



King County

Department of Natural Resources and Parks

Wastewater Treatment Division

Contract P00208P16

**Professional Services for Evaluation of Inflow and Infiltration
Reduction Concepts**

Phase 2:

Definition of Three I/I Program Concepts

Task 7000

Inspector Training and Certification Program Development

December 2021

Project 150258

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Revision History

Date	Rev	Reason for Revision
6/25/2021	Revised Draft	Incorporation of MWPAAC comments and WTD direction
7/19/2021	Revised Draft	Minor revisions to language and format
10/15/2021	Revised Draft TM V2	Minor revisions to language and format
12/13/2021	Final TM	Revision to language/format and incorporation of comments and new data

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Abbreviations and Acronyms

APWA	American Public Works Association
ASTM	ASTM International (formerly known as American Society for Testing and Materials)
BMP	Best Management Practice
CESCL	Certified Erosion and Sediment Control Lead
CIPP	Cured-in-Place Pipe
CPII	(APWA) Certified Public Infrastructure Inspector
CSI	(WTD) Conveyance System Improvement (Program)
E&P	(MWPAAC) Engineering and Planning Subcommittee
EPSC	Erosion Prevention and Sediment Control
ESJ	Equity and Social Justice
FTE	Full-Time Employee
GMP	Green Management Practices
I/I	Infiltration and Inflow
ITCP	(NASSCO) Inspector Training Certification Program
KSA	Knowledge, Skills, and Abilities
LACP	(NASSCO) Lateral Assessment Certification Program
MR	Maintenance Hole Rehabilitation
MWPAAC	Metropolitan Water Pollution Abatement Advisory Committee
MSD	(Louisville) Metropolitan Sewer District
NASSCO	National Association of Sewer Service Companies
NICET	National Institute for Certification in Engineering Technologies
NPDES	National Pollutant Discharge Elimination System
PACP	(NASSCO) Pipeline Assessment Certification Program
QPCI	(MSD) Qualified Post Construction Inspector
RWSP	(King County) Regional Wastewater Services Plan
SME	Subject Matter Expert
SSO	Sanitary Sewer Overflow
TM	Technical Memorandum
WTD	Wastewater Treatment Division
WWCPA	Washington Wastewater Collection Personnel Association
WWTP	Wastewater Treatment Plant

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1.0 Introduction

This technical memorandum (TM) presents considerations for elements of an Inspector Training and Certification Program to be developed by the King County Wastewater Treatment Division (WTD) under its Infiltration and Inflow (I/I) Control Program. This TM expands on previous work to further evaluate and refine various program elements that will enable local agencies throughout the region to ensure consistent, high quality side sewer inspections are conducted. The TM also addresses additional considerations that may influence how the Inspector Training and Certification Program is formulated.

This TM–Task 7000, Inspector Training and Certification Program Development–is part of a broader effort to reduce I/I entering the County’s sewer system through the *Evaluation of Inflow and Infiltration Reduction Concepts* project. The task builds on work documented in the following TMs:

- Task 410 *Verify 2004 King County Final Draft Regional I/I Control Standards, Procedures, and Policies*, October 2017
- Task 420 *Assessment of Existing Local Agency Sewer and Side Sewer Standards*, October 2017
- Task 430 *Approach to Achieve Common Sewer and Side Sewer/Lateral Standards*, February 2019
- Task 510 *Evaluation of Current Inspection Programs at Cities and Sewer Districts*, October 2017
- Task 520 *Outline for a Standardized Regional Inspector Training Program*, February 2019
- Task 600 *Private Side Sewer Program Identification and Relevance to the King County Wastewater Service Area*, April 2019
- Task 600 *Evaluation Process, Findings, and Outcomes*, April 2019
- Task 4100 *Program Development Plan*, April 2020

1.1 Infiltration and Inflow Control Program Overview

Reducing I/I is an ongoing goal for most wastewater utilities to effectively manage the collection system and control rate payer costs. I/I is defined as rainwater, surface water, and groundwater that flows directly and indirectly into sanitary sewers. I/I may also originate from unauthorized connections to the sewer system. This additional flow takes up capacity that would otherwise be used to convey wastewater. The additional operating and capital costs that result from the need for larger pipes, maintenance structures, and pump stations to accommodate higher flows are spread across all local agencies and their customers through WTD’s utility rates, fines, and cleanup costs associated with an increase in sanitary sewer overflow (SSO) events and annual wastewater treatment costs.

In 1999, as part of the Regional Wastewater Services Plan (RWSP), WTD established the I/I Control Program. This program was designed to reduce the amount of peak wet weather flow entering the County’s sewer system whenever such actions were determined to be cost-effective. Currently, the I/I Control Program focuses on portions of the conveyance system that have capacity deficiencies. Specifically, the I/I Control Program has developed methods to collect data to assess where localized I/I reduction might be a more cost-effective solution than increasing pipe and/or pump station capacity. To date, the I/I Control Program has been effective in select areas of the regional system by addressing localized I/I with this method.

Working in tandem with the I/I Program, WTD's Conveyance System Improvement (CSI) Program functions to develop separated conveyance system projects to accommodate the projected flows from WTD-supported service populations. King County provides wholesale wastewater conveyance and treatment services for 17 cities, 16 local sewer utilities, and one Indian tribe in King, Snohomish, and Pierce counties (local agencies).¹ These local agencies own and operate independent collection systems that include pipelines and pump stations to collect and convey wastewater from their respective service areas to King County's regional conveyance system for treatment and disposal.

CSI Program planning has identified conveyance system needs in the separated system where the existing capacity does not meet the current or projected flows. These flows include assumptions for future population growth and future I/I deterioration rates. CSI Program projects are proposed to address each conveyance system capacity need. A timeline and estimated project cost have been established based on a set of nine prioritization criteria² that include such factors as available capacity (as defined by level of service), operations and maintenance issues, and local agency input.

Per King County's conveyance system policies (King County Code 28.86.060), WTD uses the 20-year peak wastewater flow as the design standard for the separated portion of the regional wastewater system to accommodate increased flows and protect against SSOs. To meet this standard, facilities are designed to convey the peak flow that can be expected on an average of once every 20 years (i.e., a 20-year return interval). Under peak flow conditions, as much as 75 percent of the peak flow in the separated sewer system is estimated to be the result of I/I flows in the conveyance system.³

Based on national I/I surveys and historic King County I/I reports, a significant source of that I/I originates on private property, particularly from side sewers. As service areas are built out, and as the local collection system ages and deteriorates, the WTD conveyance system can expect to see increased flow from I/I. Consequently, conveyance system rehabilitation may be required sooner than expected after combining the increased I/I flows with additional sanitary flows from population growth.

1.2 Project Background

In 2015, the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) I/I Task Force (I/I Task Force) was created to formulate ideas for I/I programs that could benefit the regional wastewater system by looking at long-term solutions to significantly reduce and remove I/I from the regional sewer system as a whole. The I/I Task Force developed a list of recommended options for future regional I/I Control Program actions. That list provided the framework for the current work being performed as part of the *Evaluation of Inflow and Infiltration Reduction Concepts* project. This project is expected to complement ongoing rehabilitation and repairs completed as part of normal operations and maintenance, as well as location-specific I/I reduction efforts completed by component agencies and the County.

¹ The Muckleshoot Indian Tribe owns all sewer mains and side sewers within its service area. See Phase 1 Task 420 TM for more information.

² King County Department of Natural Resources and Parks Wastewater Treatment Division. Conveyance System Improvement Program, Program Update. 2017.

³ King County Metro. Wastewater 2020 Plus Infiltration/Inflow Existing Conditions. February 1994, pg. 13; and King County. Pilot Project Report. October 2004, pg. 1-3.

The goal of the project is to identify implementable, long-term solutions to decrease future I/I throughout King County's regional wastewater collection system. The work, to date, has been divided into the following phases:

- Phase 1, conducted from 2017 to 2019, reviewed a wide variety of program concepts and identified three I/I reduction concepts for further consideration:
 - Regional sewer and side sewer best management practices (BMPs)
 - Regional Inspector Training and Certification Program
 - Private side sewer inspection program with financial assistance
- Phase 2, initiated in 2019 and continuing through 2020, builds on the Phase 1 work and provides descriptions and considerations for those three identified programs to support discussions on scope and implementation. Results are not yet known, but may include:
 - Recommendations on side sewer BMPs for a web-based regional toolkit
 - Recommendations on regional Inspector Training and Certification Program content and expectations
 - Options defined for private side sewer inspection programs

1.3 Purpose

This TM documents the approach taken during Phase 2 to define a regional Inspector Training and Certification Program that may result in limiting the increase and/or reduce the overall I/I levels in King County's regional wastewater service area.

An overview of the regional data for inspectors and inspection programs across the region was provided in the Phase 1 Task 510, *Evaluation of Current Inspection Programs at Cities and Sewer Districts* TM. While the local agencies generally employ experienced construction inspectors, many agencies indicated that training is provided on the job⁴. There is currently no regional inspection practice standard for sewer mains, laterals, and private side sewers. Regional standardization of inspector training and inspection practices would provide a basic level of assurance that sewer infrastructure is constructed and repaired at a consistent level of quality across the regional service area.

The Phase 2, Task 4000, *Program Development Plan* TM provided an overview of the approach that would be taken under Task 7000 to develop this Inspector Training and Certification Program (Task 7000 TM). Concepts presented in the Task 4000 TM that helped define the Inspector Training and Certification Program include:

- Goals, Objectives, and Success Factors
- Implementation Risks and Barriers
- Outreach Plan
- Next Steps for Program Development and Implementation Planning

⁴ Through many years of sewer construction and inspection work

As part of the Task 7000 Inspector Training and Certification Program planning process, the Consultant team worked closely with MWPAAC, primarily via the I/I Task Force, to develop the following program elements presented later in this TM:

- General program scope definitions (**Section 4**)
- Requirements to complete training (**Section 5**)
- Program-related roles and responsibilities (**Section 6**)
- Program costs (**Section 7**)

2.0 Program Goals

An overview of the regional data for inspectors and inspection programs across the region was provided in the Phase 1, *Task 510, Evaluation of Current Inspection Programs at Cities and Sewer Districts* TM. One of the inspector-related findings of that work is that while the local agencies generally employ experienced construction inspectors, most have reported that training is obtained on-the-job, and few agencies use formal training for their inspectors. At present, there is no regional standardization for inspection practices.

Inspectors fill roles in sewer infrastructure construction and repair that include, but are not limited to, the following:

- Act as the onsite observer for the sewer agency.
- Enforce provisions of Contract Documents and Permits.
- Determine if materials and workmanship are in conformance with Contract Documents and Permits.
- Verify that the final field product meets the requirements of the sewer agency's Contract Documents and Permits.
- Interact with the public and other entities affected by the construction and/or repair work.

Standardization of inspector training and inspection practices would provide a basic level of assurance that sewer infrastructure is constructed and repaired at a consistent level of quality across the regional service area.

2.1 Program Goals

The goal of this program is to ensure, within reason, that all component agency sewer inspectors (staff or contractors⁵) are consistently trained and certified to inspect privately-owned side sewers that connect to the publicly owned separated sanitary sewer system and enforce proper installation, rehabilitation, and repairs to reduce I/I. Following discussion, consensus was reached among the I/I Task Force to include training on sewer connection inspection and side sewer inspections only. Mainline sewer inspections were not included as a topic because other entities (i.e., American Public Works Association [APWA]) already provide comprehensive training programs for mainline sewers. The program should be designed to, 1) ensure inspectors are fully aware of issues that could lead to increased I/I in the sewer system and, 2) provide methods to mitigate these issues. The program will not result in each component agency having the same procedures for side sewer inspection and approvals.

This program would be just one tool in the regional I/I reduction toolbox; however, the training program alone cannot eliminate excessive I/I that leads to increased capital investment needs and costs. A broader goal for the program is to ensure that it supports WTD's (and the component agencies) efforts to avoid significant conveyance system capital investments over the next 40 years by reducing future I/I in the wastewater system. If the region were to avoid hundreds of millions of dollars of capital investment by reducing future system I/I, sewer rates would increase to a lesser extent than they would if these conveyance projects were required.

⁵ The term "contractor" refers to a contracted service provider such as a field services contractor or consultant that is an employee of the local agency.

Developing and implementing a regional Inspector Training and Certification Program is expected to benefit WTD and the component agencies in several ways including:

- Reducing costly I/I in the regional and local sewer systems over time.
- Enabling WTD (and its component agencies) to establish a uniform set of tools with which to address I/I issues.
- Improving confidence in the structural integrity of sanitary sewers within the WTD service area due to high quality installation and repair verified through best practice inspection methods.
- Supplementing the inspection body of knowledge of the existing inspector pool.
- Setting common expectations and improving transparency between local agencies and WTD regarding sewer inspector levels of experience, knowledge, skills, and abilities (KSA).

Anecdotal evidence through previous work completed by the consultant team indicates that most regulators, when asked, are very supportive of, and have a higher level of confidence in, sewer agencies that have formalized training programs (of any type).

Additionally, King County National Pollutant Discharge Elimination System (NPDES) permits for wastewater conveyance and treatment include requirements for I/I reduction and control. The implementation of this training program, along with other I/I reduction efforts, would show that progress is being made toward removing I/I from the regional system.

2.2 Objectives

The objectives of this program are as follows:

- Establish minimum qualifications for inspectors across the WTD service area.
- Establish a voluntary Inspector Training and Certification Program for inspectors to demonstrate minimum qualifications that include both academic and hands-on components.
- Establish the frequency and method of certification renewal (e.g., certification test every 5 years).
- Integrate Equity and Social Justice components as part of program development and implementation.

