 2013 Chapter Review.

TASK 800 – CAPITAL IMPROVEMENT PLAN

This Task will summarize the recommended improvements for the conveyance system and lift stations in accordance with the City's Policy and Criteria. This task will develop Chapter 7 Capital Improvement Program for the Plan. Total project costs will be developed for each recommended improvement and ranked by priority. This task includes the following activities:

TASK 800 ACTIVITIES

801. CIP Projects. Identify and describe CIP projects from prior tasks and existing City planning. Prepare a description of each project.

802. Cost Estimates. Develop planning level cost estimates for all recommended projects using costs provided in other planning efforts. Cost estimates for construction, engineering, permitting, and other contingencies will be prepared; all costs will be given in 2019 dollars.

803. Prioritization. Prioritize condition-related and capacity-related projects identified in the previous tasks for inclusion in the CIP into 10 year and long term scenarios

804. Meeting No. 10 – CIP Review. Facilitate a meeting with City staff to review and verify CIP projects, costs and prioritization

805. Electronic CIP. Develop an electronic CIP tool using Excel to assist the City with future budgeting. Each project will be listed on a separate tab including project description, justification, estimated cost, and recommended year for implementation. City staff will be provided the ability to adjust indirect costs and escalation factors. A copy of the electronic CIP will be provided to City staff. Hardcopies of the project cut-sheets will be included as an appendix. The Consultant will train City staff on using the CIP Tool.

806. Financial Summary. Summarize Sewer Utility financial information per WAC requirements. City to provide a discussion cost per service in terms of both debt service and operation and maintenance costs, of all existing facilities. Carollo will estimate additional costs for future facilities recommended during the planning period. This summary does not include an analysis of rates, connection charges, or methods to fund the recommended CIP.

807. Meeting No. 11 – Financial Review. Facilitate a meetings with City Staff to review the financial summary and update priority of CIP projects, as required.

808. Draft Chapter 7. Prepare Chapter 7 - Capital Improvements Plan, including a description of cost estimating methods, project analysis, final recommendations, summary table, and system maps with the location of recommended improvements. It is assumed the efforts in this Task will require a complete update of the Chapter with all new information. An electronic version of draft Chapter 7 will be sent to the City for review and address City comments in a comment response log for the City's approval. Comments will be incorporated in to the Chapter as part of the City Review Draft Plan. This task assumes that no hard copy of the chapter will be distributed.

Task 800 Assumptions

- City can provide any data requested.
- This task will require a complete update of the Chapter with all new information.
- No hard copy of the chapter will be distributed.

Task 800 City Deliverables

1. Requested Data.
2. Comments on Chapter 7 – Capital Improvement Plan.

Task 800 Consultant Deliverables

1. Draft Chapter 7 – Capital Improvement Plan.
2. ROC for Chapter 7 – Capital Improvement Plan.

Task 800 Meetings

- Meeting No. 10 – Capital Improvement Plan.
- Meeting No. 11 – Financial Review.

TASK 900 – PLAN PREPARATION

This Task will include the compilation of all previous tasks. Carollo will prepare a final Comprehensive Sewer Plan that is the compilation of the chapters that have been created as a part of the project, with revisions based on feedback provided by the City throughout the project. The Comprehensive Sewer Plan will comply with WAC 173-240-050. This task includes the following activities:

TASK 900 ACTIVITIES

901. Executive Summary. Carollo will prepare an executive summary, summarizing each element of the Comprehensive Plan.

902. Prepare Staff Review Draft. Incorporate comments from draft chapters. Compile Chapters and develop Technical Appendices. Prepare review draft document for City Staff in one (1) notebook binder copies and an electronic copy.

903. Meeting No. 12 – Staff Review Draft. Meet with City to discuss comments on the Staff Review draft Plan. Comments to be incorporated into SEPA/Agency Review Draft.

904. Meeting No. 13 – Council Review. Assist the City in presenting the findings of the Plan to Council. Carollo will prepare a power point summarizing the Plan’s key points and attend the Council session to support City Staff. It is anticipated the Council presentation will be no longer than 30 minutes.

905. Prepare Agency Review Draft. Prepare three (3) hard copies and one electronic version for the City to distribute for agency review. This task assumes the City will lead the Agency Review process. The City will complete the SEPA review process and obtain approval during the Agency Review period. Carollo will assist City in responding to written comments by regulatory agencies, neighboring jurisdictions, and the public, including no more than three letters. No meetings are anticipated for this task. Additionally, no major plan revisions are included in the scope based on Agency Review comments.

