

**EXHIBIT A**  
**CITY OF CAMAS**  
**SCOPE OF SERVICES**

**GENERAL SEWER PLAN UPDATE**

The following Scope of Services has been developed to assist the City of Camas (City) with the update of its General Sewer Plan (GSP). The following tasks under this Scope of Services have been prepared based on Carollo Engineers, Inc.'s (Consultant) and its subconsultant's current understanding of the proposed project, and through discussions with City staff.

**PROJECT BACKGROUND**

The City initiated this GSP to coincide with the update of the City's Our Camas 2045 Comprehensive Plan. The City recognizes the importance of planning, developing, and maintaining wastewater system facilities that provide reliable and efficient service for existing customers and to serve anticipated growth defined by the Comprehensive Plan. The GSP is designed to meet state, county, and local requirements. The project represents an update of the City's existing GSP (Carollo, 2024) to align with recent Comprehensive Plan updates, which extend the land use planning period through 2045. This project will consider system needs in the context of providing sewer service to meet updated population and economic development projections presented in the updated Comprehensive Plan.

Effort will involve evaluating sewer collection system needs in portions of the City's service area not considered in the existing GSP. Updated flow and load projections will be developed based on new information presented in the Comprehensive Plan update. An updated evaluation of the capacity of wastewater treatment plant (WWTP) capacity utilizing those updated flows and loads, as well as an update/confirmation of condition driven needs to those facilities are included.

**PROJECT ASSUMPTIONS**

- Carollo Engineers, Inc. will be referred to as "Consultant" in this document.
- City of Camas and its staff will be referred to as "City" in this document.
- State of Washington Department of Ecology and its staff will be referred to as "Ecology" in this document.
- All meetings will be held on Microsoft Teams, unless otherwise specified.
- All deliverables will be provided in electronic copy (PDF and/or Microsoft Word) transmitted via email or secure file transfer. The City will print and produce all documents as necessary for its use. Consultant will not provide any deliverables in a paper format.
- 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 request.
- Electronic Flow Projection Tool will be provided in .xlsx format.

- The Consultant will prepare an agenda, presentation materials, and document discussions, including action items and decisions, and meeting minutes for Consultant-led meetings. Meeting notes and related materials will be transmitted electronically in MS Word and/or PDF formats via email.
- In providing opinions of cost, financial analyses, economic feasibility projections, schedules, and quantity and/or quality estimates for potential projects, the Consultant has no control over cost or price of labor and material; unknown or latent conditions of existing equipment or structures that may affect operation and maintenance costs; competitive bidding procedures and market conditions; time or quality of performance of third parties; quality, type, management, or direction of operating personnel. Therefore, the Consultant makes no warranty that the City's actual project costs, financial aspects, economic feasibility, schedules, and/or quantities or quality realized will not vary from the Consultant's opinions, analyses, projections, or estimates.
- The Consultant shall not be responsible for acts and decisions of third parties, including governmental agencies, other than the Consultant's subconsultants, that impact project completion and/or success other than noted elsewhere in this scope of work.
- The City will furnish the Consultant with available studies, reports, and other data pertinent to the Consultant's services; obtain or authorize the Consultant to obtain or provide additional reports and data as required; furnish to the Consultant services of others required for the performance of the Consultant's services hereunder; and the Consultant shall be entitled to use and reasonably rely upon all such information and services provided by the City or others in performing the Consultant's services hereunder.
- The GSP update will follow this organization of chapters and meetings as listed in Table 1.

Table 1 [Summary of Chapters and Appendices](#)

Chapter/Appendix		Lead
Executive Summary		Consultant
Chapter 1	Introduction	Consultant
Chapter 2	Regulations, Policies, and Criteria	Consultant
Chapter 3	Basis of Planning	Consultant
Chapter 4	Existing System	Consultant
Chapter 5	I/I Program	Consultant
Chapter 6	Collection System	Consultant
Chapter 7	Wastewater Treatment Facility	Consultant
Chapter 8	Operations and Maintenance	Consultant
Chapter 9	Capital Improvement Plan	Consultant
Chapter 10	Financial Plan	Consultant with FCS
Appendix A	Approvals	
Appendix B	Agency Comment Letters and Responses	
Appendix C	Demographic Projections	
Appendix D	Flow Monitoring Report	
Appendix E	Hydraulic Model Update and Calibration TM	
Appendix F	I/I Program Reports	

Chapter/Appendix		Lead
Appendix G	Local Limits Program Reports	
Appendix H	Wastewater Treatment Plant Permits	
Appendix I	Wastewater Treatment Engineering Report	
Appendix J	Spill Response Plan	
Appendix K	CIP Project Sheet	
Appendix L	Financial Backup	
Appendix M	O&M APE Examples	

Notes:

CIP - capital improvement program; I/I - infiltration and inflow; O&M - operations and maintenance; TM - technical memorandum

Table 2 Summary of Meetings

Meetings	Title	Type
Meeting No. 1	Kickoff Meeting	Virtual
Meeting No. 2	Policies and Criteria, and Regulatory Considerations and Strategy	Virtual
Meeting No. 3	Flow Monitoring Results & Flow Projections	Virtual
Meeting No. 4	WWTP Flows and Loadings	Virtual
Meeting No. 5	Hydraulic Model Development & Capacity Evaluation	Virtual
Meeting No. 6	Capacity Improvements	Hybrid
Meeting No. 7	Influent and select process characterization sampling and analysis effort	Virtual
Meeting No. 8	Review and confirm capacity analysis findings	Virtual
Meeting No. 9	Alternative development workshop with City and plant operations staff to develop and select liquids and solids process area improvements for evaluation	Hybrid
Meeting No. 10	Alternative evaluation workshop to review technical performance, costs, and non-cost considerations associated for each alternative	Hybrid
Meeting No. 11	CIP Review	Hybrid
Meeting No. 12a, 12b, 12c, 12d	Financial Review	Virtual
Meeting No. 13	City Review Draft	Virtual
Meeting No. 14	Agency Review Meeting	Virtual
	Up to 2 council meetings	Virtual
Project Management	36 Coordination Calls	Virtual

## TASKS

To meet the objectives of this Scope of Services, the Consultant shall complete the tasks as summarized in Table 3 and discussed in detail in the text that follows.

