



King County

Department of Natural Resources and Parks

Wastewater Treatment Division

Evaluation of Inflow and Infiltration Reduction Concepts

Potential I/I Program

Frameworks and Evaluation Criteria Briefing

For MWPAAC Review and Discussion

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Frameworks and Evaluation Criteria Briefing

The purpose of this briefing is to facilitate discussion with the MWPAAC Engineering and Planning (E&P) Committee on a proposed layout of one inflow and infiltration (I/I) program. The following have been developed for the discussion:

- A list of potential I/I program options
- A draft framework for potential regional private side sewer program
- Draft evaluation criteria for qualitative assessment of the program
- A test case of applying the evaluation criteria to the draft framework

The goal of the discussion is to gain consensus on the potential program framework content and level of detail as well as the evaluation criteria. With the input received additional frameworks for alternative programs will be developed and rated using the evaluation criteria. The results will be used for discussion around what, if any, programs the region would seek to implement.

List of Framework Options for Consideration

Table 1 is the list of framework options for implementation that have been developing during this I/I study. They include the approach to side sewer standards options developed as part of Task 400, the regional inspection training options developed as part of Task 500 and the private side sewer programs defined in Task 600. In reviewing the framework options, please consider the following:

- Does the E&P want to consider all the options listed?
- Are there other options to be included?
- Should options be removed from consideration?

Draft Framework for Private Side Sewer Point of Sale Program

Table 2 in this briefing package provides the draft framework for the private side sewer point of sale (POS) program, which is a POS program developed in conjunction with a grant/loan program. This is one option for a private side sewer POS program. Other options could be developed. For example, an option could be developed without a complementary grant program. The categories are based on the considerations listed in the I/I study scope of work. The framework is built on assumptions to allow the comparison of options for implementation as this evaluation continues. In reviewing this framework, please consider the following:

- Is the description of the program adequate?
- Is the level of detail of the assumption and features enough to aid in the comparison process?
- Are there other categories for consideration that you would like to see?

Draft Evaluation Criteria

Table 3 in this briefing package provides suggested evaluation criteria for comparing the I/I study framework options for implementation. The evaluation criteria has been developed based on feedback from the E&P through the previous project briefings and is purposefully qualitative. The scoring criteria includes a description of the measurement of the criteria and the rating definition. In reviewing the criteria, please consider the following:

- Are the measurement and rating definitions in sufficient detail for assessing I/I program options?

- Are there additional criteria that should be included for consideration?

Test Case of Applying Draft Evaluation Criteria to Private Side Sewer Point of Sale Program

Table 4 is the draft scoring developed for the private side sewer POS program with the grant and loan program. In reviewing the draft scoring, please consider the following:

- Are the rationales in column 3 in enough detail to support the rating?
- Do you agree with the draft ratings?