2.3 Success Factors

The success factors of this program are as follows:

- Have 100 percent of side sewer inspectors and contracted inspectors⁶ trained and certified within 3-5 years of program launch.
- Reach agreement among majority of local agencies to participate in program development and meet training and certification requirements.

The I/I Task Force recognized by that the success factors are written as ideals, and if they are not achieved, it does not necessarily mean the program is not successful. For example, if 90 percent of inspectors from participating local agencies are trained and certified that would also demonstrate success. Likewise, if the majority of local agencies in high I/I areas participate in the program, that would also demonstrate program success.

⁶ A contracted inspector is anyone who provides paid construction inspection services to a sewer agency that is not a full- or part-time employee of the sewer agency.

These factors were refined through discussion with the I/I Task Force from the following preliminary success factors defined early in Phase 2:

- Have 100 percent of inspectors trained and certified by a defined date.
- Reach agreement among all local agencies to participate in program development and meet training and certification requirements.

2.4 Regional Effectiveness of I/I Prevention or Reduction

A gradual reduction of I/I sources is anticipated over a period of many years where new sewer construction and repair-related inspections occur (as described in the Phase 1, Task 520 TM). It is not possible to estimate the magnitude of the decrease or the potential decline in the rate of I/I increase that could be attributed to improved inspections. King County's decennial flow monitoring, hydraulic modeling, and measured flows at the wastewater treatment plants (WWTPs) are sources of data that may be used to evaluate effectiveness of any programs adopted to address I/I in the years to come.

In general, sewer construction and rehabilitation inspection training efforts advance the knowledge and practice of inspectors and provide a benefit to the community and public agencies by reinforcing basic industry-recognized best practices. Competently and thoroughly performed inspection services, which require technical expertise, knowledge of materials and methods, and sound judgement, are important components to achieve a high-quality end product.

To better link this training to effective I/I prevention and reduction, additional considerations beyond supporting inspectors' expertise include tracking inspector certifications and documenting the use of certified inspectors when sewer systems are repaired or modified. Such documentation is not being proposed now, but could be revisited in the future as a mechanism for the County to determine whether certified inspectors are used under the assumption that certified inspectors perform their work to a high standard that limits I/I.

3.0 Example Training and Certification Programs

This section presents an overview of three inspection-related training and certification programs utilized by sewer utilities in the United States. The purpose, scope, eligibility requirements, application process (if applicable), and cost (as available) for each program is described below. The programs include:

- APWA Certified Public Infrastructure Inspection (CPII) Program
- National Association of Sewer Service Companies (NASSCO) Inspector Training Certification Program (ITCP)
- Louisville, Kentucky, Metropolitan Sewer District (MSD) Training Classes and Certification Programs

It may be possible to leverage one or more of these existing training and certification programs as a prerequisite to participation in a regional program, and/or to partner with an outside organization to develop content, provide training services, and administer certification programs.

The Washington Wastewater Collection Personnel Association (WWCPA) training offerings were reviewed and determined to focus mainly on construction, operation, maintenance, and management of wastewater collection systems and facilities in support of its comprehensive Operator Certification Program. This training was not relevant because, at this time, WWCPA does not offer training or certification for conveyance system inspections. More research would need to be completed if there was a desire to partner with them in the development of this program.

3.1 APWA Public Infrastructure Inspector Certification

The purpose of the APWA's Certified Public Infrastructure Inspector (CPII) certification program is to promote quality infrastructure throughout the community by advancing the knowledge and practice of construction inspectors to benefit the community and public agencies. This certification program is intended for individuals who inspect the construction of public infrastructure (e.g., roadways, highways, utilities, bridges, dams) and facilities (e.g., pump stations, treatment plants, water storage facilities) and other types of construction work and materials to ensure compliance with plans and specifications. Duties may include observation, measurement, testing, and documentation.⁷ The APWA CPII Examination content outline is provided in **Appendix A**.



The CPII Program includes an eligibility application process, a multiple-choice test, and a recertification application process. Interested candidates must submit an application that documents compliance with the following requirements:⁸

- Minimum high school diploma or equivalent education certificate
- Minimum of 5 years of public infrastructure field experience⁹
- Continued agreement in writing to adhere to the APWA Standards of Professional Conduct and to affirm no history of felony convictions related to the practice of public infrastructure inspection

⁷ https://www.apwa.net/MYAPWA/Events/Professional_Development/Certification/Public_Infrastructure_Inspector__CPII_/Apwa_Public/Education_and_Events/Certifications/CPII.aspx?hkey=6d59f32b-cfc9-4c03-b92c-1f8a2f33298b

⁸ A copy of the CPII Eligibility Application can be downloaded using this link:
https://www.apwa.net/MYAPWA/MyApwa/Apwa_Public/Education_and_Events/Certifications/CPII__Applying.aspx

⁹ Relevant work experience is defined as work performed in the construction of public infrastructure (e.g., roadways, highways, utilities, bridges, dams), facilities (e.g., pump stations, treatment plants, water storage facilities), or other types of construction work and materials to ensure compliance with plans and specifications.

- Payment of the current application fee
 - Eligibility application fee (non-refundable) (APWA member-\$95, Non-member-\$145)
 - Examination fee (Place of Employment-\$300) or Testing Center (\$350)
 - Recertification application fee (non-refundable) (APWA Member-\$95, Non-member-\$145)

The APWA CPII certification is valid for 5 years. Certificate holders are required to earn a minimum of 50 credits of continuing education units (CEUs) and/or contributions to the profession. A tracking sheet is submitted during the renewal period to document activities that meet recertification criteria, along with the recertification application fee.

3.2 NASSCO Inspector Training Certification Program

The NASSCO¹⁰ ITCP is a standard national training and certification program that provides field construction professionals (i.e., consulting and municipal engineers, inspectors, and contractors) with comprehensive training and tools to understand and inspect trenchless pipeline renewal technologies.¹¹ The program currently has two focus areas for which separate certifications are available: cured-in-place pipe (ITCP-CIPP) and maintenance hole rehabilitation (ITCP-MR).



Participants who successfully complete the ITCP-CIPP training receive a certificate that is valid for 5 years. The cost of the initial certification is \$1,295 regardless of NASSCO membership status. Recertification for the ITCP-CIPP may be completed online; costs range from \$450/\$500 (members/non-members). Recertification may also be obtained by retaking the initial class (\$695/\$795).

Initial training for the ITCP-MR also costs \$1,295, and there are currently no requirements for recertification.

3.3 Louisville Metropolitan Sewer District Training Classes and Certification Programs

The Louisville Metropolitan Sewer District (MSD) has provided in-person and online training opportunities for its consultants, contractors, and customers for many years, as described below.

3.3.1 Stormwater and Wastewater System Inspector Training and Certification

As part of reorganizing its Inspection Program, MSD partnered with the National Institute for Certification in Engineering Technologies (NICET)¹² to develop an MSD-specific training and certification program for Stormwater and Wastewater System Inspection (**Figure 3-1**).

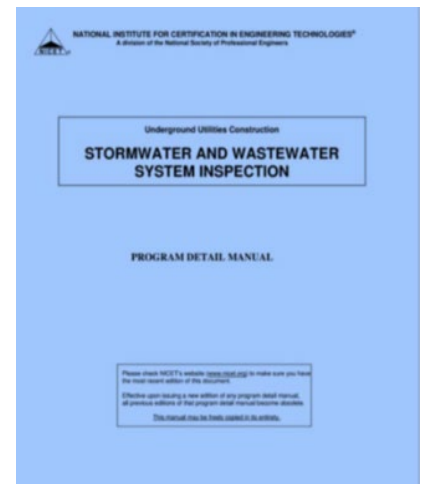


Figure 3-1. NICET Program Detail Manual for Louisville MSD Inspection Certification Program

Each MSD inspection supervisor and inspector was required to obtain NICET Certification within a given timeframe of employment (or promotion) to “incentivize” job knowledge enhancement and increase inspection proficiency. To increase staff retention, a progression path was created, and three levels of inspectors were (and are now) employed.

¹⁰ It is important to note that NASSCO is a privately-held for-profit trade organization and its training and certification program content may or may not be peer reviewed by industry subject matter experts outside of NASSCO membership.

¹¹ <https://www.nassco.org/content/inspector-training-itcp>

¹² NICET is an organization that was established in 1961 to create a recognized certification for engineering technicians and technologists within the United States.

Incorporating the NICET Certification process into job classification requirements resulted in increased accountability, more consistent standards, improved communications, and cohesive practices undertaken by capital, development, and enforcement inspectors. The cost associated with this program are not available.

MSD partnered with the Jefferson County Public Schools to facilitate this training throughout the region and NICET managed the certificates for MSD. The program was discontinued at the end of 2017 as the need for this training was no longer justified. NICET may redevelop some or all of this program upon request.

Similarly, NICET discontinued its standard Water and Sewer Line Certification Program at the end of 2017. This program targeted engineers and technicians engaged in the construction and inspection of underground water and sewer lines and was applicable to both private and public sector technicians. Topics covered in the training course included specifications and contract plan interpretation, field construction and installation techniques, field inspection and testing procedures, record-keeping and reporting, and supervisory duties. NICET may redevelop some or all of this program upon request.

3.3.2 Online Qualified Post Construction Inspector Training and Certification (Green Infrastructure)

MSD currently provides online Qualified Post Construction Inspector (QPCI) training and a certification examination for owners or managers of commercial properties in MSD’s service area. The eligible properties must have long-term maintenance and operation agreements that require regular inspection reports on Green Management Practices (GMPs).¹³

These reports can be submitted only by QPCI certified inspectors.

The online training module is free and provides information on common GMPs and their maintenance issues. The training includes quizzes and interactive exercises on completing sample inspection reports. (Figure 3-2). QPCI certification is earned by demonstrating an understanding of common GMPs and maintenance issues.

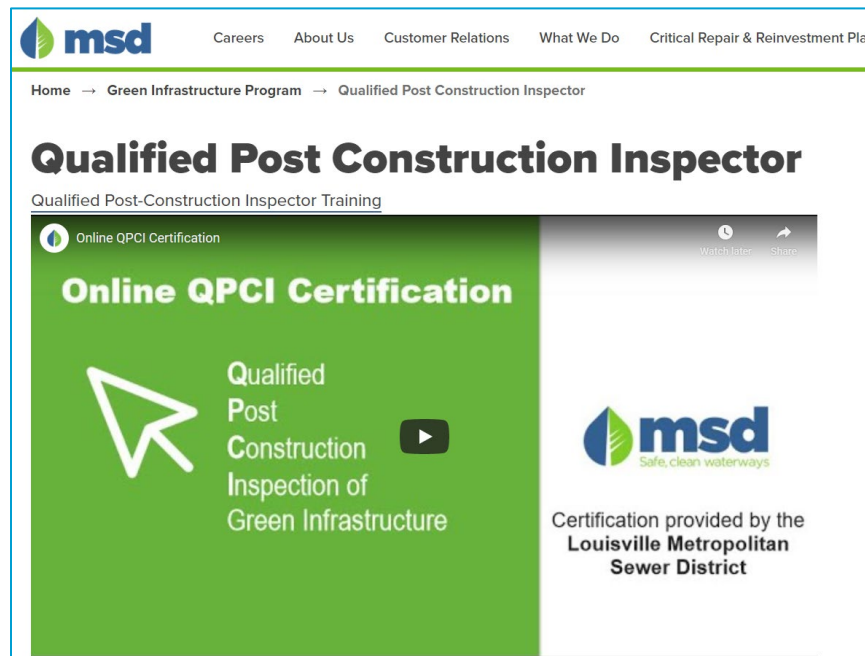


Figure 3-2. Louisville MSD Online QPCI Certification Website

¹³ For more information on MSD’s QPCI training course, see <https://louisvillemsd.org/green/Qualified-Post-Construction-Inspector>

3.3.3 Erosion Prevention and Sediment Control (EPSC) Certification

MSD prepares and conducts EPSC courses that provide training and certification relating to erosion control (EPSC Ordinance), as required by the Louisville and Jefferson County Metro Government Code of Ordinances. Certifications are provided single-lot residential construction demolition or Contractor. In addition, MSD provides training and certification for EPSC plan reviewers and preparers.

Table 3-1 summarizes current online EPSC-related online training.

Table 3-1. MSD EPSC-Related Online Training

Training or Certification	Program Description	Program Fee
MSD-Contractor EPSC Training	<ul style="list-style-type: none"> • Explains the EPSC measures to be installed on construction sites, as well as required paperwork. • Designed for the Contractor and the on-site responsible person tasked with the installation, maintenance, and inspection of BMPs required to comply with the EPSC Ordinance. • Curriculum includes the EPSC process, maintenance and performance requirements, administration and enforcement information, and the education and training requirements. 	\$95
MSD-Home Builder EPSC Training	<ul style="list-style-type: none"> • Designed for the home builder or person responsible for a land disturbance activity. • Addresses all land-disturbing activities associated with the construction or demolition of residential principle and accessory structures on individual lots. • Discusses the BMPs required to comply with the EPSC Ordinance. 	\$89
MSD-Certified Plan Reviewer/Preparer EPSC Training	<ul style="list-style-type: none"> • Covers the requirements of MSD's EPSC Ordinance and explains how to use the design aids. • Design aids allow the designer to accurately design EPSC measures that meet the 80% removal required by the ordinance. • Note: Licensed professional engineers and landscape architects are not required to take this class. 	\$95

4.0 Program Scope Considerations

The following sections describe key program scope considerations and present some of the risks and barriers to implementation related to basic program elements, as well as mitigation approaches that may lessen or remove these risks or barriers. The Inspector Training Program is not intended to implement new inspection protocols that would increase the time required for inspectors to complete their work; rather, the training program is designed to 1) ensure inspectors are fully aware of issues that could lead to increased I/I in the sewer system and, 2) provide methods to mitigate these issues.