Table 3 Task Summary

Task Number	Task Name
Task 100	Project Management
Task 200	Introduction
Task 300	Regulations, Policies, and Criteria
Task 400	Basis of Planning
Task 500	Existing System
Task 600	I/I Program
Task 700	Collection System
Task 800	Wastewater Treatment Facility
Task 900	Operation and Maintenance
Task 1000	Capital Improvement Plan
Task 1100	Financial Plan
Task 1200	Plan Development

### TASK 100 - PROJECT MANAGEMENT

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

#### **TASK 100 ACTIVITIES**

##### **Subtask 101 - Monthly Progress Reports and Invoices**

This subtask consists of 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.

##### **Subtask 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 summarizing key comments and the manner in which each was addressed in the work.

#### **Subtask 103 - Meeting No. 1- Kickoff Meeting**

- Facilitate a meeting to kick off the GSP update, review project management plan and initial data requests.

#### **Subtask 104 - Project Management & 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.
- Bi-Monthly Virtual Status Meeting. Facilitate virtual PM meetings two times per month to review status of project.

#### Task 100 Assumptions

1. The PMP will be updated with full incorporation of review comments after the City review of the draft PMP.
2. The total length of the project is 18 months.
3. City provides required documents for appendices.
4. Thirty-six bi-monthly status meetings will be held over Microsoft Teams. Meetings to be held in conjunction with the Water System Plan Update.

#### Task 100 City Input

1. Team member contact information.
2. Receive, review, and process Consultant invoices in a timely manner.

#### Task 100 Consultant Deliverables

1. Draft GSP outline.
2. Eighteen monthly progress reports and invoices.

#### Task 100 Meetings

1. Meeting No. 1 - Kickoff Meeting.
2. PM Virtual Meetings.

## **TASK 200 - INTRODUCTION**

The purpose of this task is to provide an introduction to the GSP documenting the purpose, review and approvals, and direction to pertinent information. The task effort will be documented in Chapter 1 - Introduction.

### **TASK 200 ACTIVITIES**

#### **Subtask 201 - Regulatory Information Reference**

Prepare a table that provides reference in the GSP to each regulatory required information in the GSP. The intent of this reference is to aid the agency reviewers in conducting an efficient and thorough review of the GSP.

#### **Subtask 202 - Draft and Final Chapter 1 - Introduction**

Prepare draft Chapter 1 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 200 Assumptions**

1. None.

#### **Task 200 City Input**

1. Comments on draft Chapter 1 - Introduction.

#### **Task 200 Consultant Deliverables**

1. Draft Chapter 1 - Introduction.
2. Record of Comment (ROC) for Chapter 1 - Introduction.

#### **Task 200 Meetings**

1. None.

## **TASK 300 - REGULATIONS, POLICIES, AND CRITERIA**

The purpose of this task is to update the applicable regulations, policies impacting long-term sewer planning, and define planning criteria from the 2024 GSP. The task effort will be documented in Chapter 2 - Regulations, Policies and Criteria.

### **TASK 300 ACTIVITIES**

#### **Subtask 301 - Applicable Regulations, Considerations and Strategy.**

Review and update regulatory requirements presented in Chapter 2 of the 2024 GSP. Include a summary of requirements from the City's Wastewater Treatment Plant National Pollutant Discharge Elimination System (NPDES) Permit WA002049. This will include summarizing requirements of the City's updated NPDES Permit (under development for renewal by Ecology at time of drafting this scope of work) if renewed prior to GSP Update commencing.

In the course of Ecology review and approval of the existing GSP, the need for a Tier II evaluation in accordance with Washington Administrative Code (WAC) 173-201A-320 and Publication No. 11-10-073 was identified. It is expected this Tier II evaluation will be submitted by the City during the next cycle of NPDES permit renewal or at the point in time the City determines additional discharge capacity must be permitted.

Prepare an effluent and receiving water desktop analysis to assess the potential for exceedances of water quality objectives under projected future conditions. This analysis will rely on influent, effluent, and receiving water data requested in Task 400 and be conducted in conjunction with WWTP process evaluations described in Task 800. The results/findings of the desktop analysis will be summarized in Chapter 2. A summary addressing the implications of these findings in the context of potential future implications on WWTP unit processes and facilities will be included in Chapter 7.

### **Subtask 302 - Policies and Criteria**

Obtain existing level of service policies, financial policies, planning criteria, and design standards from the City. Review policies and criteria and make recommendations for additional or revised criteria and service area goals that best fit the needs of the City. Confirm the design storm used for the capacity evaluation. Review current and potential future design standards for the sewer system, including design depth to pipe diameter (d/D) standards. Criteria will include allowable pipeline d/D values during peak flows, minimum velocities, minimum/maximum slope, and pumping requirements.

### **Subtask 303 - Meeting No.2 - Policies and Criteria & Regulatory Considerations and Strategy**

Facilitate a meeting to review City policies and criteria. This will include discussion of possible future implications for WWTP processes and facilities and outline alternatives which will be considered in Task 800

### **Subtask 304 - Draft and Final Chapter 2 - Policies and Criteria**

Prepare draft Chapter 2 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 GSP.