906. Meeting No. 14 – Agency Review Comments. Meet with City to discuss comments on the Agency review comments. A response to comment log will be formulated based on the meeting.

907. Prepare Final Comprehensive Sewer Plan. Incorporate final comments based on agency reviews, as requested by the City. Provide City with three (3) signed and stamped Final Comprehensive Sewer Plans and one electronic version for the City’s use. This task assumes only the documents above will be developed for the Plan approval and any other interim draft plan documents are considered out of scope.

Task 900 City Deliverables

1. City Comments.
2. Public and Agency Review Comments.

Task 900 Consultant Deliverables

1. Executive Summary.
2. City Draft Plan – One PDF.
3. Agency Draft Plan – Three hard copies and one PDF.
4. Final Plan – Two hard copies and one PDF.
5. Comment Response Log.

Task 900 Meetings

- Meeting No. 12 – Staff Review Plan Review.
- Meeting No. 13 – Council Review
- Meeting No. 14 – Agency Review Comments.

Comprehensive Sanitary Sewer Plan SUMMARY OF MEETINGS	
Meetings	Title
Meeting No. 1	Kick-off Meeting
Meeting No. 2	2013 Chapter 1 Review
Meeting No. 3	Demographic Analysis Meeting
Meeting No. 4	Flow Projections and I&I Evaluations
Meeting No. 5	Existing System Review
Meeting No. 6	System Analysis
Meeting No. 7	Operations and Maintenance Chapter Review
Meeting No. 8	Capital Improvement Plan
Meeting No. 9	Financial Review
Meeting No. 10	Plan Review

Comprehensive Sanitary Sewer Plan SUMMARY OF DELIVERABLES	
Deliverable	Notes (if applicable)
Project Management Plan	
All Meeting Agendas & Minutes	
Monthly Progress Reports (with invoices)	
Data Request Spreadsheet	
Draft and ROC for Executive Summary	
Draft Chapter and ROC for Chapter 1 – Introduction	Revision of chapter from 2013 Plan
Draft Chapter and ROC for Chapter 2 – Demographic Analysis	Full chapter update
Draft Chapter and ROC for Chapter 3 – Flow Projections	Full chapter update
Hydraulic Model	New
Draft Chapter and ROC for Chapter 4 – Existing System	Revision of chapter from 2013 Plan
Draft Chapter and ROC for Chapter 5 –System Analysis	Full chapter update
Draft Chapter and ROC for Chapter 6 – Operations & Maintenance	Revision of chapter from 2013 Plan
Draft Chapter and ROC for Chapter 7 –Capital Improvement Plan	Full chapter update
City Draft Plan	
Agency Draft Plan	
Final Draft Plan & All Electronic Files	