4.1 Voluntary versus Mandatory Program Adoption

An inspector training program could be set up as voluntary or mandatory for existing local agency inspectors within the WTD service area. The most prevalent risk associated with the development of a voluntary inspector training program is that there is no guarantee that local agencies will employ inspectors certified by a regional inspector training program. A voluntary approach could also result in resources being spent to host trainings and exams that are then not attended by inspectors. A mandatory training program may mitigate this risk because local agencies would agree to or be required to participate. A voluntary approach is being recommended at this time and is expected to need participation from a majority of local agencies to achieve effective implementation.

If a private side sewer inspection program is developed in the future, and if this inspector training program is refined to support that program, then the reasoning for considering a voluntary or mandatory approach may be different. In addition, this program may have labor union and legal implications which are discussed below.

4.1.1 Labor Union Implications

Some inspectors are unionized, e.g., public employees, while others may not be, e.g., some private contractors. Also, existing labor contracts for unionized inspectors vary. Proposing either voluntary or mandatory training and certification for inspectors is expected to have implications for labor union bargaining. To support bargaining, the following will be needed:

- Standard learning objectives (KSA required)
- A training curriculum (standards of inspection)
- Discussion on whether this training program is the only way to learn these skills

The County can evaluate the need and bargain with its unionized employees, as appropriate. Each component agency would need to evaluate whether the requirement of this training triggers bargaining within their affected employee unions. Some component agencies may have multiple unions, thereby increasing the level of effort.

4.1.2 Legal Implications

The County's authority to implement I&I reduction projects and programs is defined by the intersection of five legal requirements:

- Provisions contained within the County's NPDES permits for operation of its wastewater collection and treatment system and discharges of effluent to state waters.
- Provisions contained within the County's contracts with component sewer districts to convey and treat wastewater.
- Provisions within King County codes describing the reasonable regulation of I/I.

- Provisions within King County codes requiring that the Water Quality Fund (representing moneys collected from component agencies and associated other sources) be spent in a manner described in the County’s comprehensive sewer plan that benefits the agency and its ratepayers.
- Provisions in state law, and an accompanying Attorney General’s opinion, regarding gifting of public funds.

King County has the authority to enforce provisions of its sewer contracts with local agencies. Existing sewer contracts do not require component agencies to employ certified inspectors, to set minimum qualifications for inspectors, or to direct how local agencies regulate their local wastewater system. Existing sewer contracts do, however, require local agencies to invest in their infrastructure for the purpose of preventing, reducing, and eliminating the entry of extraneous water into such facilities.

The existing sewer contracts draw a distinction between the “Metropolitan Sewerage System” and “Local Sewerage Facilities.” The Metropolitan Sewerage System is defined as the facilities and programs used by WTD to implement the RWSP. Local Sewerage Facilities are defined as facilities owned or operated by a Participant for the local collection of sewage to be delivered to the Metropolitan Sewerage System.

Under the sewer contracts, WTD’s rates must be based on the cost of administration, operation, maintenance, and repair or replacement of the Metropolitan Sewerage System. The existing sewer contracts also require each local agency to be responsible for the construction, maintenance, and operation of its Local Sewerage Facilities. The Washington State Supreme Court has interpreted the existing sewer contracts and has stated that under Washington caselaw and the existing contracts, WTD’s expenditures must primarily benefit WTD and its ratepayers and have a sufficient nexus to the goals of sewage treatment.

WTD would need to conduct an analysis of the governing legal provisions to identify the appropriate legal basis for implementing an Inspector Training and Certification Program. It appears that this program could potentially be justified as either a mandatory program or a voluntary program for the component agencies to implement. Different legal requirements would need to be satisfied to implement a mandatory program relative to a voluntary program. Until the legal analysis is completed, the County cannot commit to either a mandatory or voluntary program.

4.2 Minimum Inspection Requirements

Setting up minimum inspection requirements for the King County region was initially considered, however, this component was not pursued as the County cannot dictate how local agencies construct, maintain, and operate their Local Sewerage Facilities. This training can be focused on general inspector education (recognized industry and local best practices), and not on agency-specific codes or enforcement, as those vary by agency.

In the future, if there is a need to link this training to a private side sewer inspection program, then the need for minimum inspection requirements may be revisited. These requirements could incorporate the minimum testing and inspection requirements from industry leaders (e.g., ASTM, APWA, Environmental Protection Agency, NASSCO), as appropriate.

4.3 Scope of Training and Certification Examination Topics

The list of duties performed by sewer utility construction inspectors charged with inspecting sanitary sewer installation, repairs, and replacement projects is extensive (**Appendix B**). While many of these duties do not have a direct correlation with the potential to prevent or reduce I/I from entering the sanitary sewer system,

there are some duties that may have a direct correlation. These duties are shown in **Table 4-1** (see **Appendix B** for complete list of duties).¹⁴

Table 4-1. Recommended Inspection Practices with Direct Correlation to I/I Prevention and Reduction

Core Duties	Related Component
Review the Plans, Specifications, Permits, Applicable Laws, Safety Regulation and Applicable Codes	<ul style="list-style-type: none"> • Special Provisions: unusual requirements, soil reports and boring data • Notes on the Plans: References to Standard Plans • Standard Specifications • Reference Specifications • Standard Plans • Applicable Codes • Submittals
Review Other Information	<ul style="list-style-type: none"> • Grade Sheets
Inspect the Work Site	<ul style="list-style-type: none"> • Utility Mark Outs • Assess Potential Inflow Sources to the Sanitary Sewer
Implement Project Controls (Sampling and Testing)	<ul style="list-style-type: none"> • Soil Compaction Testing • Concrete Testing • Pipeline Testing (air, vacuum, water, closed-circuit television (CCTV), mandrel, etc.)

Careful consideration should be given to the topics related to inspector duties that will be covered in the training program and included on the certification examination. These topics should align directly with construction and inspection practices related to ensuring sewer systems are watertight. The time and effort associated with developing the training program and certification examination will be directly affected by the complexity of the topics included. Consequently, the time and effort required of those participating in the training will also be directly affected. See **Section 3** for examples of topics used in several well-known Inspector Training and Certification Program programs. The following list of potential training topics was presented to I/I Task Force members on February 1, 2021:

- Mainline sewers–inspections conducted on new installation, spot repairs, sewer and maintenance hole rehabilitation, and sewer and maintenance hole replacements
- Sewer connections–inspections conducted on new connections, spot repairs, connections associated with mainline rehabilitation, and connection replacements
- Side sewers–inspections conducted on new installations, spot repairs, and side sewer rehabilitation, replacement, abandonment, and repurposing
- Side sewers–visual condition assessment inspection (via a push camera)
- I/I sources on private property–inspections conducted on private property for unauthorized connections (i.e., roof leaders, sump pumps, foundation drains, surface drains, driveway drains, window well drains, etc.)

In addition to discussing each potential training topic, the I/I Task Force identified the targeted training program participants, and what type of inspection would apply to each. The target audience for the training is experienced staff or contractor inspectors used by local agencies where contractors are defined as inspectors hired by the local agency to work on their behalf, rather than employed directly by the local agency. For example, it may not be appropriate to require plumbers and side sewer contractors to be trained and tested on mainline sewer inspection. The training is not intended for entry-level staff or those without experience looking to get into a new career. See **Section 5.3.1** for a summary of a separate concept for an inspector-in-training program.

¹⁴ Not all I/I-related core duty components may be applicable to every local agency.

Following discussion, the I/I Task Force consensus was reached to include only training on sewer connection inspection and side sewer inspections. Mainline sewer inspection was suggested not to be a topic because other entities (i.e., APWA) already provide comprehensive training programs for new mainline sewer construction. I/I source inspection was suggested not to be a topic because of the legal issues related to accessing private property, and because not all local agencies are experiencing peak rates of I/I within their collection systems that warrant investigating possible private property sources. It is recognized however, that local agencies experiencing high peak I/I rates could benefit from training on how to identify and quantify sources of I/I that are located on private property and could use that information when developing cost-effective approaches for localized I/I reduction. Inflow sources have a much bigger impact on peak wet weather flows than infiltration.

Table 4-2 presents a breakdown of proposed training modules and general topics based on the I/I Task Force discussions. A further breakdown of the topics would be developed during implementation. For example, as part of the Inspection Methods and Standards module, proper pipe installation and pipe laying methods could be presented, as well as approved versus non-approved materials.

Table 4-2. Proposed Inspector Training Module Topics

Module	Training Topics
1. Introduction to the Regional Inspection Certification Program	<p>This module provides an overview of the inspector certification process and outlines what is required for each agency to submit to WTD under the Local Public Agency Program. This module covers:</p> <ul style="list-style-type: none"> • Regional inspector training: what is the purpose and benefit of this program • WTD reporting requirements for inspection results • Standard drawings, details, record drawings, permit requirements, and other guidelines (including when there are no guidelines)
2. Inspection Methods and Standards	<p>This module outlines the methods typically used to complete inspections, including:</p> <ul style="list-style-type: none"> • Reviewing construction methods and materials • Understanding and interpreting internal inspection results (via lateral launch and push cameras) • Knowing what to look for when inspecting a spot repair or lateral/side sewer modification • Conducting condition assessments: defect severity levels and what level of defect requires additional repair • Knowing other items to inspect on site: possible I/I sources • Identifying shortcuts taken by contractors that may increase I/I risk
3. Testing Standards	<p>This module covers how an inspector properly completes/oversees testing of various sewer components, including:</p> <ul style="list-style-type: none"> • How to properly complete a vacuum test • How to properly complete an air pressure test • How to properly complete a water leakage test • How to properly complete an internal visual inspection
4. Construction BMPs	<p>This module discusses various construction and repair methods for inspectors to be fully aware of the limitations of each method. Topics could include:</p> <ul style="list-style-type: none"> • Cured-in-place pipe (CIPP) lining BMPs (mainline, laterals, and side sewer) • Pipe-bursting BMPs • Grouting BMPs • Spot repair BMPs • Lateral and side sewer repair BMPs • Adapting to recent changes to other industry BMPs and regulations • Lateral sewer connection BMPs
5. Safety Issues and Customer Service	<p>This module focuses on safety considerations that inspectors must take into account. Topics could include:</p> <ul style="list-style-type: none"> • Washington Dig Law (Call 811 Before You Dig) • Crossbores: how to address situations where gas lines, fiber-optic lines, and other utilities have bored through sewer mains, laterals, and/or side sewers • Worksite safety risks and mitigation methods • Confrontation training: what to do if a contractor pushes back • Effectively communicating with property owners/occupants with diverse backgrounds

5.0 Program Requirements

This section presents suggested requirements for attending training sessions and taking the certification exam.

5.1 Minimum Qualifications for Inspectors to be Eligible for Training and Certification

The purpose of considering minimum qualifications to be eligible for the training is to ensure training program participants have the requisite knowledge and experience to fully understand and comprehend the training materials presented. Minimum qualifications will increase the effectiveness of the training and certification program and recognize the importance of the inspectors' role in ensuring high quality work products. Minimum qualifications also focus the time commitment for participation allowing for less training time (on the order of ten hours). If minimum qualifications were not included, it was assumed that there would be more training topics required and significantly more training time (on the order of hundreds of hours). Prior to attending a training program, the trainee should possess a minimum understanding of sewer construction and inspection standards. To establish a baseline for when personnel would start the formalized training program, the minimum KSAs required for sewer construction inspectors are proposed as follows:

- Knowledge of appropriate methods, technologies, and materials used in sewer installation and maintenance
- Knowledge of local, state, and federal building codes related to plumbing and sewer systems, construction principles, techniques and procedures, occupational hazards, and safety precautions
- Knowledge of sewer codes regulating installation and maintenance of sewers
- Basic computer skills, including use of handheld mobile devices, PC, and other data collection devices
- Ability to read and interpret plans and specifications of sewer lines and systems
- Individual physical capabilities commensurate with the demands of the job
- Strong organizational skills and understanding of task assignment and schedule; working knowledge of critical path method scheduling
- Excellent written and verbal communication skills

A simple eligibility application form should be available online for downloading and printing. The form should be developed so that it could be filled in and printed for mailing or completed and submitted online in its entirety. Further details on the specific content, mailing address, and any associated application fees will be considered as part of the program Implementation Plan.

5.1.1 Examples of Minimum Required Qualifications for Inspectors

While local agencies set inspector qualification requirements to address agency-specific issues and needs, (e.g., ensuring sewer systems are watertight), the following examples of recent job postings show that inspector positions are not entry-level, and a base level of inspection knowledge and/or related experience is required. For example, in 2021, the City of Auburn, Wash., posted an opening for a Construction Inspector with the following minimum qualification requirements:

- Possess an Associate Degree in Engineering Technology, or related field, and 1 year of field experience, or have 5 years of experience in a related construction field
- Possess and retain a valid state driver's license without impending loss at time of appointment
- Must be able to obtain a Certified Erosion and Sediment Control Lead (CESCL) certification from an authorized Washington State Department of Ecology course within 6 months of employment

Similarly, the City of Tacoma, Wash., posted a job description for an Environmental Services Construction Inspector position within the Field Operations Group in the Environmental Services Science and Engineering Division in late December 2020. This position will provide inspection services for the capital improvement projects of the Tacoma's Wastewater, Surface Water and Solid Waste Utilities. Qualifications for this position require the following as a minimum:

- Graduation from high school supplemented by college-level courses related to inspection work, *and*
- Three years of experience in field or office engineering work involving construction phase reviews

Many construction inspector positions in the private sector typically require a technical degree, diploma, certificate, or equivalent in a related field, or equivalent combination of education and construction experience. A minimum requirement of 8 to 10 years of experience is common.