#### Task 300 Assumptions

1. City will provide pertinent information for missing or updated facility data.
2. Desktop analysis of reasonable potential will be conducted utilizing publicly available (Ecology) tools.

#### Task 300 City Input

1. Comments on draft Chapter 2 - Policies and Criteria.

#### Task 300 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 2 - Policies and Criteria.
3. ROC for Chapter 2 - Policies and Criteria.

#### Task 300 Meetings

1. Meeting No. 2 - Policies and Criteria and Regulatory Considerations and Strategy.

## **TASK 400 - BASIS OF PLANNING**

The purpose of this task is to update the planning criteria and all planning assumptions for use in evaluation of the wastewater collection system, from the 2024 GSP. The planning area assumed for this GSP includes the current utility services boundary and the North Shore expansion area. The task efforts will be documented in Chapter 3 - Basis of Planning.

### **TASK 400 ACTIVITIES**

#### **Subtask 401 - Data Request**

Prepare a data request for the required information. The request is expected to consist of the following:

- ADS flow monitoring data and historical pump run time data at Pump Stations.
- Updates to population and employment projections since the last GSP.
- Lift station flow data (if available).
- Major industrial discharges.
- WWTP influent and effluent flow monitoring data for the preceding 5 years. (See also Task 800, which includes an influent wastewater characterization sampling effort and focused process sampling internal to the plant to provide additional data).
- Most recent WWTP receiving water data (assumed to be data used to inform the required reasonable potential analysis for the City's recent NPDES permit renewal application).
- Results and report summarizing the findings of the City's most recent WWTP outfall evaluation as required by the existing NPDES permit.
- Available data characterizing industrial wastewater discharged to the WWTP (see also Subtask 404).
- Pertinent WWTP record drawings and basis of design reports.
- Spreadsheets utilized for the most recent NPDES permit renewal to assess reasonable potential.
- Additional information includes level of service policies, planning criteria, design standards, and financial data from the City.

A summary will be prepared identifying any informational gaps. Consultant will coordinate with City's project manager to resolve.

#### **Subtask 402 - Service Area Boundaries**

Update the City's service area boundaries to be considered in the GSP for the existing system service area ("Existing"), the 20-year timeframe ("20-Year"), and the ultimate ("Build-out") planning periods. City to review and confirm the service area boundaries.

#### **Subtask 403 - Demographic Analysis**

Update the service area and land use maps from the 2024 GSP, using geographic information system (GIS) data. Review current population, land use, and zoning to establish the historical demographics and to develop future demographics for the service area. Establish land use data per basin for the existing system service area ("Existing"), the 20-year timeframe ("20-Year"), and the ultimate ("Build-out") planning periods. Demographics within the 20-Year timeframe will be based on the Water System Plan Update.



#### **Subtask 404 - Industrial Flows and Loads**

The City's largest connections, potential large scale industrial flows and loads and future wholesale water customers will be evaluated and projected separately and added to other projected system flows and loads. The industrial flow and load projections will be updated from the 2024 GSP and be consistent with the WSP industrial demand projections.

#### **Subtask 405 - Review Flow Monitoring Report**

The City will contract directly with ADS to conduct flow monitoring for the STEP system and the North Shore of the gravity collection system. Flow monitoring basins and statistics will be provided in an email to ADS. ADS will provide raw data and a full report on flow and I/I analysis for each metered basin. This data will be verified by the Consultant and used for flow development and model calibration. The flow monitoring program will take place in the winter of 2024/2025 and is anticipated to capture dry and wet weather flows, including storm events required to meet calibration standards. Four or fewer flow meters will be used. Flow monitoring will be performed at one location on the STEP system, one location in the North Shore, and the two gravity pipes upstream of the treatment plant.

#### **Subtask 406 - Flow Projections**

Flow projections are based on demographic assumptions and the data obtained from flow monitoring. The flow projections from the 2024 GSP will be updated as a part of this subtask, as follows:

- **Flow Data Review.** Compare base sanitary flows estimated from existing land use to dry weather flow calculated through the flow monitoring for each basin. Existing land use and currently served areas will be used to estimate flow factors in gallons per acre per land use category. The flow factors will be customized to match the observed existing average dry weather flow (ADWF) and will be used to develop flow projections. Pump Station runtime data and City pump-down curves will be used to proportion ADWF throughout basins, where available.
- **Base Flow Projections.** Develop base sanitary flows for three planning periods: existing conditions, 20-year, and build-out scenarios.
- **Infiltration and Inflow Projections.** Estimate I/I flow rates for each sewer basin based on current and future land use and area specific I/I factors. Developed I/I flow rates will be compared to I/I flow rate estimates per monitored basin. Develop I/I flow rates for new areas to be added to the system.
- **Flow Projections.** Future flows, including base flows, I/I, and industrial point flows, will be projected based on service area growth. Future flows will be assessed for each sewer and pump station basin for the selected planning periods.

#### **Subtask 407 - WWTP Wastewater Flows and Loadings**

Consultant shall review historic ammonia, pH, fecal coliform, biochemical oxygen demand (BOD) and total suspended solids (TSS) wastewater load contributing to the wastewater treatment plant. Unit loading factors will be developed using existing flow and population data provided by the City to provide a basis for projected future loading within the service area. The unit loading factors will be established on an equivalent residential units (ERU) basis for both residential and employment units. It is anticipated different loading factors will be developed for STEP and gravity customers. Based on population projections provided by the City, project flows and loads for the planning period that will require treatment at the facility. Load projections will be summarized by basin and at the facility. Resulting flow and load projections will be used in Task 800 to evaluate WWTP capacity implications.