Table 1. Framework Options for Consideration

Implementation Options	Framework	Short Description
Approach to Common Side Sewer Standards		
Option 1	Regional best management practices (BMPs) resource	<ul style="list-style-type: none"> Consolidate the best in class BMPs identified during the site interviews and post on the County website as a regional resource.
Option 2	Focused standardization of regional BMPs	<ul style="list-style-type: none"> Identify 3 to 5 BMPs that all agencies would agree should be standard across the region. Document BMPs on the regional website. Agencies would voluntarily implement BMPs.
Option 3	Develop scalable BMP program for individual agency implementation	<ul style="list-style-type: none"> Develop full list of best in class BMPs, perform gap analysis at individual agencies, and develop plans for BMP adoption and implementation at each agency.
Standard Regional Inspection Training		
Option 1	Develop regional inspection training modules	<ul style="list-style-type: none"> Develop Inspector Training modules consisting of slides and handout materials posted on the County website as a regional resource. Use of materials would be voluntary.
Option 2	Develop voluntary regional inspection training program	<ul style="list-style-type: none"> In addition to Training Option 1, develop videos and hands-on training materials. Conduct a live training session within the region. Attendance would be voluntary.
Option 3	Develop regional inspection training program with certification	<ul style="list-style-type: none"> In addition to Training Option 2, provide a certification for attendees; conduct training annually at various locations, consider coordinating with an outside organization to implement the program.
Regional I/I Support		
Option 1	I/I resource sharing between agencies	<ul style="list-style-type: none"> Agencies develop an informal program to share rainfall simulation toolkits, smoke testing kits, flow monitors, and rain gauges. This could also include sharing personnel and equipment to perform services such as manhole inspection, CCTV inspection, and other inspections.
Option 2	County provided I/I resources	<ul style="list-style-type: none"> County to act as a regional resource providing rainfall simulation toolkits, smoke testing kits, flow monitors, and rain gauges.
Option 3	County provided I/I resources and vendors	<ul style="list-style-type: none"> In addition to Regional I/I Support Option 2, the County would administer preferred vendor contracts to assist agencies in performing services such as manhole inspection, CCTV inspection, and other inspections.
Regional Side Sewer General Inspection Program		
Option 1	Inspection program mandated by the component agencies with a Grant/Loan program	<ul style="list-style-type: none"> The program would be administered by the component agencies. Component agencies would require all properties to be inspected within a certain time frame, such as 10 years. The actual testing (exfiltration) and inspection (internal CCTV) would be completed by a contractor hired by the property owner in the presence of the inspector. Certifications would be provided to inspected properties that would be valid for a specified time such as 20 years.
Option 2	Inspection program mandated by the component agencies without a Grant/Loan program	<ul style="list-style-type: none"> Same as General Inspection Option 1, but without a Grant/Loan program to offset community costs
Point of Sale Side Sewer Inspection		
Option 1	Inspection program triggered by transfer of property with a Grant/Loan program	<ul style="list-style-type: none"> Side sewer inspection would include an exfiltration test and internal inspection completed by the property owner's contractor in presence of inspector The program would be overseen by the component agencies. Certifications would be provided to inspected properties that would be valid for a specified time such as 20 years.
Option 2	Inspection program triggered by transfer of property without a Grant/Loan program	<ul style="list-style-type: none"> Same as General Inspection Option 1, but without a Grant/Loan program to offset community costs

Table 1. Framework Options for Consideration

Implementation Options	Framework	Short Description
Grant/Loan Program		
Option 1	Develop a Grant/Loan program in conjunction with inspection programs	<ul style="list-style-type: none"> • This grant and loan program would mainly help successfully implement other side sewer programs such as the general inspection and point of sale programs. • A grant or loan program would help manage ESJ concerns. It is assumed that a grant or loan program would be administered regionally by WTD in conjunction with a private side sewer and point of sale inspection program.
Option 2	Develop a Grant/Loan program independent without implementing a regional inspection program	<ul style="list-style-type: none"> • This grant and loan program would be administered regionally by WTD and would be available for property owners to use to voluntarily inspect, replace, and/or repair their private side sewers.

Table 2. Regional Private Side Sewer Point of Sale Inspection Program Framework

Framework Categories	Program Assumptions and Features
Description	<ul style="list-style-type: none"> Side sewers would be inspected prior to the transfer of property and defective side sewers are required to be repaired. Side sewer inspection would include an exfiltration test and internal inspection completed by the property owner's contractor in presence of utility inspector. The program would be overseen by the component agencies. Certifications would be provided to inspected properties that would be valid for a specified time such as 20 years.
Case Studies	<ul style="list-style-type: none"> Communities currently performing point of sale programs are primarily in California and Minnesota and are prescribed via ordinance. The largest case study for point of sale is with East Bay Municipal Utility District (EBMUD). Long-term results for these programs are not yet available.
Program Benefits	<ul style="list-style-type: none"> Side sewers are systematically inspected and repaired as properties are transferred. Assuming an annual 5% transfer rate, most side sewers within the service area could be inspected within a 20 to 25-year period. Eliminating or reducing I/I from the largest source-private side sewers.
Program Risks/ Constraints	<ul style="list-style-type: none"> Depending on the general condition of side sewers in certain areas, the property transfer process could be slowed if side sewers are in poor shape. Program would have to confirm plumber/sewer utility contractor capacity to handle the workload. Requires a willingness and level of acceptance from realty industry. Economic/social justice issues may arise if the condition of side sewers in certain areas create a hardship on buyers/sellers and preclude property sales.
Legal Authorities Required	<ul style="list-style-type: none"> Sewer ordinances would need to be revised and development standards and building codes may need to be changed. Real estate practices and regulations would need to be revised. State-level action is not anticipated for program development.
Procedures Required	<ul style="list-style-type: none"> Regional inspection standards, including enforcement and penalty procedures Standard for repair triggers (type of defect, repair required, responsible party) Community outreach for inspection program Real estate procedures to include side sewer inspections Sewer contractor responsibilities Real estate industry responsibilities Component agency responsibilities Property owner responsibilities
Program Costs	<ul style="list-style-type: none"> No additional equipment is required as contractors will perform testing. Most agencies would likely require additional staffing for inspections and program administration. No additional WTD staff are expected to be needed.
Incentives	<ul style="list-style-type: none"> The incentive for the local agencies would be potential long-term I/I reduction to delay or reduce size of capacity improvements. Property owners would be motivated through the ordinance requiring inspection in order to transfer property. Financial support would be available to property owners by developing the program in conjunction with the Grant/Loan Program.
Penalties	<ul style="list-style-type: none"> No direct penalties are assumed for the local agencies in developing this program. The inability to transfer property would be a potential property owner penalty if there is a sewer defect without some level of repair.
Required Partners	<ul style="list-style-type: none"> Local agencies are assumed to be administrating the inspection program. Program partners would include WTD, the real estate industry, sewer contractors, and property owners.
Potential Funding Sources	<ul style="list-style-type: none"> Additional rates may be required for local agency administration. Most funding would be private through real estate transactions with property buyers/sellers.
Method for Assessing Effectiveness	<ul style="list-style-type: none"> Ongoing WTD long-term flow monitoring program and conveyance system capacity planning would ultimately inform effectiveness. Based on the program strategy of long term private side sewer replacement it will take 20+ years to confirm results.