5.1.2 Recommended Minimum Required Qualifications

The initial proposed minimum qualifications for eligibility to participate in the King County Regional Certified Inspector training program are as follows:

- Graduation from high school or high school equivalency credential
- Ability to read blueprints, basic computer knowledge, and general course work related to inspection, and
- Documented minimum of 5 years of experience in field or office engineering work involving sewer construction, repair and/or rehabilitation work

The I/I Task Force evaluated the initial recommendation of minimum required qualifications. Task Force members discussed what their local agency minimum requirements are currently, and what other qualifications could be evaluated. The I/I Task Force considered the nature of the training and the impact of lowering the level of qualifications on the content that would have to be included for the training to make sense and be delivered effectively to the trainees. In general, the training duration would be shorter if the trainees are held to higher minimum qualification requirements.

Based on I/I Task Force input, the recommended minimum qualifications remain the same; however, during the implementation phase, the eligibility application will be crafted so that there is flexibility in how equivalent experience is gained and how KSA is demonstrated. Additionally, there will be the option for local agencies to endorse including an employee who is highly experienced in inspecting other types of infrastructure, but who may not meet the minimum qualifications in the training, or who may be involved in local agency-directed relevant training programs. (See **Section 5.2.2** Test Out Option, and **Section 5.2.3** Equivalent Experience, for other ways in which the minimum required qualifications issue is addressed.)

5.2 Certification Examination and Recertification Requirements

This section describes the requirements for certifying and recertifying inspectors and provides a possible method for maintaining lists of certified inspectors. The purpose of including a certification element is to recognize the experience, knowledge, and education of inspectors based on an objective, third-party assessment of their skills and to enhance their professional credibility.

Some I/I Task Force members indicated their inspection staff see value in certification, while inspectors with one local agency do not see value. If the outcome of discussions with the I/I Task Force and MWPAAC Subcommittee indicate that a certification element is not desired or appropriate, then other methods of refreshing inspector knowledge on sewer connection and side sewers may be investigated. These methods may involve developing and presenting initial training modules and half-day refresher training modules and providing participation certificates.

5.2.1 Certification Examination

Inspectors who complete the training program are anticipated to be eligible to take the certification examination. It is recommended that once the curriculum of the training course portion of the program and key content are identified, a certification examination could be drafted. It is acknowledged that not everyone performs well on tests, and the examination could be developed to have equitable approaches to testing. Questions should be written in accordance with the examination *Items Writing Guidelines* provided by the Association of Boards of Certification.¹⁵ These guidelines are commonly followed when developing examinations for water and wastewater professionals. They use multiple-choice test questions, cover a large amount of content, are easily scored, and can measure a wide amount of information.

A minimum passing grade should be identified that corresponds to the complexity and length of the examination. For example, a passing grade of 80 percent may be appropriate for a 10-question examination with simple and straightforward answers, but a lower overall score may be appropriate for one that is longer or more complex.

A hard-copy certificate could be presented to inspectors who successfully pass the examination. In addition, when appropriate, the inspector's employer could be notified so that they can track individuals who completed training and passed the examination. A master list of inspectors could be maintained by WTD in either a spreadsheet or database that includes contact information, employer, training completion and examination dates, locations, test scores, etc. Further details related to the inspector training and certification tracking system will be considered as part of the program Implementation Plan.

5.2.2 Test-Out Option

A process could be established to streamline the certification process for experienced (seasoned) inspectors. This process could include requiring the experienced inspector to provide documentation of both relevant work experience from their current (and/or previous) employer(s) and successful completion of the certification examination (with a set minimum passing grade). Care must be taken when establishing acceptable documentation of experience so that personal information outside the scope of each inspector's ability to perform the relevant job duties is not required. For that reason, an employment verification check can be used to confirm employment history, but references and subsequent checks should not be required.

5.2.3 Equivalent Certification

After the experience, knowledge, and education requirements for certification have been determined, the County should recognize equivalent certifications. For example, if certification requirements are based off of, or in line with those of the APWA CPII, then such equivalent certifications should be acknowledged for any inspectors who have earned these certifications. In turn, they could be exempted. This determination will be made during implementation planning, in parallel to the training module development.

Equivalent certifications, such as the APWA CPII, should be recognized, and inspectors who have earned these certifications could be exempted from certain training and examination topics for as long as their equivalent certifications are valid. However, training should still be required for regionally-specific topics not covered under the equivalent certification and completion of related examination questions. For example, regionally-specific topics may include certain construction and repair BMPs, testing methods, and internal inspections related to side sewers located on private property.

¹⁵ http://www.abccert.org/about_ABC/Publications.asp

Training modules, provided either in-person or online, can be developed to address regionally-specific issues and local best practices. A regionally specific section of the certification exam may also be developed accordingly and could be offered as a stand-alone examination.

It is proposed that the following available training programs be reviewed for equivalency:

- APWA CPII
- NASSCO LACP

Other training and certifications may be identified and evaluated by a designated review committee in the future.

5.2.4 Recertification

Consideration should be given to the frequency of certification renewal for inspectors. The renewal period should be associated with the anticipated changes in regional inspection practices, noting that stand-alone training modules and examination questions could be developed to reflect these changes. The recertification process could require an inspector to complete only training modules that cover materials newly added since their initial certification or latest recertification period, rather than to complete the entire training program or take the complete certification examination multiple times. This issue should be further evaluated during the development of the Implementation Plan.

The initial recommendation for recertification period for inspectors is every 5 years. This is less restrictive than APWA CPII and NASSCO requirements, but is appropriate for the content included in the training program. Certified inspectors could be notified when training opportunities on new content is available should they chose to complete the training prior to their recertification period.

When the recertification issue was discussed with the I/I Task Force, members indicated that the 5-year timeframe is reasonable. Therefore, the Consultant Team's recommendation was not changed.

5.3 Equity and Social Justice Opportunities

The vision for Equity and Social Justice (ESJ) is a King County where all people have equitable opportunities to thrive. The strategies as 'One King County' to advance ESJ are to invest upstream and where needs are greatest: in community partnerships, in employees, and with accountable and transparent leadership. There are opportunities to improve both access to and delivery of the inspector training and certification program.

5.3.1 Increasing Accessibility

Sewer inspectors traditionally have numerous years of experience working in the industry before becoming an inspector. This experience includes both on-the-job training and technical education. Access to and participation in this career path could be increased within the Inspector Training and Certification Program framework by exploring an Inspector In-Training Program.

This type of entry-level training program would be separate from the inspector training being proposed in this TM and could be an introduction to the inspector career path and also preparing participants to meet the minimum qualifications the regional inspector training and certification program. The program may take lessons from the County's Operator-In-Training program. If an Inspector-In-Training Program is intended for non-County employees, then a cost benefit review would need to be completed. The County could explore an Inspector In-training Program for future County employees particularly if there is a strong need for experienced hires.

Priority populations, as defined by the County, are low-income communities, communities of color, and those with low English proficiency. Inspector positions with local sewer agencies require English proficiency to read plans, communicate with property owners, and coordinate with work teams. To broaden the range of eligibility for inspector positions and for the Inspector In-Training Program, there should be a consideration of English language learning opportunities. Additionally, incentives or discounts could be provided to participants from low-income communities or communities of color to incentivize participation.

5.3.2 Program Delivery

Inspectors regularly interact with diverse communities through their work. Culturally responsive communication would support inspectors in these interactions. A training topic is included in Module 5: Safety Issues and Customer Service, that grows inspector's skills in effectively communicating with property owners and occupants from diverse backgrounds.

The program could also be delivered fully online. This would maximize participation from potential participants who face barriers related to transportation, childcare, or non-traditional working hours. Online participation could also minimize any disruption to an inspector's current workload and also lower the costs that local sewer agencies might bear to have their inspectors participate and become certified.

5.4 Possible Training Methods

The purpose of considering training methods during program development rather than during implementation planning is that it helps to better define ways local agencies will interact with the training program. For example, if a training program is comprised of 80 hours of in-person instruction and offered only once or twice a year, the program may be less desirable than an online course that requires just 7 hours of instruction and can be completed at the convenience of trainees and their employers. By identifying training methods that would be least disruptive to local agencies, there is a greater opportunity to formulate a sustainable training program.

An integrated, holistic approach is recommended to establish an inspector training program that incorporates a diversity of knowledge and ability levels with required skills, current regional approaches, and industry best practices. As demonstrated by the examples provided in **Section 3**, there are many ways in which the training program can be presented, and the examination can be administered. Factors that influence the selection of the training method may include target audiences, mobility issues, social distancing requirements, and other physical restraints. This section will describe considerations associated with the following training methods:

- In-person training
- Online training
- Hybrid online and in-person training

It is important to recognize the following preferred learning styles of adults when considering how to present the training program:

- **Visual** learners need to see simple, easily to process diagrams or written words.
- **Aural** learners need to hear something so that it can be processed.
- **Print** learners process information by writing it down.
- **Tactile** learners need to do a related task in order to learn the material.
- **Interactive** learners need to discuss learning concepts to gain a full understanding of an issue.
- **Kinesthetic** learners need to be moving in order to learn.

5.4.1 In-Person Training

In-person training enables training participants to interact more closely with their instructors. Such training should be provided by subject matter experts (SMEs) who are experienced with formal training in construction inspection best practices and knowledge of local issues. The instructors should foster a culture of learning, participation, and open and clear communication. In-person training programs typically require more time than online training due to many factors including instructor/student discussions, group activities, field exercises, breaks, and other distractions. It is estimated that the time to complete in-person training for the proposed curriculum is 20 to 24 hours.

An in-person training program that addresses the preferred learning styles of adults can be crafted by incorporating teaching methods shown in **Table 5-1**.

Table 5-1. Possible In-Person Training Methods

Teaching Method	Features
Case Study	Participants practice problem-solving with relevant examples. Participants use high-level cognitive skills (e.g., evaluation, analysis) and form arguments and counterarguments.
Coaching	Participants apply knowledge on the job, unlock participant potential, increase knowledge sharing, and reinforce other training methods.
Discussion	Participants evaluate two or more positions on an issue, practice critical thinking, draw on participants' own experiences and expertise, form arguments and defend positions. Some discussions consist of an expert panel, which allows learners to understand discipline nuances and areas of debate, relate knowledge to real world examples, and listen to multiple opinions on a topic.
Field Exercise	Participants receive and respond to immediate feedback, develop process skills, practice physical or manual skills and evaluate results of own work.
Lecture	Instructors convey information to supplement participant reading or self-study, respond to student misconceptions or difficulties, and stimulate interest in a new area.
Simulation	In-person or via technology, simulations demonstrate the application of participant knowledge to different scenarios (field setting or role plays). A field setting (real or simulated) would be required for an SME to facilitate the exercise and give feedback.
Small Group Activities	Group training provides hands-on skill building and problem-solving opportunities. Participants are divided into small groups and assigned a timed task to complete as a team. The output of these activities is shared with the larger group.
Table Top Exercise	A combination of other methods, table top exercises provide a simulated experience with a situation acted out. Gives opportunities for participants to develop solutions to unpredictable situations and conditions.

Table 5-2 presents common course materials that are often developed to support in-person training programs.

Table 5-2. In-Person Course Materials

Material Type	Material	Description
Learner	Activities and exercises	<ul style="list-style-type: none"> • Provide immediate practice opportunity for new skills • Allow instructor/facilitator to monitor transfer of learning and adjust pace
	Handouts and workbooks	<ul style="list-style-type: none"> • Support course instruction • Provide post-course reference
	Presentations	<ul style="list-style-type: none"> • Used to support verbal presentation and reach visual learners
	Visual aids	<ul style="list-style-type: none"> • Graphics, flow charts, process flows, checklists to be used for quick reference after the course
Instructor and Administrative	Course description/agenda	<ul style="list-style-type: none"> • May be two separate documents or one combined document and describes the course content • Sets expectations for the course • Includes duration, breaks, objectives, prerequisites
	Supplemental Instructor Materials	<ul style="list-style-type: none"> • Provides step-by-step directives on facilitating hands-on activities and field demonstrations
	Course Evaluations	<ul style="list-style-type: none"> • Measure participant's reaction to various aspects of the training including satisfaction with content, instructors, learning environment, as well as feeling of material appropriateness for learner group • Measure the achievement of learning objectives
	Record keeping instructions	<ul style="list-style-type: none"> • Ensures proper records are created and maintained in a secure environment
	Sign-in sheets	<ul style="list-style-type: none"> • Participants document training attendance

Logistical issues that must be considered for conducting in-person training sessions can be complex, and may include, but are not limited to the following:

- Where will the training be held? Will the training site move throughout the region? Will it be easily accessible via public transportation? Will there be available space for a field component/hands-on exercise (e.g., pipe pressure testing)?
- Who will set the training schedule and how often will it be held?
- Will interpreter(s) be needed? If so, who will coordinate?
- Who will coordinate with the training venue and notify interested parties?
- Who will train the SME trainers to ensure consistent messaging and content delivery?
- Who will coordinate with SME trainers and ensure their availability?
- What happens if an event must be canceled? Who will notify trainers, participants, and reschedule with the venue?
- If there is a field component (i.e., testing demonstration or related activity), who will ensure it is safely undertaken?
- Who will follow up with participants to ensure they receive official feedback about their training results, and/or provide a certificate?