### **Subtask 408 - Meeting No. 3 - Flow Monitoring Results and Flow Projections**

Facilitate a meeting to review the flow monitoring results and flow projections with the City. Confirm flow projections are consistent with City understanding of the current and future system. Flows will be summarized by basin and at the facility.

### **Subtask 409 - Meeting No. 4 - WWTP Flows and Loadings**

Facilitate a meeting to review the WWTP flow and loading analysis findings with the City. Confirm flows and loadings are consistent with City understanding for the current facility and discuss implications of projections for future conditions.

### **Subtask 410 - Draft and Final Chapter 3 - Basis of Planning**

Prepare draft Chapter 3 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 GSP.

#### Task 400 Assumptions

1. Flow monitoring will be performed at two locations on STEP system, one location in the North Shore, and the two gravity pipes upstream of the treatment plant.
2. Previously identified loading factors previously identified for large industries will be used and not reexamined.

#### Task 400 City Input

1. Requested Data from Task 401.
2. Comments on draft Chapter 3 - Basis of Planning.

#### Task 400 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 3 - Basis of Planning.
3. ROC for Chapter 3 - Basis of Planning.

#### Task 400 Meetings

1. Meeting No. 3 - Flow Monitoring Results and Flow Projections.
2. Meeting No. 4 - WWTP Flows and Loadings.

## **TASK 500 - EXISTING SYSTEM**

The purpose of this task is to update the Existing System Chapter from the 2024 GSP.

### **TASK 500 ACTIVITIES**

#### **Subtask 501 - Data Request**

Prepare a data request for the required information. The request is expected to consist of the following if updated since last GSP:

- As-builts of STEP system.
- As-builts of North Shore Area.

### **Subtask 502 - Study Area**

Update and incorporate study area information in Chapter 4 - Existing System.

### **Subtask 503 - Existing System**

Review the components of major sewer collectors and pump stations using data from the City's GIS, available pipe database, discussions with staff, and previous studies. Incorporate information from the City's 2024 GSP. Subtasks include the following:

- Update chapter text, tables, and figures summarizing the City's collection and conveyance system. Summarize the boundaries of sewer service basins and pump station basins (if different). Provide descriptions for each of the City's sewage pump stations, and force mains. Provide total length of pipe based on diameter and material, if available.
- Summarize improvements to the City's wastewater collection system that have been completed since the 2024 GSP, based on discussions with City Staff.
- Develop figures for the GSP of the existing system infrastructure using the City's GIS data.

### **Subtask 504 - Draft and Final Chapter 4 - Existing System**

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 GSP.

#### Task 500 Assumptions

1. None.

#### Task 500 City Input

1. Requested Data from Task 501.
2. Comments on draft Chapter 4 - Existing System.

#### Task 500 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 4 - Existing System.
3. ROC for Chapter 4 - Existing System.

#### Task 500 Meetings

1. None.

## **TASK 600 - I/I PROGRAM**

The purpose of this task is to update the City's I/I Program. Future I/I rates with and without the I/I Program will be estimated for use in the Collection System evaluation.

### **Subtask 601 - Summarize Existing I/I Program**

Summarize the existing I/I Program from City provided annual reports. Tabulate City I/I projects by year and I/I reduction. Create a map of historical I/I projects, if data is available. Identify future activities to be conducted by the I/I Program. Draft Chapter 5 - I/I Program.

### **Subtask 602 - Draft and Final Chapter 5 - I/I Program**

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 GSP.

#### Task 600 Assumptions

1. None.

#### Task 600 City Input

1. Requested Data from Task 601.
2. Comments on draft Chapter 5 - I/I Program.

#### Task 600 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 5 - I/I Program.
3. ROC for Chapter 5 - I/I Program.

#### Task 600 Meetings

1. None.

## **TASK 700 - COLLECTION SYSTEM**

The purpose of this task is to update the existing and future capacity evaluation, update system deficiencies, and revise recommendations to resolve deficiencies. Recommended projects will be included in the CIP.

### **Subtask 701 - Hydraulic Model Update and Calibration**

The City's gravity collection system model will be combined with the STEP system model and converted from DHI's Mike Urban to DHI's 2024 MIKE+. Piping and pumping will be reviewed and updated on the model with a focus on expanding the extents to the North Shore and the STEP system. Model extents will include:

- STEP System: Major STEP force mains and pump stations. The flows will be added to the model geographically by mini-basin for the existing, projected 20-year and build-out conditions.
- Gravity System: The model will include all pipes greater than 6 inches. The flows will be added to the model geographically by mini-basin for the existing projected 20-year and build-out conditions.
- North Shore: Constructed and planned North Shore Sewer infrastructure based on prior City effort.
- The flows will be added to the model geographically by mini-basin for the existing, projected 20-year and build-out conditions.

Model calibration will entail the following:

- Calibration will focus on a quantitative approach based on the recommendations for hydraulic model verification contained in the "Code of Practice for the Hydraulic Modeling of Sewer Systems," version 3.001, published by the Wastewater Planning Group, a section of the Chartered Institution of

Water and Environmental Management and the Consultant's expertise. These recommended calibration criteria include, but are not limited to, the following:

- » The comparison period between observed and modeled events should last until flow has substantially returned to winter dry weather flow.
  - » Observed and modeled hydrographs should meet the criteria for at least two out of three events.
  - » The peak flow should be in the range +25 percent to -10 percent.
  - » The volume of flow should be in the range of +20 percent to -10 percent.
- The existing dry and wet weather flows as described in a previous task will be calibrated based upon the flow monitoring data, and rainfall data provided by the flow monitoring program as well as additional data available from the City's supervisory control and data acquisition (SCADA) system for up to 3 meter locations in the collection system. Existing flow depths and velocities will also be checked and calibrated.
  - 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 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.
  - Calibrate the model for wet weather conditions. Rainfall information will aid in developing the required rainfall-derived infiltration/inflow (RDI/I) estimations that enter the collection system during a storm event. 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 any unmetered basins will be assumed to be unchanged since the previous model calibration.