Table 3. Program Evaluation Criteria			
Key Considerations/Criteria		Measure	Rating
Criteria 1: Effectiveness			
Potential Effectiveness	The program's long-term effectiveness (20+ year time frame) in reducing I/I	<ul style="list-style-type: none">• Case studies can indicate potential effectiveness; however, every geography and age and construction of individual side sewers are different. Therefore, an apples-to-apples comparison cannot be performed. In addition, few case studies have significant measured data to date.• To measure program effectiveness in King County, pre- and post-program flow monitoring would need to be performed over a period of decades.• The measure of effectiveness is put at a 20+ year timeframe, as prior experience has shown that a fair amount of penetration would be needed in any area to start seeing improvements.	Potential for little to no I/I reduction expected
			Potential for some I/I reduction expected that may be low and over time
			Potential to significantly reduce I/I in the Region over time
Criteria 2: Legal Implications			
Legal Implications	Complexity of the legal implications such as new ordinances, private property access, and differences between Cities and Districts	<ul style="list-style-type: none">• Legal implications would be different for each agency. For the purposes of this comparison, general assumptions for the type of program were developed and the overall legal implications were based on those assumptions.	High: Requires enacting new or amended ordinances at all Cities and Districts
			Medium: Requires new or amended agreements between King County and Cities/Districts
			Low: No ordinances or agreements are required
Criteria 3: Property Owner Impacts			
General Impact	Additional actions and responsibilities placed on property owners	<ul style="list-style-type: none">• This consideration was measured based on the action required, if any, by the property owner.	High: Property owner is responsible for actions for the program to be successful
			Medium: Component Agency is responsible for actions and property owner needs to coordinate activities
			Low: No action required by property owner
Affordability	Financial impacts to property owners	<ul style="list-style-type: none">• Initially whether or not the program has a direct financial impact on property owners was considered.• If there is an assumed cost to property owners the impact was considered.• The cost of side sewer improvements would vary based on age and construction of property. Inspections were assumed to be affordable.	High: Property owner required to pay for inspection and repairs
			Medium: Property owner required to pay for inspection only
			Low: No financial burden expected for property owners