EXHIBIT C, Cost Estimate
Comprehensive Sewer System Plan

TASK / DESCRIPTION	PM DLR	QM LRK	PE AMT	Staff MM/J\$	GIS Varies	WP Varies	Total Labor Rate \$ 176 \$ 226 \$ 155 \$ 132 \$ 137 \$ 95				Total Hours	Carollo Labor Cost	Sub Total Cost	Sub Markup @ 10%	Total Cost	OTHER DIRECT COSTS		TOTAL COST
							Travel and Printing	PECE	Total ODC									
Task 100 - Project Management																		
101 Monthly Progress Reports and Invoices	28	7	14			14					10,010						10,766	
102 Project Management Plan	2		8			4					1,972						2,140	
103 Meeting No. 1 - Kick-off Meeting	3		3	4		2					1,711						1,905	
104 Client Coordination	28	7				0					6,510						6,930	
Subtotal - Task 100	61	14	25	4	0	20					20,203				50	1,488	21,741	
Task 200 - Introduction																		
201 Meeting No. 2 2013 Chapter 1 Review	3			4		2					1,246						1,404	
202 Data Acquisition	1		8		4						1,780						1,936	
203 Revise Chapter 1 - Introduction	1	1		8		4					1,838						2,006	
Subtotal - Task 200	5	1	0	20	4	6					4,864				50	432	5,346	
Task 300 - Flow Monitoring																		
Review and Update Sewer Service Area and Basins																		
301	1	1	4	4	4	4					2,088						2,266	
302 Identify Primary Collectors and Lift Stations	1		2	8	4	4					2,000						2,270	
303 Identify Flow Monitoring Locations	1		4	2	2	2					1,070						1,154	
304 Flow Monitoring	8	1	4	4	2	2					2,528	4,053		44,587			47,295	
305 Rainfall Data Review	5		1	4							683						743	
306 Flow Monitoring Data Review	2		4	15							2,952						3,204	
307 Meeting No. 3 - Flow Monitoring Review	3		3	6							1,785						1,979	
308 Draft Chapter 2 - Flow Monitoring	2	1	4	16	4	4					4,238						4,610	
Subtotal - Task 300	18	3	26	53	16	4					17,444	40,534		44,587	50	1,440	61,921	
Task 400 - Flow Projections																		
401 Data Acquisition	4			6	4	4					2,044						2,212	
402 Update Service Area, Land Use, and Zoning	2			8	6	6					2,230						2,422	
403 Demographic Projections	4	1	1	16	4	4					3,590						3,890	
404 Design Storm	1	1	4	8							2,078						2,246	
405 Develop Existing Dry Weather Flows by Basin	1	1	8	24	6	6					5,632						6,112	
406 Develop 10-year and Build-out Dry Weather Flows by Basin	1	1	8	24	8	8					5,906						6,410	
407 Create Hydraulic Model	1	2	12	40	16	16					9,980						10,812	
408 Meeting No. 4 - Hydraulic Model Creation	3		3	6	4	2					2,523						2,789	
409 Calibrate Existing Dry Weather and Wet Weather Flows	4	2	16	52	4	4					11,048						11,984	
410 Meeting No. 5 - Model Calibration	3	3	3	4	2	2					1,711						1,905	
411 Hydraulic Model Creation and Calibration	4		8	24	4	4					6,040						6,588	
412 Develop Existing, 10-year, and Build-out Wet Weather Flow	1	1	4	16	2	2					3,408						3,696	
413 Reclaimed Water	6	1	2	12							2,866						3,084	
414 Draft Chapter 3 - Flow Projections	4	2	6	24	6	4					6,456						7,008	
Subtotal - Task 400	39	12	72	264	64	12					65,492			100	5,556		71,148	