### **Subtask 702 - Capacity Evaluation**

Perform a hydraulic capacity analysis under the design storm for each basin using the calibrated model, and projected peak flow rates and system expansion developed in Task 200. The analysis will be performed for existing, 20 year, and build-out scenarios only, and will assist in identifying any system deficiencies and improvements required to resolve deficiencies. Subtasks include the following:

- Review related reports and studies for related capacity analyses and recommendations.
- Estimate the available capacity of each basin given existing infrastructure while meeting all performance criteria.
- Develop a future hydraulic modeling scenario that evaluates the impact of wastewater flows associated with future growth, as well as redevelopment projects on the collection system. Maps will be developed showing current and future deficiencies.
- Review and document resulting capacity deficiencies for 20-year and build-out conditions. Use the hydraulic model to confirm the sizing of the backbone facilities to serve the North Shore.
- Evaluate the capacities of the pump stations in the hydraulic model for their ability to convey peak flows under firm capacity for existing and 20-year and build-out conditions. Pump stations not in the hydraulic model are assumed to have sufficient capacity.
- Update capacity deficiencies based on City field investigations or additional information, as needed.

### **Subtask 703 - Meeting No. 5 - Hydraulic Model Development & Capacity Evaluation**

Facilitate a meeting to review the hydraulic model development and resolve outstanding questions. City staff will confirm known deficiencies and identify any areas for additional City lead investigation (field visit, reference as-builts, etc.).

### **Subtask 704 - Draft and Final TM 1 - Hydraulic Model Update and Calibration**

Prepare draft TM 1 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 GSP.

### **Subtask 705 - Capacity Improvements**

Develop infrastructure recommendations to resolve deficiencies. Improvements will be sized for meeting build-out conditions and City criteria.

### **Subtask 706 - Meeting No. 6 - Capacity Improvements**

Facilitate a workshop to review capacity related collection system improvements. Highlight recommended improvements on system maps for discussion with City staff.

### **Subtask 707 - Draft and Final Chapter 6 - Collection System**

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 GSP.

#### Task 700 Assumptions

1. No remaining useful life (RUL) analysis will be performed.
2. Model calibration will focus on the STEP system and North Shore. The remainder of the system is considered calibrated from the 2024 GSP.
3. All portions of the collection system: gravity, STEP, and North Shore will be included in the hydraulic model.

#### Task 700 City Input

1. Requested Data from Task 701.
2. Comments on draft TM 1 - Hydraulic Model Update and Calibration.
3. Comments on draft Chapter 6 - Collection System.

#### Task 700 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft TM 1 - Hydraulic Model Update and Calibration.
3. ROC for TM 1 - Hydraulic Model Update and Calibration.
4. Draft Chapter 6 - Collection System.
5. ROC for Chapter 6 - Collection System.

#### Task 700 Meetings

1. Meeting No. 5 - Hydraulic Model Development & Capacity Evaluation.
2. Meeting No. 6 - Capacity Improvements.

## **TASK 800 - WASTEWATER TREATMENT FACILITY**

The purpose of this task is to define the condition and capacities of the WWTP's unit processes and facilities which directly impact the ability of the City to treat wastewater generated within their existing and expected future service area boundaries thereby managing the quality of effluent discharged to the Columbia River.

To inform the unit process analysis, additional information is required regarding the characteristics of existing wastewater influent received at the WWTP. This will be addressed through development and execution of a sampling and analysis plan in collaboration with City staff. This plan is also expected to include sampling at critical locations within the facility to provide additional detail regarding specific unit process performance. City staff will execute the plan with guidance from the Consultant. In addition, the Consultant will conduct a desktop reasonable potential analysis using the most recent effluent and receiving water information available (assumed to be data supporting the recent NPDES permit renewal application submitted to Ecology). The desktop reasonable potential analysis (RPA) will suggest potential limitations on future discharges from the WWTP that could impact plant capacity and composition of unit processes. A summary addressing the implications of these findings in the context of potential future implications on WWTP unit processes and facilities will be included in Chapter 7.

To address identified capacity and condition deficiencies, an alternatives analysis of the most viable improvement options will be conducted. Recommended projects and/or studies will be included in the CIP.

### **Subtask 801 - WWTP Historical Operations**

Summarize WWTP historical operations based on a review of data provided by the City in Task 400, input provided to the Consultant by City staff and information contained in the 2024 GSP.

### **Subtask 802 - Influent and Select Process Characterization Testing Plan**

Consultant will develop a wastewater characterization test plan to facilitate characterization of plant influent. This plan will incorporate limited sampling and analysis of selection locations within the liquid process as determined in collaboration with City staff. The City will execute this plan and provide data to the Consultant. Data will be used to calibrate the model developed in Subtask 804.

### **Subtask 803 - Meeting No. 7**

Facilitate a workshop to review influent and selection process characterization sampling and analysis efforts.

### **Subtask 804 - WWTP Capacity Analysis**

The objective of this Subtask is to determine the capacity of the existing treatment plant assuming: 1) current NPDES permit requirements, 2) current flow and loading conditions, and 3) projected future flow and loading conditions. A unit process analysis will be completed to identify shortfalls in plant capacity that will prevent the City from reliably treating and disposing of projected flow and loads at the end of the planning period (2045). A hydraulic analysis of the plant and river outfall utilizing Hydraulix® software will also be conducted. Activities associated with this task include:

- Evaluate process, design, and operational data for the facility liquids and solids treatment trains.