5.4.2 Online Training

Online training allows geographically remote participants to learn through online technologies or delivery methods (e.g., videos, webinars, podcasts, etc.), often at their own pace and at convenient times. The benefits and necessity of this type of training opportunity has been demonstrated during the COVID-19 pandemic in ways that may not previously been imagined. Many government agencies use online learning management systems such as NeoGov™, MySuccess™, and KnowledgeCity™ to provide training opportunities to their staff.

Unlike in-person training, SMEs are used only to develop training materials, and opportunities for direct communication with participants are limited or non-existent. Online learning often provides adult learners with two types of learning interaction experiences: audible and visual. However, adults that excel through tactile and interactive learning experiences may not fully benefit from this training approach. The two applicable types of training methods afforded by basic online training programs (from **Table 5-1**) are: lecture and simulation.

Depending on the available funding to create an online training program, online training programs can range on a spectrum from basic in nature to complex and immersive. The actions associated with basic online programs (e.g., PowerPoint module with narration) such as turning pages, clicking “next” and watching videos are not considered to be interactive training activities. The interactive learning opportunities made available by immersive online programs involve real-life decision making and problem-solving, and often include animations, branching scenarios¹⁶, and digital stories¹⁷.

While many of the training issues that can be challenging for in-person training programs do not exist with online training, other considerations should be made when establishing such a program, including:

- What platform will be used to host the training program?
- Is additional infrastructure needed to support the platform?
- What type of access rights are needed and who can provide access to trainees?
- How will questions arising from an online course be handled?
- Who will provide technical support?
- Who will proctor the examination?
- How can content be updated?
- What cybersecurity measures must be taken?

This type of training approach is not new to the County, which currently makes an eLearning platform available to County employees. This platform provides online learning courses related to personal and professional development, computer and technical skills, and other topics. The County also offers numerous virtual education programs, pre-taped video lessons, tours, and workshops that can be accessed online.

It is estimated that the time to complete online training for the proposed curriculum is 8 to 12 hours. To minimize the amount of time needed to present the curriculum, the County could utilize a more basic interactive format and rely on a higher amount of video content. If necessary, the proposed content in the inspection methods and standards module could be scaled back to create a shorter training program.

¹⁶ A branching scenario is a way of placing a learner into the role of a decision-maker, allowing them to make their own choices and see how outcomes play out. It provides a safe way for learners to try out different approaches and see the consequences of their actions, preparing them for similar situations in the real world.

¹⁷ A digital story is a combination of various digital elements presented within a narrative structure, and may include text, images, video, audio, social media elements, and/or interactive elements.

5.4.3 Hybrid (In-Person and Online) Training

A hybrid training approach provides opportunities to leverage online instruction, in-person instruction and interaction, and hands-on type field exercises. Applying a hybrid approach to the sewer inspector training program may involve requiring training participants to complete prerequisite, online instruction before an in-person, field-focused training session facilitated by a SME. An example of training methods by proposed training topic is provided in **Table 5-3**.

Table 5-3. Proposed Inspector Training Module Topics

Module/Topic	Training Methods
1. Introduction to the Regional Inspection Certification Program	Online Instruction
2. Inspection Methods and Standards	Online Instruction
3. Testing Standards	Online Instruction followed by field focused training
4. Construction BMPs	Online Instruction followed by field focused training
5. Safety Issues and Customer Service	Online Instruction

For this type of training approach, issues previously identified for both in-person and online training must be considered. The administration and overall cost of this type of program could be more challenging than an “in-person only” type program due to the need to monitor online instruction, the need to monitor completion of certain modules, and scheduling field focused training venues and SMEs. However, there is a higher degree of guarantee that training participants have understood the training content when they are able to demonstrate their achieved level of KSAs with an instructor present.

5.4.4 Recommended Training Method

An online approach is initially recommended for the inspector training program. This recommendation, which is supported by members of the I/I Task Force, involves online videos and interactive learning modules. It is tailored to inspectors who are assumed to already have a base level of inspection knowledge and experience. In the future, if a private side sewer inspection program is developed and if this inspector training program is refined to support that program, then the most appropriate training method may be different.

The I/I Task Force evaluated the initial recommendation of an online training method approach. Discussions revolved around time commitments, absences from work, travel requirements, and other convenience issues. Task Force members preferred the more flexible option (online) and provided suggestions for overcoming shortcomings of not being physically present for the training. For example, videos could be incorporated into the training modules and knowledge checks could be inserted into the modules. This example would be similar to those used in other online training programs offered by Task Force member agencies. Based on this input, the proposed time allocation is 8 hours, which includes 1 hour for the online examination. Based on this input, the recommendation made by the Consultant Team was unchanged.

5.5 Possible Certification Examination Methods

Similar to the training program, there are numerous ways that the certification examination can be administered. The purpose of considering examination methods in program development rather than implementation planning is to ensure that the testing method adequately evaluates the materials presented during the training.

It should also be considered whether the examination style or styles should complement the training, for example, if training is conducted fully in-person, the examination may mirror this style for the purpose of consistency in administering and accessing the training and testing. Additionally, developing the certification examination along with the training materials may reduce the costs of development and improve the quality

of the examination if they are developed at the same time and by the same party, or by collaborating parties. The methods below will be evaluated further when developing the program Implementation Plan.

5.5.1 In-Person Examination

Offering the certification examination at the end of the in-person training sessions enables participants to answer questions on material that is fresh in their minds, especially if time is allowed for an instructor-driven course content review and for discussions.

5.5.2 Online Examination

In conjunction with an online training program, offering participants the opportunity to complete a certification examination online will allow them to refer to their notes and complete the course at a time that is convenient. It is beneficial to develop three to four times the number of questions for online examinations than those presented on examinations administered in written format. Many testing agencies will randomize the questions given online to minimize the risk of shared answers.

5.5.3 Recommended Certification Examination Administration Method

A 1-hour online approach with 30 multiple choice questions is initially recommended for the inspector certification examination.

When the certification examination issue was discussed with the I/I Task Force, most members agreed it would be beneficial to require some sort of assessment to verify the trainee acquired the necessary knowledge. Based on this input, the recommendation made by the Consultant Team was unchanged.

6.0 Roles and Responsibilities

This section describes proposed roles and responsibilities for the Inspector Training and Certification Program based on the training scope, content, and methods described in previous sections. The associated assumptions of time and cost to meet roles and responsibilities are included in **Section 7**.

The County is expected to have the following responsibilities prior to and during program implementation:

- **Program administration:** The County, or a third party acting on behalf of the County, would be responsible for a wide range of work related to hosting trainings and tracking certifications. In addition, this role would be responsible for completing implementation planning to develop training content, methods, etc. The County may also be responsible for covering the cost of program administration.
- **Implementation planning:** The County would be responsible for creating the implementation-ready training and certification content based on this TM.

Component agencies are expected to have the following responsibilities prior to and during program implementation.

- Participants to be trained are component agency inspectors, including both staff and contractors. The participants are responsible for registration, training, attendance, and certification examination. The cost of registration and/or examination fees may also be the responsibility of the participant.
- Also, prior to, or in parallel with implementation planning, each component agency would need to evaluate whether the requirement of this training triggers bargaining with their affected employee unions.

To implement a voluntary Inspector Training and Certification Program, the County expects to request commitments from component agencies to confirm funds are appropriately spent and result in intended benefits.

7.0 Program Cost Estimates

This section describes estimated program costs to complete program development and to administer and run the training and certification program. These are planning level cost estimates.

7.1 Cost Assumptions

The costs assume an immersive online training program that involves real-life decision making and problem-solving, and include animations, branching scenarios, and digital stories (see **Section 5.4.2**). Including time to complete the exam, it is anticipated that the training will take 8 hours per inspector (7 hours of training and 1 hour for the exam). A flat yearly rate of \$295,000 (2021 dollars, 1,700 hours/yr) per full-time employee (FTE) is used, regardless of role (administrative staff and inspectors), and is consistent with WTD cost assumptions for labor costs. It is assumed that WTD will need to dedicate one FTE per year (\$295,000/yr) for the day-to-day management, troubleshooting, and coordination of the program in the beginning. This level of effort is expected to be lower after the program is established and the existing inspectors are initially trained.

The online training materials will be hosted on King County's system, with no additional internet hosting/management costs required. Costs associated with this training and certification program are considered operational costs by the County.

Costs that are borne by component agencies include the time inspectors are completing the online training and administrative costs to schedule and monitor the training for the inspection staff. The number of inspectors, rates for inspectors, and rates for an administrative staff varies for each agency. For planning purposes, it is assumed that each component agency has four inspectors. It is estimated that administration of the inspector training program may take one, 8-hour day every month, thus a 0.05 FTE. Administrative duties may include review of current inspector's training status, scheduling training of new employees, verification that certified inspectors are being used on sewer construction/rehabilitation projects, and providing reporting (if required) to King County. This effort may be concentrated over a shorter time period, rather than evenly spaced throughout the year. It is not expected that this program will cause additional work for inspectors, outside of training events. Component agencies will need to calculate this cost for themselves based on their actual number of inspectors, administrative staff, and actual salaries.

7.2 Cost

Costs can generally be divided into three categories:

- Development of training materials
- WTD maintenance and management (administration) of the program
- Component agency training and management (administration) costs

7.2.1 WTD Costs

The costs for WTD consist of one-time costs and annual costs. The one-time costs involve \$200,000 for content and framework and \$370,000 for Module and test development. Online training costs can vary greatly depending upon the quality, length, and complexity of the module, with costs ranging from \$10,000 to \$50,000 per hour of online content. Using the upper end of that range and 7 hours of content, it will cost \$350,000 to develop online-ready content. It is estimated to cost about \$20,000 to develop the certification test. The annual costs would relate to WTD administration of \$295,000 using the following equation:

$$1 \text{ FTE} * (\$295,000/\text{year}) = \$295,000 \text{ per year for WTD Administration costs}$$

WTD costs for this program are summarized in **Table 7-1**.

Table 7-1. WTD Program Costs

Items	One-Time Cost	Annual Cost
Content and framework	\$200,000	–
Module and test development	\$370,000	–
WTD Administration	–	\$295,000
Total	\$570,000	\$295,000

7.2.2 Component Agency Costs

While WTD is sponsoring and funding the program, there are associated costs for participating component agencies. The costs for each component agency would depend on the number of inspectors completing 8 hours total of training, their pay rates and the annual hours and rates for administrative support. For example, if an agency had four inspectors participate in the training at County pay rates then the training cost would be \$8,330 using the following equation:

$$4 \text{ inspectors} * 8 \text{ hours} * (\$295,000/1,700) = \$8,330$$

Also if an agency assumed 0.05 of full time equivalent administrative support at County pay rates then the annual administrative cost would be \$14,750 using the following equation:

$$0.05 \text{ FTE} * (\$295,000/\text{year}) = \$14,750$$

Each component agency will need to estimate costs for their particular circumstances.

7.2.3 Cost Considerations and Implications to Effected Parties

The costs for developing, implementing, and managing the Inspector Training and Certification Program will have to be reviewed with respect to the Accountancy Act, as WTD cannot provide benefits to other local governments without receiving full and fair value; meaning that the component agencies may have to be charged in part or in whole for the training sessions to cover these initial costs. See **Section 4.1.2** for an overview of legal implications.

Outside agencies or other third-party trainees, not component agencies, will be required to pay the full price (to be established) to receive the training and certification to avoid gift of public funds issues.

Costs will need to be reviewed, updated to be agency specific, and approved by component agencies. This would occur if MWPAAC recommends proceeding with planning and supports implementing the inspector training program.

7.3 Funding

The funding for the program costs is ultimately rate driven, either by WTD rates, component agency rates, or a combination of the two. The costs could be offset to some degree by charging the full price to outside agencies or other third-party trainees.

After a MWPAAC recommendation and WTD decision is made on whether to implement the program, the program is expected to go through the County budgeting process to secure funding.

8.0 Next Steps for Implementation

This section describes the next steps to be taken to move the Inspector Training and Certification Program concept through an implementation planning phase and program launch. A decision on whether to implement the program will be made after this TM has been finalized.

8.1 Planning

Implementing the Inspector Training and Certification Program concept is expected to require significant planning efforts from WTD and the various local agencies participating in the program.

8.1.1 WTD Actions

Planning actions expected to be undertaken by WTD include:

- Coordinate with component agencies to get agreements in place and establish legal authorities for the voluntary program.
- Secure funding for implementation of the program.
- Initiate a consultant contract to complete implementation planning and to result in a ready-to-implement training and certification program.
- Implement the program.
- Explore the development of a separate Inspector-In-Training Program.

8.1.2 Local Agency Actions

Planning actions expected to be undertaken by the various local agencies include:

- Review the impact on each agency's resources and labor union agreements prior to, and in preparation for, program implementation.
- Acknowledge an interest in participation and formalize that commitment.

8.1.3 Local Agency Interest Survey

A brief interest survey was conducted via the online platform SurveyMonkey™ to assess the level of interest at a specific point in time and to support the programmatic decision-making process. Survey questions were designed to gather responses on:

- Interest in implementing an inspector training and certification program
- Barriers to participation
- Inspector pool information
- Interest in exploring an inspector-in-training program

Surveys were distributed to all MWPAAC agencies and completed by General Managers, Directors, and equivalent employees. Twenty-six responses were received from a total of 24 MWPAAC agencies. There were 19 responses in favor of participation in the training program.