EXHIBIT C. Cost Estimate
Comprehensive Sewer System Plan

TASK / DESCRIPTION	PM		OM		PE		Staff		Prof		GIS		WP		Total Hours	Carollo Labor Cost	Sub Total Cost	Sub Markup @ 10%	Total Cost	OTHER DIRECT COSTS		TOTAL COST	
	DLR	LRK	LRK	AMT	AMT	MMJUS	Varies	Varies	Varies	Varies	Varies	Varies	Varies	Varies						Travel and Printing	PECE		\$12.00
Total Labor Rate \$ 176 \$ 226 \$ 155 \$ 132 \$ 137 \$ 95																							
Task 600 - Existing System																							
501 Existing Chapter Review Meeting No. 4	3					4									7	\$ 1,056	\$ -	\$ -	\$ -	\$ 50	\$ 84	\$ 134	\$ 1,190
502 Data Acquisition	1					4									9	\$ 1,252	\$ -	\$ -	\$ -	\$ -	\$ 108	\$ 106	\$ 1,360
503 Update Existing Sewer System	1					8									13	\$ 1,780	\$ -	\$ -	\$ -	\$ -	\$ 156	\$ 156	\$ 1,936
504 Revise Chapter 4 - Existing System	2	1	0	0	8	4	4								19	\$ 2,562	\$ -	\$ -	\$ -	\$ -	\$ 228	\$ 228	\$ 2,790
Subtotal - Task 600	7	1	0	0	24	12	4	4	4	4	4	4	4	4	48	\$ 6,650	\$ -	\$ -	\$ -	\$ 50	\$ 576	\$ 626	\$ 7,276
Task 600 - Conveyance System Analysis																							
601 Collection System Analysis	2	2	8	40	8										60	\$ 8,420	\$ -	\$ -	\$ -	\$ -	\$ 720	\$ 720	\$ 9,140
602 Lift Station Capacity Analysis	2	2	24	24	8										60	\$ 8,788	\$ -	\$ -	\$ -	\$ -	\$ 720	\$ 720	\$ 9,508
603 Meeting No. 7 - Capacity Analysis	3			3	4										10	\$ 1,521	\$ -	\$ -	\$ -	\$ 50	\$ 120	\$ 170	\$ 1,691
Draft Chapter 5 - Conveyance System Analysis	2	2	8	24	4	4									44	\$ 6,140	\$ -	\$ -	\$ -	\$ -	\$ 528	\$ 528	\$ 6,668
Subtotal - Task 600	9	6	43	92	20	4	4	4	4	4	4	4	4	4	174	\$ 24,669	\$ -	\$ -	\$ -	\$ 50	\$ 2,088	\$ 2,138	\$ 27,007
Task 700 - Operation and Maintenance																							
701 Meeting No. 8 - O&M Chapter Review	3					4									9	\$ 1,246	\$ -	\$ -	\$ -	\$ 50	\$ 108	\$ 158	\$ 1,404
702 Data Acquisition	1					2									3	\$ 440	\$ -	\$ -	\$ -	\$ -	\$ 36	\$ 36	\$ 476
Collection System and Lift Station Condition and Maintenance Summary	4					16									24	\$ 3,364	\$ -	\$ -	\$ -	\$ -	\$ 288	\$ 288	\$ 3,652
Draft Chapter 6 - Operations and Maintenance	2	1	16	4	4	4									27	\$ 3,618	\$ -	\$ -	\$ -	\$ -	\$ 324	\$ 324	\$ 3,942
Subtotal - Task 700	10	1	0	38	8	6	6	6	6	6	6	6	6	6	63	\$ 8,668	\$ -	\$ -	\$ -	\$ 50	\$ 756	\$ 806	\$ 9,474
Task 800 - Capital Improvement Plan																							
801 CIP Projects with Triggers	2	1	4	16	4										27	\$ 3,858	\$ -	\$ -	\$ -	\$ -	\$ 324	\$ 324	\$ 4,182
802 Cost Estimates	2	4	8	16	4										34	\$ 5,156	\$ -	\$ -	\$ -	\$ 408	\$ 408	\$ 5,564	
803 Prioritization	2	1	4	8	4										19	\$ 2,802	\$ -	\$ -	\$ -	\$ 228	\$ 228	\$ 3,030	
804 Meeting No. 9 - CIP	3			4	2										9	\$ 1,246	\$ -	\$ -	\$ -	\$ 50	\$ 108	\$ 158	\$ 1,404
805 Electronic CIP	2			24	8										34	\$ 4,616	\$ -	\$ -	\$ -	\$ -	\$ 408	\$ 408	\$ 5,024
806 Financial Summary	4	1		24	24										29	\$ 4,098	\$ -	\$ -	\$ -	\$ -	\$ 348	\$ 348	\$ 4,446
807 Meetings No. 10 - Financial Review	3			4	4										7	\$ 1,056	\$ -	\$ -	\$ -	\$ 50	\$ 84	\$ 134	\$ 1,190
Draft and Final Chapter 7 - Capital Improvement Plan	4	2	2	24	4	4									40	\$ 5,592	\$ -	\$ -	\$ -	\$ 100	\$ 480	\$ 480	\$ 6,042
Subtotal - Task 800	22	9	18	120	24	6	6	6	6	6	6	6	6	6	199	\$ 28,394	\$ -	\$ -	\$ -	\$ 100	\$ 2,388	\$ 2,488	\$ 30,882
Task 900 - Plan Preparation																							
901 Executive Summary	6					6									12	\$ 1,848	\$ -	\$ -	\$ -	\$ -	\$ 144	\$ 144	\$ 1,992
902 Prepare Staff Review Draft	8	4	4	24	4	24									68	\$ 8,928	\$ -	\$ -	\$ 35	\$ 816	\$ 851	\$ 9,779	
903 Meeting No. 11 - Staff Review Draft	3			4	2										9	\$ 1,246	\$ -	\$ -	\$ -	\$ 50	\$ 108	\$ 158	\$ 1,404
904 Meeting No. 12 - Council Review	8	2	16	16	1										27	\$ 4,097	\$ -	\$ -	\$ 50	\$ 324	\$ 374	\$ 4,441	
905 Prepare Agency Review Draft	12	6	4	24	8	24									78	\$ 10,632	\$ -	\$ -	\$ 1,000	\$ 936	\$ 1,936	\$ 12,568	
Meeting No. 13 - Agency Review Comments	3			4	4										9	\$ 1,246	\$ -	\$ -	\$ -	\$ 50	\$ 108	\$ 158	\$ 1,404
907 Prepare Final Comprehensive Sewer Plan	8	8	4	12	4	24									60	\$ 8,248	\$ -	\$ -	\$ 1,000	\$ 720	\$ 1,720	\$ 9,968	
Subtotal - Task 900	48	20	12	90	16	77	263	263	263	263	263	263	263	263	263	\$ 36,215	\$ -	\$ -	\$ 2,185	\$ 3,156	\$ 5,341	\$ 41,556	
Total	219	67	196	705	164	139	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	1,430	\$ 40,534	\$ 4,053	\$ 44,587	\$ 2,685	\$ 17,880	\$ 20,565	\$ 277,951	