- Plan for and conduct tours of the facility to discuss operational protocols and data with City and operations staff. While on site, interview operations staff to identify operational issues and document any additional condition or capacity concerns not documented in the recent GSP (2024).
- Develop a calibrated a steady state biological wastewater treatment process model (e.g., Biowin) and use it to characterize the current performance of the City's WWTP during dry and wet weather seasons.
- Utilizing record documentation (drawings and basis of design reports, to the extent available) and data provided by the City, characterize performance of solids handling and treatment processes and equipment, as well as other mechanical elements of the WWTP liquid stream not included in Biowin model.
- Develop solids mass balance for facility.
- Evaluate hydraulic capacity of treatment plant elements and effluent outfall utilizing Hydraulix®.
- Develop one-page schematic of each process area that illustrates key equipment and overall unit process capacity.

#### **Subtask 805 - Meeting No. 8**

Facilitate a workshop to review and confirm capacity analysis findings.

#### **Subtask 806 - WWTP Condition**

Consultant will rely on information contained in the 2024 GSP summarizing the condition assessment completed as part of that effort and any additional information provided by City staff to identify WWTP condition related deficiencies. This information will be updated and used to inform the alternatives analysis to be conducted in Subtask 808.

#### **Subtask 807 - Desktop Reasonable Potential Analysis**

Utilizing data on effluent receiving water provided by the City in Task 401, the Consultant will perform a desktop analysis of reasonable potential for the future condition defined as 2045 (or the year identified as the endpoint for the planning period of this GSP study). Desktop analysis will be completed consistent with requirements for Tier II evaluation in accordance with WAC 173-201A-320 and Publication No. 11-10-073. This scope assumes the analysis will be limited to identification of potential capacity or process implications of reasonable potential suggested in results of the analysis. Analysis will be completed using Ecology tools that agency makes publicly available.

#### **Subtask 808 - Alternative Analysis**

The objective of this task is to identify, develop, and evaluate alternatives by process area that will maximize the use of existing assets at the WWTP and provide flexibility to meet potential future regulatory requirements. Activities associated with this task include:

- Based on basis of planning information developed in previous chapters, identify at conceptual level potential liquid and solids treatment process area alternative options for further evaluation. These will be organized and presented by process area based on deficiencies identified in Subtask 804.
- Document workshop results, decisions, and action items in meeting minutes.
- For up to two alternatives for each process area, perform the following activities:
  - » Consider process area layout requirements.



- » Compare hydraulic requirements to existing hydraulic profile and where necessary, perform hydraulic modeling between process units to identify required hydraulic improvements.
- » Define resulting dry and wet weather flow and loading capacities.
- » Review anticipated performance of the improvements.
- » Develop planning-level capital and life cycle costs.
- » Develop preliminary review of non-cost factors. (e.g., process reliability, permitting, flexibility and water quality considerations).

**Subtask 809 – Meeting No. 9**

Alternative development workshop with City and plant operations staff to develop and select liquids and solids process area improvements for evaluation.

**Subtask 810 – Meeting No. 10**

Alternative evaluation workshop to review technical performance, costs, and non-cost considerations associated for each alternative.

**Subtask 811 - Draft and Final Chapter 7 - Wastewater Treatment Facility**

Prepare draft Chapter 7 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 GSP.

Task 800 Assumptions

1. City provides bid costs of recent projects, if available, as one source for development of planning level costs for use in alternatives analysis.
2. City conducts influent characterization and select process sampling and analysis.
3. The City’s most recent GSP (2024, Carollo) includes a summary of an assessment of unit process and facility condition conducted in 2019. That summary identifies certain condition related deficiencies for significant unit process/operation facilities. This GSP update will rely on the findings of that condition assessment.
4. Capacity evaluation will be based on criteria contained in the 2023 version of the Orange Book (Ecology).
5. For desktop analysis described in Subtask 807, future effluent concentrations for constituents not currently regulated in the City’s NPDES permit (no existing effluent limitations or prohibitions) will be assumed to increase proportional to flow based on projections thereof developed in Task 400.
6. Approaches to process improvements to address findings of the desktop analysis (Task 805) involving constituents currently without limits or prohibitions in the City’s NPDES permit.

Task 800 City Input

1. Requested Data from Task 401.
2. Comments on draft Chapter 7 - Wastewater Treatment Facility.

Task 800 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 7 - Wastewater Treatment Facility.
3. Final Chapter 7 - Wastewater Treatment Facility.

### Task 800 Meetings

4. Meeting No. 7 - Facilitate a meeting to discuss scope of and responsibilities for an influent wastewater and select process characterization sampling and analysis effort.
5. Meeting No. 8 - Facilitate a meeting to review and confirm capacity analysis findings.
6. Meeting No. 9 - Prepare for and conduct an alternative development workshop with City and plant operations staff to develop and select liquids and solids process area improvements for evaluation. These could include:
  - a. Operational and/or process modifications to maximize existing secondary capacity.
  - b. Process improvements/additions to meet projected flow and load conditions.
  - c. Process improvements/additions to meet potential future regulatory requirements.
7. Meeting No. 10 - Prepare for and conduct alternative evaluation workshop to review technical performance, costs, and non-cost considerations associated for each alternative. As part of the meeting, select preferred improvement alternatives and discuss spreadsheet tool to be developed in Task 1000.

## **TASK 900 - OPERATIONS AND MAINTENANCE**

The purpose of this task is to document the City's I/I Program. Future I/I rates with and without the I/I Program will be estimated for use in the Collection System evaluation.

### **Subtask 901 - Data Request**

Data required to summarize and evaluate the City's current O&M program will be requested. Data may include:

- Organization structure.
- Staffing levels and positions.
- Summary of ongoing maintenance activities and operational tasks.
- Current O&M funding.
- Planned or future O&M programs.
- Record keeping procedures.
- Sewer main age and material.