Table 3. Program Evaluation Criteria

Key Considerations/Criteria		Measure	Rating
Criteria 4: Local Agency Impacts			
Program Development	Ease and/or complication in developing the program considering staffing, processes, and differences between Cities and Districts	• The impact of developing the program would be different for each agency due to size and organization (e.g., City versus District and small versus large entity). For the purposes of this comparison, general assumptions were made for the how the program would impact the agencies on a regional basis.	High: Program development would require additional staffing and/or new equipment and new processes would need to be established
			Medium: Most staffing and equipment are available and only new processes would need to be developed
			Low: No additional staffing, equipment, and processes are required
Program Implementation	Ease and/or complication in implementing the program considering staffing, processes, and differences between Cities and Districts	• The impact of program implementation would be different for each agency due to size and organization (e.g., City versus District and small versus large entity). For purposes of this comparison, general assumptions were made for the how the program would impact the agencies on a regional basis.	High: Program implementation requires new staff and new interactions between component agencies and WTD’s involvement would be required
			Medium: Most staffing is available and interactions between component agencies and WTD would be increased but minimal
			Low: Program can be implemented with no changes in staffing and no additional interactions between component agencies and WTD
Criteria 5: WTD Impacts			
Program Development	Ease and/or complication in developing the program considering staffing and processes for WTD	• The impact of program development for WTD.	High: Program development would require additional staffing and new processes would need to be established
			Medium: Most staffing is available and only new processes would need to be developed
			Low: No additional staffing or processes are required
Program Implementation	Ease and/or complication in implementing the program considering staffing and processes for WTD	• The impact of program implementation for WTD.	High: Program implementation requires new staff staffing and new interactions with component agencies
			Medium: Most staffing is available and interactions between component agencies and WTD would be increased but minimal
			Low: Program can be implemented with no changes in staffing and no additional interactions with component agencies
Criteria 6: Equity and Social Justice			
Equity and Social Justice	Ability for the program to be managed and adapted to be implemented equitably within the Region	• Equitable distribution of problem I/I areas in the region is not guaranteed. For the purposes of this comparison, King County’s 13 equity determinants were reviewed, and health and human services and housing were considered the primary ESJ considerations.	High: Program would add additional burden to potential or current property owners and/or renters
			Medium: Program could be adapted to alleviate burden on ESJ communities
			Low: Adds no additional burden to potential or current property owners and/or renters

Table 4. Point of Sale Side Sewer Inspection Program Rating

Key Considerations/Criteria		Rationale for Ratings	Rating (High, Medium, Low)
Criteria 1: Effectiveness			
Potential Effectiveness	The program's long-term effectiveness (20+ year time frame) in reducing I/I	<ul style="list-style-type: none"> Side sewers would be inspected prior to property transfer and repairs to defective side sewers. Assuming an annual 5% transfer rate, most side sewers within the service area could be inspected and repaired within a 20–25-year period. The largest case study for point of sale is with East Bay Municipal Utility District (EBMUD). South Fayette, Pennsylvania also has a point of sale lateral inspection program. Long-term results for these programs are not yet available. 	<ul style="list-style-type: none"> Potential to significantly reduce I/I in the Region over time. A long-term (20+ year) flow monitoring program would need to be implemented to confirm results.
Criteria 2: Program Development and Implementation			
Legal Implications	Complexity of the legal implications such as new ordinances, private property access, and differences between Cities and Districts	Sewer ordinances would need to be revised and development standards and building codes may need to be changed. Real estate practices and regulation would need to be revised.	High
Criteria 3: Property Owner Impacts			
Property Owner General Impact	Additional actions and responsibilities placed on the property owners	Property owners would be required to inspect side sewers when transferring property. Real estate and sewer contractors would need to be involved in side sewer inspection practices.	High
Property Owner Affordability	Financial impacts to property owners	Inspections could lead to unanticipated repairs for property owners. Affordability would depend on the socio-economic demographic.	High
Criteria 4: Local Agency Impacts			
Program Development	Ease and/or complication in developing the program considering staffing, processes, and differences between Cities and Districts	<ul style="list-style-type: none"> Program development would require input from the real estate industry, sewer inspectors, contractors, and all component agencies. Significant public outreach would be required to address concerns of property owners, real estate agencies, closing companies, and service providers. Agencies would need to implement new procedures to administer the program. 	High
Program Implementation	Ease and/or complication in implementing the program considering staffing, processes, and differences between Cities and Districts.	<ul style="list-style-type: none"> Implementation of program would require regional coordination of WTD, component agencies, property owners, real estate agencies, closing companies, and service providers. Additional FTEs are expected to be required at most component agencies. 	High
Criteria 5: WTD Impacts			
Program Development	Ease and/or complication in developing the program considering staffing and processes for WTD	<ul style="list-style-type: none"> The program, if overseen by the agencies, would require some but not significant administrative oversight from WTD. WTD would need to be active in the program's community outreach. 	Medium

Program Implementation	Ease and/or complication in implementing the program considering staffing and processes for WTD	<ul style="list-style-type: none">• No additional staff expected at WTD to implement the point of sale inspection program.	Low
Criteria 6: Equity and Social Justice			
Equity and Social Justice	Ability for the program to be managed and adapted for equitable implementation within the Region	<ul style="list-style-type: none">• Socio-economic impacts could be high. Adapting to address ESJ concerns would be difficult as all property transfers would be required to perform the inspection.	High