Results of the survey, presented in **Appendix C**, can be summarized by the following key takeaways for the majority responses:

- The inspector training and certification program is important to regional I/I control efforts.
- There is a need for the program to support regional I/I control.
- It appeared likely that the respective respondent's agency would participate if the program were implemented.
- The respective agency inspectors expressed neutral to favorable sentiments towards the program.

The responses provided in the open comment boxes showed some reservations related to both the current need for and outcome of the proposed program.

Additionally, a majority of the respondents expressed at least some interest in exploring a separate future regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool of job applicants i.e., an inspector in-training program.

Figure 8-1 geographically illustrates the local agencies' likelihood of participating in a Regional Side Sewer Inspector Training and Certification Program.

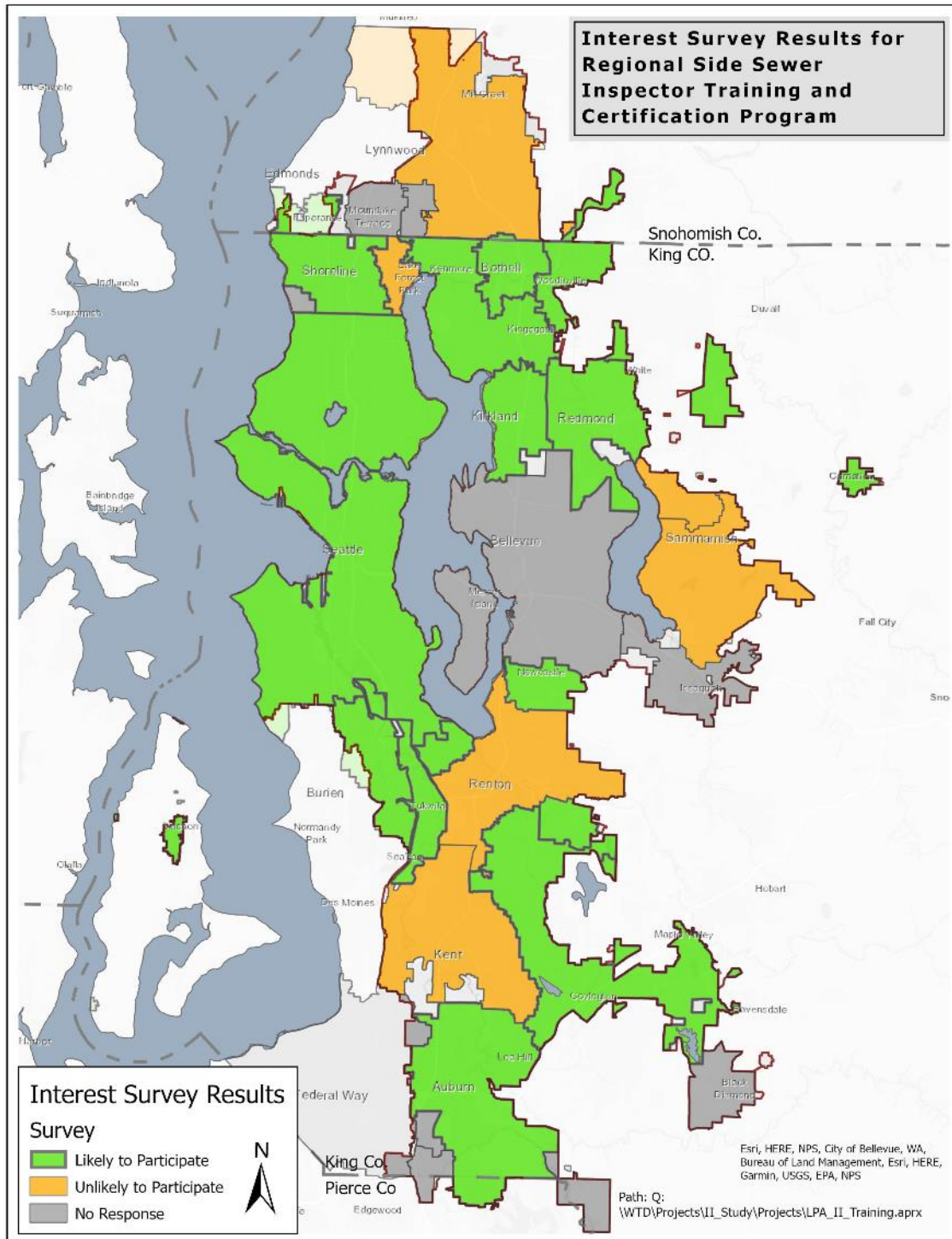


Figure 8-1. Interest Survey Results Showing Likelihood of Inspector Training and Certification Program Participation

8.2 Implementation Schedule

The specific implementation schedule is dependent on recommendations by MWPAAC, subsequent decisions by WTD, and several other factors. It is estimated that setting up an inspector training program without any constraints could take between 18–24 months. This time frame includes coordination with member agencies and other industry associations, contracting with third-party content developers, setting up training tracking software, and development of training modules.

However, this schedule could be impacted based on early decisions made regarding mandatory/voluntary participation, minimum/regional inspection standards, and other issues.

During implementation planning, a stakeholder communication plan should be developed. This plan will include how stakeholders will be identified, contacted, and kept informed; what information and at what times stakeholders will be engaged; and what method will be used to obtain feedback. Stakeholders may include:

- MWPAAC agencies
- Local entity building departments
- Side sewer inspectors–plumbers, public works inspectors, side sewer inspection companies
- Side sewer contractors
- Community at large
- Future side sewer inspector candidates
- Third parties, such as the Pacific Northwest Clean Water Association, Washington Wastewater Collection Personnel Association, and NASSCO

Appendix A: APWA CPII Examination Content Outline



**PUBLIC INFRASTRUCTURE INSPECTOR CERTIFICATION
EXAMINATION**

CONTENT OUTLINE

- I. **TESTING, MEASUREMENT, and INSPECTION: 75 items** (Recall: 28, Application: 42, Analysis: 5)
 - A. **Underground Construction: 20 items** (Recall: 8, Application: 12, Analysis: 0)
 1. Inspect and ensure compliance with plans and specifications, and best construction methods for:
 - a. utility systems.
 - b. storm sewers.
 - c. water systems.
 - d. sanitary sewers.
 2. Perform inspections on the following job site materials:
 - a. pipe.
 - b. shoring systems.
 - c. trench backfill.
 3. Conduct right-of-way permit inspections for:
 - a. utility installation.
 - b. sewer caps for demolition.
 - c. utility taps.
 - d. trench backfill.
 4. Observe and document results of the following tests on new sewer lines and manholes:
 - a. mandrel test.
 - b. air test.
 - c. vacuum test.
 - d. video inspection.
 - e. infiltration/exfiltration.
 5. Monitor hydro-static pressure testing on sewer and water lines.
 6. Obtain samples for laboratory testing of water systems for chlorine residual and bacteria.
 7. Verify ties to valves.
 8. Exercise proper safety procedures while entering confined spaces or dangerous areas.

B. At-Grade Construction: 22 items (Recall: 9, Application: 13, Analysis: 0)

1. Inspect and ensure compliance with plans and specifications, and best construction methods for:
 - a. curb and gutter construction.
 - b. paving.
 - c. sidewalk and driveway approach construction.
 - d. restoration work (e.g., fine grading, sod, or seedbed preparation work).
 - e. traffic striping.
 - f. traffic signal installations.
 - g. construction traffic control devices.
 - h. erosion and siltation control installations.
2. Perform inspections on job site materials - asphalt.
3. Conduct right-of-way permit inspections for:
 - a. driveways.
 - b. sidewalks.
 - c. curb and gutter.
 - d. alley construction.
 - e. street repair.
 - f. ADA ramps.
 - g. sign installation.
 - h. traffic control.
 - i. site development.
 - j. erosion and sediment control.
4. Inspect asphalt paving projects.
5. Inspect concrete paving projects.
6. Make minor field modifications of line and grade to:
 - a. match existing topographic features.
 - b. achieve positive drainage.
7. Verify ties to survey monuments.
8. Inspect traffic maintenance operations through construction zones.

C. Structural Construction: 8 items (Recall: 1, Application: 2, Analysis: 5)

1. Inspect and ensure compliance with plans and specifications, and best construction methods for:
 - a. bridges.
 - b. forming systems.
 - c. reinforcing steel.
 - d. reinforced concrete structures.

D. General Construction: 25 items (Recall: 10, Application: 15, Analysis: 0)

1. Inspect and ensure compliance with plans and specifications, and best construction methods for:
 - a. lines and grades.
 - b. construction materials.
 - c. construction safety precautions.
2. Perform inspections utilizing the following equipment:
 - a. survey instruments.
 - b. measuring devices.

- c. calculator.
- d. straight edge.
- e. computers and programs.
- f. safety devices.
3. Perform inspections on the following job site materials:
 - a. concrete.
 - b. soil retention systems.
 - c. aggregates.
 - d. soil.
4. Maintain inspection and testing equipment.
5. Perform mathematical calculations through geometry, algebra, and trigonometry (e.g., proportions, percentages, area circumference, volume):
 - a. percent of grade.
 - b. invert elevations.
 - c. cross slopes.
 - d. super elevations.
 - e. volume.
 - f. area.
 - g. stationing.
 - h. density.
 - i. conversions.
 - j. feet in inches vs. feet in tenths.
6. Verify that delivered materials meets mix designs.
7. Verify minimum requirements for compaction, moisture content, and stabilization quantity when accepting/rejecting soils.
8. Review geotechnical reports.

**II. PROJECT PLANNING and MANAGEMENT: 37 items (Recall: 15,
Application: 22, Analysis: 0)**

A. Planning: 13 items (Recall: 5, Application: 8, Analysis: 0)

1. Review plans and specifications.
2. Review shop drawings and submittals.
3. Verify contractor licenses and permits.
4. Estimate quantities of construction materials.
5. Disseminate right-of-way activities to various agencies.
6. Coordinate with inspection office regarding joint agency projects.
7. Inform management of variances in schedule or of any other problems.
8. Review consultant field check plans (constructability review) and specifications.
9. Participate in value-engineering sessions.
10. Participate in the evaluation of new materials and construction methods.
11. Conduct wage rate interviews with contractor's employees to ensure compliance with federal wage rates.

B. Management: 24 items (*Recall: 10, Application: 14, Analysis: 0*)

1. Review concrete placement schedule with contractor.
2. Recommend the acceptance of projects through the use of:
 - a. punch list items.
 - b. final walk-through inspections.
 - c. warranty inspections.
3. Recommend change orders.
4. Prepare change orders.
5. Negotiate change orders.
6. Compile as-built plans.
7. Review as-built plans.
8. Utilize various software programs for documentation (e.g., Access, Excel, Outlook, WORD).
9. Communicate clearly with contractors.
10. Recommend field modifications.
11. Assess current progress and adherence to schedule and duration limits.
12. Investigate and respond to contractor claims for additional payment extensions, and changed conditions.
13. Review and approve contractor's final invoices.
14. Compute monthly estimates of work completed, and approve payment for contractors.
15. Investigate and respond to citizen concerns.
16. Notify the community of construction schedule.
17. Attend inspection training seminars.
18. Adhere to professional standards of conduct.
19. Enforce ethical conduct for all employees.

III. PROJECT COMPLIANCE and DOCUMENTATION: 38 items (*Recall: 10, Application: 23, Analysis: 5*)**A. Compliance: 22 items** (*Recall: 4, Application: 13, Analysis: 5*)

1. Inspect and ensure compliance with plans and specifications, and best construction methods for ADA compliance.
2. Maintain knowledge of codes and specifications.
3. Review results from field tests.
4. Ensure compliance with documents regarding:
 - a. standards for construction.
 - b. regulatory agency permits.
 - c. quality assurance program for material sampling and testing.
5. Ensure compliance with agency contract documents regarding:
 - a. standards for construction.
 - b. regulatory agency permits.
 - c. measurement and payment.
 - d. quality assurance program for material sampling and testing.

6. Ensure compliance with OSHA regarding construction safety standards.
7. Ensure that prevention of damage to surrounding work areas and restoration of right-of-way.
8. Ensure the implementation of dust control measures.
9. Review materials testing reports.
10. Issue violation/non-compliance notices.
11. Issue stop-work orders.

B. Documentation: 16 items (*Recall: 6, Application: 10, Analysis: 0*)

1. Verify quantities of construction materials.
2. Write daily project diaries/reports covering at a minimum:
 - a. manpower.
 - b. equipment use.
 - c. type of work performed.
 - d. on-site discussions with contractor's staff.
 - e. weather.
3. Maintain a photographic record of each project.
4. Record activities on job sites by name, action, location, and performance in daily logs, and weekly summary reports.
5. Maintain a log regarding change orders.
6. Document field changes to the construction plans.
7. Record quantities of materials received or used during specified periods.
8. Maintain material testing log.
9. Maintain project information on construction materials on hand.
10. Interpret plans and specifications.
11. Verify the accuracy of dimensions of installations and layouts.
12. Prepare sketches of construction installations that deviate from plans.