### **Subtask 902 - Summarize and Evaluate O&M Programs and Problem Areas**

Update the City's O&M program, including both preventative and corrective maintenance. This includes the planned and scheduled activities, such as treatment plant preventative maintenance, biosolids management, lift station inspection and maintenance, manhole inspection and maintenance, video inspection, root cutting, grease removal, and hydraulic line cleaning. Summarize O&M problem areas based on City provided data, such accumulation of solids or access issues. Maps will be prepared to aid in the review of O&M problem areas. Summarize customer-oriented programs, such as fats, oils, and grease (FOG), and the City's procedure to address suggestions/complaints. This task assumes the City will provide written materials for use in summarizing the existing O&M Program. The task assumes the Consultant will not prepare new summaries or documentation.

Conceptually evaluate the ability of existing O&M programs to address problem areas within the short-term and long-term planning horizons with City staff in a workshop. Propose updated or new programs, if necessary, to address problem areas within the planning period. The purpose of this task is to aid the City in establishing the quantity of work needed and subsequent cost of the ongoing O&M programs. A detailed evaluation of individual programs is not envisioned in this task.

### **Subtask 903 - Draft and Final Chapter 8 - Operations and Maintenance**

Prepare draft Chapter 8 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 GSP.

#### Task 900 Assumptions

1. None.

#### Task 900 City Input

1. Requested Data from Task 901.
2. Comments on draft Chapter 8 - Operations and Maintenance.

#### Task 900 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 8 - Operations and Maintenance.
3. Final Chapter 8 - Operations and Maintenance.

#### Task 900 Meetings

1. None.

## **TASK 1000 - CAPITAL IMPROVEMENTS**

This Task will summarize the recommended improvements for the collection system, outlined in the previous tasks. Total project costs will be developed for each recommended improvement and ranked by priority. This task will develop Chapter 9 - Capital Improvement for the GSP.

### **TASK 1000 ACTIVITIES**

#### **Subtask 1001 - Cost Estimates**

Prepare a data request for the required information. The request is expected to consist of the following:

#### **Subtask 1002 - Project Prioritization**

Schedule identified projects for the three planning periods: existing, 20-year, and Build-out conditions. A summary table will present all CIP projects, year for construction, and estimated costs, and will be organized according to a recommended phasing plan. Maps will also be developed showing recommended future system pipes and facilities. Maps will include recommended projects color-coded by CIP phase and annotated with project identification numbers.

#### **Subtask 1003 - Meeting No. 11 - Capital Improvements**

Facilitate a meeting to review the CIP.

### **Subtask 1004 - Electronic CIP**

Develop an electronic CIP spreadsheet tool to include a full sheet on each project and a summary CIP for all projects. Project costs and timing will be linked such that City staff may revise costs and timing and the CIP will automatically be updated.

### **Subtask 1005 - Draft and Final Chapter 9 - Capital Improvement Plan**

Prepare draft Chapter 9 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 GSP.

#### Task 1000 Assumptions

1. City provides bid costs of recent projects, if available.

#### Task 1000 City Input

1. Requested Data from Task 1001.
2. Comments on draft Chapter 9 - Capital Improvement Plan.

#### Task 1000 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 9 - Capital Improvement Plan.
3. Final Chapter 9 - Capital Improvement Plan.
4. Electronic CIP.

#### Task 1000 Meetings

1. Meeting No.11 - Capital Improvements.

## **TASK 1100 - FINANCIAL**

The purpose of this task is to review and update Chapter 11 - Financial Plan, which will be conducted by FCS. Chapter 11 will identify the total cost of providing sewer service, assure that the utility improvement schedule will be implemented, and assist in establishing adequate fees for service. The financial program will be coordinated with the CIP.

### **TASK 1100 ACTIVITIES**

#### **Subtask 1101 - Data Collection and Validation**

Prepare an initial data request identifying financial and operational documents pertinent to the performance of the study. The Consultant will provide the CIP and relevant draft GSP chapters. Review, analyze, and validate data as necessary for use in formulating the technical analysis. Follow up with requests for any additional items or explanations as necessary.

#### **Subtask 1102 - Historical Financial Performance Review**

Review and document the financial operations (revenue and expenses) and financial condition (assets and liabilities) of the sewer utility for the previous 6-year period. Summarize noteworthy financial trends.

### **Subtask 1103 - Fiscal Policy Review**

Review the City's current fiscal policies for operating and capital reserves, system reinvestment funding, debt management, and debt service coverage.

### **Subtask 1104 - Capital Financing Plan**

Evaluate capital funding options and develop a capital financing plan for the 6-, 10-, and 20-year CIPs. The analysis will include a forecast of capital funding needs, borrowing requirements, and associated cash flows and cash balances over the study period. Evaluate and recommend an appropriate balance of funding from cash, system development charges (SDC), bonds, low interest loans and/or other available funding sources. Depending upon preliminary results, FCS will work closely with the Consultant and the City to perform sensitivity analyses for alternative scheduling of capital projects in order to smooth customer rate impacts. The budget provides for up to three scenarios.

### **Subtask 1105 - Operating Forecast**

The City's current sewer operating budgets will be used as the baseline for forecasting ongoing O&M costs, debt service, and other financial obligations of the sewer utility over the 6-year and 20-year study periods. Incorporate engineering planning growth forecasts and establish economic factors for cost escalation. Integrate additional O&M expenses, if any, resulting from the CIP and any other known changes in operational requirements.

