

**EXHIBIT A**  
**SCOPE OF WORK**  
**CITY OF CAMAS**  
**INFILTRATION AND INFLOW FOLLOWUP STUDY**

This exhibit describes a scope of work for completing an infiltration and inflow (I/I) follow-up study for the City of Camas (City) wastewater collection system. This study is intended to address the requirements shown in **bold, underlined** font in Section S4.E from the City's NPDES permit shown below:

***S4.E. Infiltration and Inflow Evaluation***

1. *The Permittee must conduct a study of inflow sources. The study must be submitted by May 15, 2016:*
  - *Quantify the level of inflow from each collection system basin or sub-basin in order to identify areas exceeding a peak day to monthly average peaking factor of 3.4:1 during the design rainfall event.*
  - *Determine the inflow related actions and projects necessary to reduce inflow in each identified sub-basin.*
  - *Describe policies and practices for removing inflow sources. Address both sewer customers and the public collection system. Include policies which consider where stormwater conveyance systems both are and aren't available and describe ordinance provisions necessary to effectively reduce inflow.*
  - *Estimate the cost for each major project.*
  - *Prioritize the list of projects to most cost effectively reduce the level of inflow to a peaking factor of 3.4:1 or less.*
  - *Propose a schedule for completing the inflow related actions and projects within the shortest feasible time frames.*
2. *Inflow Project List and Schedule. The Permittee shall implement the inflow strategy of its October 21, 2014, proposal. This includes completing initial and **follow-up studies of inflow sources in years one and five of the permit**, and accomplishing inflow*

*specific projects commensurate with the funding levels proposed for years 2 - 4 of the permit.*

Gray & Osborne completed the first I/I Study required in the permit in 2016. The 2016 I/I Study included the following elements:

- Flow Monitoring
- Pump Station Run Time Assessment
- Television Inspection
- Smoke Testing
- Physical Inspection

The 2016 I/I Study identified a number of infiltration and inflow sources, including cross connections with the storm system, manholes, area drains, and roofs as well as leaking, deteriorated sewer mains along Everett Street, Franklin Street, and the Mill Ditch. The City has completed projects to address many of the identified sources.

Per information from the City, Ecology has indicated that the I/I Follow-Up Study should include the following information:

- Reevaluation of current I/I, per EPA criteria, and comparison with findings in the 2016 I/I Study with a focus on inflow.
- Quantification of I/I-related peaking factors and comparison with the 2016 I/I Study.
- Summarize the I/I mitigation efforts to date and their impacts.
- Describe positive impacts that any I/I reductions have had/will have on the plant. For example, if peaking factors have been reduced, evaluate and document any plant capacity recovery and how that could translate to delaying capacity-related plant upgrade projects.

The proposed scope of work is described below.

## **PROPOSED SCOPE OF WORK**

### **Task 1 – Flow Monitoring Plan**

- A. Review and summarize pump station run time data for 24 pump stations.
- B. Review and summarize City wastewater treatment facility (WWTF) influent flow and rainfall records for the period of 2015 to 2019.
- C. Develop a Flow Metering Plan – A brief memorandum summarizing the review of pump station run time data and WWTF flow and precipitation

records. Consider the magnitude and return interval for storms and their impact on flows. Provide recommendations for flow metering locations and durations. (In general, the intent is to monitor flows in the same or similar locations as for the 2016 I/I Study; however, more (or less) time may be needed to capture storms of similar intensity as for the 2016 I/I Study.)

- D. Incorporate City comments and finalize Flow Metering Plan.

## **Task 2 – Flow Monitoring**

- A. Procure, manage, and install nine flow meters per the Flow Metering Plan. Measure and document 3 months of wet weather flows. Assume City supplies one portable flow meter and Gray & Osborne leases eight others as needed.
- B. Move meters up to four times during the 3-month period.
- C. Monitor flow meter readings semiweekly. Compare to WWTF influent flow records and precipitation data for the same periods.
- D. Remove and clean flow meters.

## **Task 3 – Infiltration and Inflow Follow-Up Report**

- A. Summarize previous identification of I/I sources and quantities, including those identified in the 2016 I/I Study, and their impacts.
- B. Document efforts to remove I/I completed since the 2016 I/I Study and their impacts.
- C. Evaluate and quantify I/I based on run time data, WWTF flow records, and new flow monitoring conducted. Compare to that identified in the 2016 I/I Study.
- D. Reevaluate current I/I, per EPA criteria, and comparison with findings in the 2016 I/I Study with a focus on inflow.
- E. Quantification of I/I-related peaking factors and comparison with 2016 I/I Study.
- F. Describe impacts that I/I reductions have had/will have on the plant. For example, if peaking factors have been reduced, evaluate and document any plant capacity recovery and how that could translate to delaying capacity-related plant upgrade projects.

- G. Provide recommendations for additional I/I removal.
- H. Submit initial draft report to City.
- I. Review City comments and submit final report to Ecology incorporating City comments.
- J. Review Ecology comments and submit final report incorporating Ecology comments (maximum of one round of revisions to incorporate Ecology comments is included).

#### **Task 4 – Meetings**

- A. Attend one meeting to discuss the Flow Metering Plan and one additional meeting to discuss the City's comments on the draft Infiltration and Inflow Follow-Up Report.

#### **Task 5 – Project Management/Quality Assurance/Quality Control**

- A. Provide project management throughout, and QA/QC review and key intervals for the project.

#### **ASSUMPTIONS**

- A. The City will monitor pump station run time from 2019 to 2020 and provide that data to Gray & Osborne. Gray & Osborne will identify key pump stations that should be monitored every day or every other day during peak storm periods (due to the requirement in the NPDES to identify *peak day to monthly average peaking factor of 3.4:1 during the design rainfall event.*)
- B. The City will provide one field crew member to assist with flow meter insertion/removal.
- C. It is assumed that, as in the 2016 I/I Study, it is not necessary to quantify flow in every subbasin, and that monitoring flow in basins identical or similar to that conducted for the 2016 I/I Study will be sufficient.

#### **SCHEDULE**

|                      |                                    |
|----------------------|------------------------------------|
| Flow Monitoring Plan | September 2019                     |
| Flow Monitoring      | November 2019 through January 2020 |
| Draft Report         | March 15, 2020                     |
| Final Report         | April 10, 2020                     |