Appendix B: Typical Inspector Duties List

- A. Review the Plans, Specifications, Permits, Applicable Laws, Safety Regulation, and Applicable Codes.
 - 1. Permits from Other Agencies:
 - a. Time Restrictions
 - b. Hauling Restrictions
 - c. Local, State, and Federal
 - 2. Special Provisions:
 - a. Special Phasing and Sequencing
 - b. Unusual Requirements
 - c. Time Restrictions
 - d. Hazardous Material Disposal
 - e. Soil Reports and Boring Data
 - f. Traffic Control Requirements
 - 3. Notes on the Plans:
 - a. Limits of Construction
 - b. Obstructions
 - c. Removals
 - d. References to Standard Plans
 - 4. Standard Specifications
 - 5. Reference Specifications
 - 6. Standard Plans
 - 7. Safety Regulations
 - 8. Applicable Codes
 - 9. Call Before You Dig (Washington 811)
 - 10. Traffic Control Handbook (MUTCD)
 - 11. Submittals
- B. Review the Contract and Construction Schedule.
 - 1. Notice to Proceed
 - 2. Working Days/Calendar Days
 - 3. Mobilization Time
 - 4. Schedule of Values / Payment Schedule
 - 5. Bid-Listed Subcontractors
 - 6. Liquidated Damages
- C. Review Other Information.
 - 1. Grade Sheets
 - 2. Correspondence
 - 3. Permits from Other Agencies
 - 4. Right-of-Way Limits
 - 5. Right-of-Entry Agreements
 - 6. Easements (Permanent and Temporary)
- D. Inspect the Work Site.
 - 1. Traffic Requirements:
 - a. On-Street Parking
 - b. Business Access
 - c. Residential / Pedestrian Access
 - 2. Check Lay-Down Area
 - 3. Preview Photos / Videos
 - 4. Utility Mark Outs
 - 5. Stock Pile Areas
 - 6. Assess potential inflow sources to the sanitary sewer
 - 7. Stormwater Inlets / Catch Basins
- E. Review Project with Contractor.
 - 1. Design Engineer
 - 2. Liaison with Fire, Police, Utilities, and Others
 - a. Notifications
 - b. Emergency Numbers
 - 3. Permit Requirements
 - 4. Safety
 - a. Injury and Illness Prevention Plan
 - b. Competent Person
 - c. Trench Shoring
 - d. Confined Space
 - 5. Insurance Requirements
 - 6. Project Superintendent
 - 7. Organization
 - 8. Emergency / After Hours Contacts
 - 9. Construction Schedule
 - 10. Payments
 - 11. Reports Required by Owner
 - 12. Labor Requirements
 - 13. Subcontractors
 - a. Bid Listed Subcontractors
 - b. Subcontractor Substitutions
 - c. Additional Subcontractors
 - 14. Lay-Down Area
 - 15. Traffic Requirements
 - 16. Noise Restrictions
 - 17. Work Hours
 - 18. Hazardous Materials Mitigation Plan
 - 19. Sewer Spill Mitigation Plan
 - 20. NPDES / MS4 Requirements
- F. Implement Project Controls.
 - a. Erosion Protection and Sediment Control / Stormwater Pollution Prevention Plan
 - 1. Communication
 - 2. Inspection Procedures
 - 3. Sampling and Testing
 - a. Soil Compaction Testing
 - b. Concrete Testing
 - c. Pipeline Testing (air, vacuum, water, CCTV, mandrel, etc.)
 - d. CIPP Testing
 - e. Other Testing
 - 4. Safety Notification
 - 5. Payments
- G. Maintain Records and Reports.
 - 1. Daily Record of Construction Activities
 - a. Personnel
 - b. Equipment
 - c. Work Completed
 - d. Non-Conforming Work
 - e. Conversations
 - f. Problems
 - g. Safety Incidents
 - h. Site Visits by Others
 - 2. Daily Project Status
 - a. Work Days
 - b. Rain Days
 - c. Administrative Delays
 - d. Contractor Caused Delays
 - e. Delays in Arrears
 - 3. Photos and Video Documentation

Source: *Public Works Inspectors' Manual*, BNI Building News, 6th edition, 2010.

Modified for applicability to this initiative

Appendix C: Regional Side Sewer Inspector Training and Certification Program Survey Results

#1

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 10, 2021 12:03:25 PM
Last Modified: Friday, September 10, 2021 3:23:33 PM
Time Spent: 03:20:07
IP Address: 50.47.78.138

Page 2

Q1

Please enter your name.

Stephen Dennehy

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Northshore Utility District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

Staffing capacity,

What barriers stand in the way of your agency's participation in the Program?

Other:
You need to add an answer for "NOTHING"

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

1-3 inspectors

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Strongly favor

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#2

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Sunday, September 12, 2021 7:15:06 PM
Last Modified: Sunday, September 12, 2021 7:23:40 PM
Time Spent: 00:08:33
IP Address: 50.125.233.242

Page 2

Q1

Please enter your name.

Mike Johnson

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Cross Valley Water District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

The program is extremely important

Comments:

Very important helps keep the costs down on upgrading pipes and treatment plants.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

There is significant need for the Program

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Likely

Q7

What barriers stand in the way of your agency's participation in the Program?

Budget,

Staffing capacity

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

Contracted or 3rd party inspectors,

Other (please specify):

We are talking about starting in house inspectors. Our current inspector is a retired employee.

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

One and a staff person to back-up when needed.

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Q12

Is there anything else you would like to share with us?

I think similar standards should be used at a minimum by all Utilities. Example fern-cos should be banned. They collapse or leak due to the band. We do not allow fern-cos, Also certain pipe and manhole adaptors should be required as well.

#3

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, September 13, 2021 6:32:14 AM
Last Modified: Monday, September 13, 2021 6:59:26 AM
Time Spent: 00:27:12
IP Address: 50.47.78.138

Page 2

Q1

Please enter your name.

Alan G Nelson

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Northshore Utility District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

The program is significantly important

Comments:

I am not sure if there is any evidence on whether there is significant need for the program based on unsatisfactory side sewer work. I believe combination systems are a significant issue.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

There is some need for the Program

Comments:

I am not sure if there is any evidence on whether there is significant need for the side sewer inspection program based on unsatisfactory side sewer work. I believe combination systems are a significant issue.

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Likely

Comments:

Likely - I would like to see the certification program partner with other related inspection program

Q7

What barriers stand in the way of your agency's participation in the Program?

Duplicative existing agency training,

Other:

Minor if any

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

1-3

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat favor

Q12

Is there anything else you would like to share with us?

We understand and support the inspector program. I understand it is just one tool to address the I-n-I issue. Our utility has done allot to address I-n-I over the years. I would like to see an award recognition program for utilities like ours. Perhaps credit or discount in billing to further recognize proactive utilities.

We would support a committee to develop criteria for a overall program that includes members of component agencies.

#4

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 10, 2021 11:07:36 AM
Last Modified: Monday, September 13, 2021 7:26:02 AM
Time Spent: Over a day
IP Address: 50.34.8.222

Page 2

Q1

Please enter your name.

Laura Keough

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Northeast Sammamish Sewer & Water District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is somewhat important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is some need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Unlikely**

Comments: The District will not require participation. It will be left to employees if they wish to participate.

Q7

What barriers stand in the way of your agency's participation in the Program?

Staffing capacity,

Other:

We are a small District with 7 field crew. At anytime we can have half of those employees working on the sewer system. We don't have 5 years to wait for an employee to gain experience prior to having them perform inspections so they are trained in-house. Training pre-requisites seem to be a large barrier.

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

1-3

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Comments:

Somewhat interested

This would be more beneficial than the proposed program.

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat oppose

Q12

Is there anything else you would like to share with us?

Respondent skipped this question

#5

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 10, 2021 10:48:58 AM
Last Modified: Tuesday, September 14, 2021 7:36:21 AM
Time Spent: Over a day
IP Address: 74.94.77.165

Page 2

Q1

Please enter your name.

Patrick Martin

Q2

What is your official title at your agency?

Other (please specify):
Operation Manager

Q3

Select the agency you represent.

Coal Creek Utility District

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is extremely important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

What barriers stand in the way of your agency's participation in the Program?

Budget

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

2

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#6

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, September 14, 2021 2:50:31 PM
Last Modified: Tuesday, September 14, 2021 2:55:00 PM
Time Spent: 00:04:28
IP Address: 50.228.27.122

Page 2

Q1

Please enter your name.

Gregory G. Hill

Q2

What is your official title at your agency?

Other (please specify):
Operations Manager

Q3

Select the agency you represent.

Soos Creek Water & Sewer District

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is extremely important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Highly likely**

Q7

What barriers stand in the way of your agency's participation in the Program?

**Budget,
Staffing capacity**

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

3-5

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Comments:

Our inspectors are internal staff, they are highly trained and committed to the prevention of I/I and adherence to our specifications.

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#7

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, September 16, 2021 12:43:46 PM
Last Modified: Thursday, September 16, 2021 1:02:11 PM
Time Spent: 00:18:24
IP Address: 70.89.129.145

Page 2

Q1

Please enter your name.

Mike Amburgey

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Cedar River Water & Sewer District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Highly likely**

Q7

Staffing capacity

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

2

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆ **Somewhat interested**

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆ **Neutral**

Q12

Is there anything else you would like to share with us?

Thanks to those who put forth the effort in developing the draft program.

#8

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Monday, September 13, 2021 7:44:06 AM
Last Modified: Tuesday, September 21, 2021 4:56:31 PM
Time Spent: Over a week
IP Address: 38.94.96.2

Page 2

Q1

Please enter your name.

Lisa Tobin

Q2

What is your official title at your agency?

Other (please specify):

Utilities Engineering Manager (authorized by PW Director)

Q3

Select the agency you represent.

City of Auburn

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

Comments:

The program is somewhat important

Our staff are well-trained but certification documents that fact. Helpful to get training on proper/improper examples of: installation, safety, pipe laying techniques, materials, and also legal/illegal connections

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

Comments:

There is significant need for the Program

Concern about excessive I/I coming from newly-constructed systems in portions of the regional service area. Is this poor installation and inspection (infiltration) or illegal dumping into sewer (inflow, unauthorized construction discharges)

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Likely

Q7

What barriers stand in the way of your agency's participation in the Program?

Staffing capacity,

Other:

There wasn't an "Other" box to check. No barriers - time commitment is acceptable, and benefits staff development

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

5

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Uninterested

Comments:

City inspectors are expected to oversee much more than side sewers, and receive necessary training through the City. The proposed certification program would provide all the training needed for side sewers, so an additional program has little value.

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat favor

Comments:

they would find it a useful refresher course and validation of current procedures

Q12

Is there anything else you would like to share with us?

Hope that this program and the BMPs will be developed soon to provide training coincident with continuing high rate of development

#9 replaced by #23 as requested by City

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, September 15, 2021 10:32:17 AM
Last Modified: Wednesday, September 22, 2021 10:09:26 AM
Time Spent: Over a day
IP Address: 204.152.61.20

Page 2

Q1

Please enter your name.

Dave Juarez

Q2

Public Works Director, or representative

What is your official title at your agency?

Q3

City of Redmond

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Unlikely**

Q7

Staffing capacity,

What barriers stand in the way of your agency's participation in the Program?

Other:
I and I is not a significant issue in Redmond, especially in the public sewer mains

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

3-5 inspectors

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆ **Somewhat interested**

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆ **Somewhat oppose**

Q12

Is there anything else you would like to share with us?

All new side sewers are air and water tested from the building to the sewer main. Spot repairs to side sewers are visually inspected but not air/water tested because clean outs and test Ts are not always accessible.

#10

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 10, 2021 2:59:42 PM
Last Modified: Wednesday, September 22, 2021 11:50:58 AM
Time Spent: Over a week
IP Address: 208.87.233.201

Page 2

Q1

Please enter your name.

Boyd E. Benson for Interim Public Works Director Jaclynn Brandenburg

Q2

Public Works Director, or representative

What is your official title at your agency?

Q3

City of Bothell

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

**Budget,
Staffing capacity**

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

3 to 4

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat favor

Q12

Is there anything else you would like to share with us?

Consider incentive-based or other positive approaches to encourage training (no-cost training and certification for jurisdictions) and to encourage side sewer improvements by residents (rebates, jurisdictions could waive permit fees)

#11

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, September 23, 2021 11:43:30 AM
Last Modified: Thursday, September 23, 2021 12:26:20 PM
Time Spent: 00:42:49
IP Address: 50.47.75.178

Page 2

Q1

Please enter your name.

Phil Thornlund

Q2

What is your official title at your agency?

Other (please specify):
Construction Manager

Q3

Select the agency you represent.

Alderwood Water & Wastewater District

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

Comments:

The program is somewhat important

For agencies that have no side sewer inspector training it would be helpful.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

Comments:

There is some need for the Program

Our side sewers are all tested as part of the inspection process and most of our sewer system has been installed in the last 20 to 30 years with materials that aren't as susceptible to infiltration like the older clay or concrete main.

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Unlikely**
Comments: See answer 10

Q7 **Duplicative existing agency training**

What barriers stand in the way of your agency's participation in the Program?

Q8 **In-house staff inspectors**

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9
How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

We have one primary side sewer inspector but the other 7 construction inspectors have the training and capabilities to fill that roll.

Q10
What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆ **Uninterested**
Comments: We're confident that we have the training and a deep enough pool of experience to properly inspect side sewers without the proposed training.

Q11
How would you describe the sentiment of your inspectors towards the potential Program?

☆ **Strongly oppose**
Comments: They feel that any training beyond what they've already received would be redundant.

Q12

Is there anything else you would like to share with us?

The program doesn't address what happens with the side sewer after it's been successfully inspected and approved. They're typically on private property so any illegal connections to foundation drains, downspout drains or sump pumps after the initial inspection are difficult to police. Maybe more public awareness as to the issues with I n I and what kind of monetary fines can be imposed if a homeowner is non-compliant.

#12

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, September 29, 2021 7:20:23 AM
Last Modified: Wednesday, September 29, 2021 7:24:22 AM
Time Spent: 00:03:58
IP Address: 173.160.213.145

Page 2

Q1

Please enter your name.

Dave Barnes

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Olympic View Water and Sewer District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

Staffing capacity

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

It rotates between staff as availability dictates.