### **Subtask 1106 - Revenue Needs Assessment**

Integrate fiscal policies, capital financing impacts and the operating forecast, and develop an operating cash flow projection for the 6-year and 20-year study periods. Compare forecasted financial requirements against forecasted revenue under existing rates to determine annual and cumulative revenue adjustments needed to ensure financial sustainability over time.

### **Subtask 1107 - Rate Forecast and Affordability Test**

Develop a rate forecast for the 6-year period. Apply annual rate adjustments to the City's existing sewer rate structures "across-the-board" to each rate class and rate charge (fixed and variable). Note: this scope does not include changes to the City's existing sewer rate structure. The Financial Chapter will include a narrative discussion of potential rate structure enhancements, if necessary. Perform an affordability test as an indication of a residential customer's ability to pay the existing and forecasted rates. This includes an analysis and comparison of the sewer system's existing and forecasted average residential bills to 2.5 percent of the median household income. This test will be conducted for the 6-year and 20-year study periods.

### **Subtask 1108 - Meeting No. 12 - Financial Review**

Review results over four remote meetings before finalizing the Financial Chapter. Meeting will be attended by FCS and Carollo.

### **Subtask 1109 - Draft and Final Chapter 10 - Financial Plan**

Prepare draft Chapter 11 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 GSP.

### Task 1100 Assumptions

1. City can provide elements listed under Task 1101.
2. This scope does not include changes to the City's existing sewer rate structure or SDC.

### Task 1100 City Input

1. Requested Data from Task 1101.
2. Comments on draft Chapter 11 - Financial Plan.

### Task 1100 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Draft Chapter 11 - Financial Plan.
3. Final Chapter 11 - Financial Plan.

### Task 1100 Meetings

1. Meeting No.12a, 12b, 12c, 12d - Financial Review.

## **TASK 1200 - GSP DEVELOPMENT**

The purpose of this task is to integrate comments on the GSP into a clear and comprehensive General Sewer Plan document. The City Draft Plan will be prepared, including an Executive Summary. This task includes assisting the City to coordinate plan review from Ecology. Under this task, the Consultant will assist the City with a public commenting period. Comments received from the public review meetings, adjacent sewer providers, Clark County, and Ecology will be incorporated into the updated plan for City Council's approval and adoption.

### **TASK 1200 ACTIVITIES**

#### **Subtask 1201 - Executive Summary**

Prepare an executive summary, summarizing each element of the General Sewer Plan.

#### **Subtask 1202 - City Draft Plan**

The plan will be developed as a City review draft and reviewed by City staff. Under this task, the plan will be prepared incorporating the previous chapters according to the summary table above.

#### **Subtask 1203 - Meeting No. 13 - City Review Comments**

Meet with City to discuss comments of draft document. Incorporate comments to be included into Agency Draft Plan.

#### **Subtask 1204 - Agency Draft Plan**

Incorporate City comments into an Agency Draft plan to be submitted for agency review. The City will submit Agency Review Draft to adjacent sewer providers, Clark County, and Ecology. Eight notebook binders, one camera-ready set, and one PDF will be developed for City reproduction and distribution of plan to agencies and adjacent purveyors.

### **Subtask 1205 - Meeting No. 14 - Agency Review Comments**

Meet with Agency to discuss comments on draft document. Incorporate comments to be included into Final Plan.

### **Subtask 1206 - Final Plan**

Consultant will review agency review letters for incorporation into the Final Plan. Delivery of the Final Plan will include one professional engineer (PE)-stamped original notebook binder, one PE-stamped original camera-ready set, seven PE-stamped reproduction notebook binders, one PDF, and all electronic files.

#### Task 1200 Assumptions

1. The City provides required documents for appendices, including acceptance ordinances.
2. City will collect public and agency review comments and deliver to Consultant. City will develop written responses received during Agency Review process.

#### Task 1200 City Input

1. City comments.
2. Public and Agency review comments.

#### Task 1200 Consultant Deliverables

1. Meeting Agendas, Materials, and Minutes.
2. Executive Summary.
3. City Draft Plan - One PDF.
4. Agency Draft Plan - Eight notebook binder, one camera-ready, and one PDF.
5. Final Plan - Eight notebook binder, one camera-ready, and one PDF

#### Task 1200 Meetings

1. Meeting No. 13 - City Review Comments.
2. Meeting No. 14 - Agency Review Comments.





## CONSULTANT BILLING RATES

### CITY OF CAMAS

#### 2025 WATER SYSTEM PLAN AND GENERAL SEWER PLAN

Carollo Engineers, Inc. billing rates and other direct expenses are defined in the tables below. These rates are for calendar years 2024 and projected through 2026. If the contract is extended beyond December 31, 2026, Carollo Engineers, Inc., reserves the right to modify the rates on an annual basis.

Project Role	Hourly Rate		
	2024	2025	2026
Senior Advisor/SME	\$295.00	\$310.00	\$325.00
Project Manager	\$262.00	\$275.00	\$289.00
Principal Professional	\$262.00	\$275.00	\$289.00
Senior Professional	\$226.00	\$237.00	\$249.00
Project Professional	\$204.00	\$214.00	\$225.00
Professional	\$191.00	\$201.00	\$211.00
Staff Professional	\$157.00	\$165.00	\$173.00
Senior Technician	\$159.00	\$167.00	\$175.00
Assistant Professional	\$149.00	\$156.00	\$164.00
Technician	\$145.00	\$152.00	\$160.00
Document Processing	\$111.00	\$117.00	\$123.00

Expense			
Project Equipment Computer Expense (PECE)	\$15.00/hr	\$15.80/hr	\$16.60/hr
Travel and Subsistence	At cost		
Mileage at IRS Reimbursement Rate	\$0.67 per mile effective January 1, 2024		
Subconsultant	Cost + 10%		
Other Direct Cost	Cost + 10%		