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆ **Somewhat interested**

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆ **Neutral**

Q12 **Respondent skipped this question**

Is there anything else you would like to share with us?

#13

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, September 29, 2021 2:01:48 PM
Last Modified: Wednesday, September 29, 2021 2:20:34 PM
Time Spent: 00:18:45
IP Address: 74.92.228.25

Page 2

Q1

Please enter your name.

Andrew LaRue

Q2 General Manager, or representative

What is your official title at your agency?

Q3 Valley View Sewer District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ The program is significantly important

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ There is significant need for the Program

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ Highly likely

Q7

What barriers stand in the way of your agency's participation in the Program?

Staffing capacity,

Other:

None. If I had to pick something, it would be scheduling a training day(s) that works for multiple people/agencies is always difficult.

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

Two inspectors.

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Extremely interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Strongly favor

Q12

Is there anything else you would like to share with us?

Our team has a very positive view on training opportunities and attends sessions whenever possible. This would also create a networking opportunities for inspectors in the region. Standardized trainings provide value. So does having shared goals and buy-in towards a worthy cause (I&I reduction).

#14

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, September 30, 2021 5:42:31 AM
Last Modified: Thursday, September 30, 2021 6:19:04 AM
Time Spent: 00:36:33
IP Address: 216.190.24.4

Page 2

Q1

Please enter your name.

Bryan Still

Q2

What is your official title at your agency?

Other (please specify):
Operations Manager

Q3

Select the agency you represent.

City of Tukwila

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

Comments:

The program is extremely important

The program is extremely important but the question is should King County take the lead on providing the training or is there already organizations providing this type of training on a larger scale.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

Comments:

There is a critical need for the Program

The need for I/I program is high but does this type of program already exist on a larger scale.

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Highly likely**

Comments:

Highly likely depending on cost. If it's scaled to just agencies in King County it would be cost prohibitive.

Q7

Budget

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

2 inspectors

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆ **Uninterested**

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆ **Neutral**

Q12

Is there anything else you would like to share with us?

Does this sort of program already exist on a national or state level? Seems cost would be a high hurdle to overcome.

#15

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, September 30, 2021 3:57:31 PM
Last Modified: Thursday, September 30, 2021 4:13:16 PM
Time Spent: 00:15:44
IP Address: 156.74.250.9

Page 2

Q1

Please enter your name.

Andrew Lee

Q2

What is your official title at your agency?

Other (please specify):
Deputy Director

Q3

Select the agency you represent.

City of Seattle

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Comments: Awaiting further info from the county

Q7

What barriers stand in the way of your agency's participation in the Program?

Labor unions,

Duplicative existing agency training,

Other:

Organizational change

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

10 inspectors designated to do side sewer inspection, but 25-30 resident engineers in construction management and sewer inspectors in source control who inspect side sewers and would also benefit from the training and certification.

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat favor

Q12

Is there anything else you would like to share with us?

Staff are forwarding other comments to the county, here are a few high level thoughts:

Labor/bargaining unit negotiations concerns remain.

Minimum quals to take the training may need to be low enough to be broadly available to all while providing for plans-reading competency.

Assumption is the whole program remains with no cost to the member agencies.

#16

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 10, 2021 10:59:11 AM
Last Modified: Thursday, September 30, 2021 7:12:17 PM
Time Spent: Over a week
IP Address: 50.251.250.117

Page 2

Q1

Please enter your name.

Cynthia Lamothe

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Skyway Water and Sewer District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

The program is somewhat important

Comments:

Elimination of I/I is important and uniform inspection standards certainly make sense, however a training & certification program itself will not correct the I/I issue.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

There is some need for the Program

Comments:

Regional I/I control & reduction will primarily be accomplished by main & side sewer replacement, not significantly or directly by a Training & Certification Program. However, uniform standards are always desirable.

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Likely

Q7

What barriers stand in the way of your agency's participation in the Program?

Budget,

Staffing capacity,

Other:

Cost & time for staff to participate in a program is always a consideration.

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

5 inspectors

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Comments:

If a Regional side sewer Replacement program was implemented, a regional training program could augment the overall inspector pool. A regional training program could also be a pipeline for work force development into what is often a hidden industry.

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Comments:

Some concern that regional-based training could lead to standardizations not applicable to or efficient for all component agencies

Q12

Is there anything else you would like to share with us?

>I/I is a significant issue and we support a prioritized approach to addressing it, including the elimination of combined sanitary/storm systems.

>Equivalent, or better, certifications such as APWA and NASSCO in lieu of the Regional certification should be allowed/acceptable.

>Consider metering district/city sewage discharge into the regional system and charge for treatment based on actual volume.

#17

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, October 01, 2021 6:58:03 AM
Last Modified: Friday, October 01, 2021 6:59:39 AM
Time Spent: 00:01:35
IP Address: 146.129.251.56

Page 2

Q1

Please enter your name.

Joe Stowell

Q2

What is your official title at your agency?

Other (please specify):
Wastewater Utility Manager

Q3

Select the agency you represent.

City of Renton

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is somewhat important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is very little need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Highly unlikely**

Q7

What barriers stand in the way of your agency's participation in the Program?

**Budget,
Duplicative existing agency training**

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

6 inspectors

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Uninterested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#18

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, September 10, 2021 11:04:37 AM
Last Modified: Tuesday, October 12, 2021 12:32:07 PM
Time Spent: Over a month
IP Address: 209.210.62.4

Page 2

Q1

Please enter your name.

Jay Krauss

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Sammamish Plateau Water & Sewer District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

Comments:

The program is not at all important

Regional I&I needs to be addressed from a holistic approach which includes I&I abatement in public agency sewer infrastructure and mandated abatement, or flow based charges to agencies who do not effectively invest in system renewal or I&I abatement.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

Comments:

There is very little need for the Program

WTD staff has been unable to report on how the proposed program will be measured. An incremental approach to I&I without a basis of validating private side sewers are the primary source or measuring effectiveness lacks perspective.

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Highly unlikely**

Comments:

We are currently focused on I&I abatement using verifiable methods such as smoke testing and flow monitoring.

Q7

What barriers stand in the way of your agency's participation in the Program?

Duplicative existing agency training,

Other:

We do not believe this is a comprehensive approach to I&I abatement. King County possesses flow monitoring data and should use this as the basis for targeted I&I abatement initiatives.

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

3

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆ **Uninterested**

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆ **Strongly oppose**

Comments:

We do not view this as a matter for staff engagement.

Q12

Is there anything else you would like to share with us?

Although I&I abatement should be emphasized and required universally as a matter of contract terms with those local agencies participating in the regional system, not all local agencies exercise the same level of stewardship. The lack of local agency I&I initiatives results in a shifting of cost incidence from local agencies to the regional system. Local agencies should be required to exercise an accountable level of stewardship and reinvestment in the local collection systems, or be charged by the county on a flow basis. The proposed side sewer inspector training program is based upon assumptions that inspector training will result in I&I reduction through inspections. The proposal lacks evidence and metrics from the regional system to support that assertion, and has not included enforcement/abatement standards if side sewers are found to be a source of I&I. The regional program should be holistic in approach, focusing on all sources of I&I from public sewers and private side sewers. The contract agencies should demonstrate their commitment to all I&I abatement by reinvesting in their sewage collection systems prior to assuming an inspection program is the panacea.

#19

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, October 28, 2021 12:30:01 PM
Last Modified: Thursday, October 28, 2021 12:35:56 PM
Time Spent: 00:05:55
IP Address: 73.19.73.170

Page 2

Q1

Please enter your name.

Randy Witt

Q2

Public Works Director, or representative

What is your official title at your agency?

Q3

City of Shoreline, Public Works

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

What barriers stand in the way of your agency's participation in the Program?

Staffing capacity,

Labor unions,

Other:

These are not high barriers that would keep Shoreline from participating

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors,

Other (please specify):

Sewer work supporting development uses in-house inspectors, on city capital projects it may be either in-house or contracted inspectors.

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

3 who inspect sewer and other PW right of way work

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat favor

Q12

Is there anything else you would like to share with us?

Respondent skipped this question

#20

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, November 02, 2021 12:44:15 PM
Last Modified: Tuesday, November 02, 2021 1:17:03 PM
Time Spent: 00:32:48
IP Address: 146.129.252.126

Page 2

Q1

Please enter your name.

Eric Connor

Q2

What is your official title at your agency?

Other (please specify):
Construction Engineering Manager

Q3

Select the agency you represent.

City of Kent

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is some need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Unlikely**

Q7

What barriers stand in the way of your agency's participation in the Program?

**Budget,
Staffing capacity**

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

8

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#21

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Tuesday, November 02, 2021 1:45:10 PM
Last Modified: Tuesday, November 02, 2021 1:50:51 PM
Time Spent: 00:05:41
IP Address: 50.35.31.226

Page 2

Q1

Please enter your name.

Patrick F Sorensen

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Woodinville Water District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is significantly important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

Staffing capacity

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

1 inhouse and a contractor as needed.

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Neutral

Comments:

I really don't know yet. This individual very busy already.

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#22

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, November 03, 2021 5:48:39 AM
Last Modified: Wednesday, November 03, 2021 5:51:32 AM
Time Spent: 00:02:52
IP Address: 146.129.245.194

Page 2

Q1

Please enter your name.

Bill Ferry

Q2

Public Works Director, or representative

What is your official title at your agency?

Q3

City of Carnation

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is extremely important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is significant need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

**Budget,
Staffing capacity**

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

2

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Significantly interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Strongly favor

Q12

Respondent skipped this question

Is there anything else you would like to share with us?

#23

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Wednesday, November 03, 2021 1:35:50 PM
Last Modified: Wednesday, November 03, 2021 1:42:24 PM
Time Spent: 00:06:33
IP Address: 204.152.61.20

Page 2

Q1

Please enter your name.

Dave Juarez

Q2

Public Works Director, or representative

What is your official title at your agency?

Q3

City of Redmond

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

The program is significantly important

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

There is significant need for the Program

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Likely

Comments:

Existing in-house training is meeting this need.

Q7

Duplicative existing agency training

What barriers stand in the way of your agency's participation in the Program?

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

3-5

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Comments:

enhancing the applicant pool for new inspector hires is a good thing

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat oppose

Comments:

inspectors feel they already have the training they need. Inspectors are overloaded with work and the idea of additional training is a burden

Q12

Is there anything else you would like to share with us?

A successful program will include the following:

- Allow cities with in-house training programs to self-certify inspectors.
 - County funds training program.
 - Development of inspection requirements remains the responsibility of the local agency.
-

#24

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Thursday, November 04, 2021 9:06:59 AM
Last Modified: Thursday, November 04, 2021 9:17:32 AM
Time Spent: 00:10:33
IP Address: 76.191.73.2

Page 2

Q1

Please enter your name.

Josh Pantzke

Q2

Public Works Director, or representative

What is your official title at your agency?

Q3

City of Kirkland

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

The program is significantly important

Comments:

Inspector training will be a useful component in the effort to reduce I/I but maybe not the most important.

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

There is significant need for the Program

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Highly likely

Q7

What barriers stand in the way of your agency's participation in the Program?

Budget,

Staffing capacity

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

In-house staff inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

8 inspectors

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat favor

Q12

Is there anything else you would like to share with us?

Thanks for reopening the survey.

#25

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, November 05, 2021 2:24:04 PM
Last Modified: Friday, November 05, 2021 2:28:12 PM
Time Spent: 00:04:08
IP Address: 50.225.203.58

Page 2

Q1

Please enter your name.

James Gross

Q2

General Manager, or representative

What is your official title at your agency?

Q3

Vashon Sewer District

Select the agency you represent.

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆ **The program is somewhat important**

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆ **There is some need for the Program**

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆ **Likely**

Q7

What barriers stand in the way of your agency's participation in the Program?

Budget,

Staffing capacity,

Other:

Our maintenance person is not a District employee and is under a lump sum contract. He may not want to do the training on his own time or without special compensation.

Q8

How would you classify the inspectors you employ or use for side sewer inspection work?

Contracted or 3rd party inspectors

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

1

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat oppose

Q12

Is there anything else you would like to share with us?

Respondent skipped this question

#26

COMPLETE

Collector: Web Link 1 (Web Link)
Started: Friday, November 05, 2021 4:10:26 PM
Last Modified: Friday, November 05, 2021 4:12:07 PM
Time Spent: 00:01:40
IP Address: 146.129.245.130

Page 2

Q1

Please enter your name.

Neil Jensen

Q2

What is your official title at your agency?

Other (please specify):

City Engineer

Q3

Select the agency you represent.

City of Lake Forest Park

Q4

What is your agency's opinion on the importance of the Program to regional I/I control?

☆

The program is somewhat important

Q5

What is your agency's opinion on the need of the Program to regional I/I control?

☆

There is some need for the Program

Q6

What is the probability that your agency will participate in the Program if it is implemented?

☆

Highly unlikely

Q7

What barriers stand in the way of your agency's participation in the Program?

Budget,

Staffing capacity

Q8

In-house staff inspectors

How would you classify the inspectors you employ or use for side sewer inspection work?

Q9

How many inspectors do you employ or use for side sewer inspection work? Please provide a number or a range (8 inspectors, 5-10 inspectors, etc.).

1

Q10

What is your agency's interest in exploring in the future an additional regional program to train and prepare individuals to become side sewer inspectors and develop the inspector pool i.e. inspector in-training program?

☆

Somewhat interested

Q11

How would you describe the sentiment of your inspectors towards the potential Program?

☆

Somewhat oppose

Q12

Respondent skipped this question

Is there anything else you would like to share with us?
