



OBJECTIVE

Remove storm water sources from the sanitary sewer system, keep wastewater and sewer rates low, and protect the environment

WHAT IS I/I?

The term I/I is an abbreviation for **Inflow/Infiltration** and is used to describe the sources of storm water (rain and groundwater) that enter into the dedicated sanitary sewer system. Sanitary sewers are pipes located under the street, or City right-of-way, and are strictly designed to transport wastewater from sanitary plumbing fixtures such as toilets, sinks, bathtubs, showers, and lavatories. **Inflow** sources are those that flow directly into the sanitary sewer via a defined route (pipe, etc.) **Infiltration** sources are those that inadvertently enter into the sanitary sewer via cracks, holes, faulty connections, or other openings.

COMMON SOURCES OF I/I

- **Inflow** sources include storm water discharge flow from sump pump connections, roof downspouts, yard and driveway drains, broken/missing sanitary cleanout caps, leaky manhole lids, and storm sewer cross connections
- **Infiltration** sources include storm and groundwater flow from broken lateral sewers, faulty lateral connections, tree root penetration, broken cleanouts, cracked sanitary pipes, faulty pipe joints, and deteriorated manholes
- Sources of I/I that consist of a direct discharge of storm water to the sanitary sewer are deemed illegal by the Codified Ordinances of the City of Oregon, specifically **OMC 925.26 PROHIBITION OF UNPOLLUTED WATER** (See Definitions section)

REASONS TO REMOVE I/I FROM THE SANITARY SEWER SYSTEM

- Excessive I/I results in **sanitary sewer backups** into basements of homes and businesses
- Untreated WWTP discharges and sanitary sewer overflows (SSOs) are **water quality violations** and will result in fines by the OEPA
- The City has been mandated by the OEPA to reduce I/I through a sanitary Management, Operation, and Maintenance program.
- The City of Oregon WWTP is a public (non-profit) utility, which is financed through a combination of user fees and income taxes used to supplement major capital improvements. A future expansion to the WWTP will be mandated by the OEPA to eliminate all overflows. The size of the plant expansion will be dependent upon the success of this program, thus a **smaller expansion equals less cost to taxpayers and wastewater users**

COMPLETED AND ONGOING PROJECTS

- The City has been working for over three years to reduce I/I impacts within the right-of-way:
 - GPS Manhole Inspections – Over 3,300 sewer structures have been inventoried and inspected
 - Repairs have been made to 162 manholes, where deficiencies were found
 - CCTV Sewer Inspection – Has identified problem sewers
 - Sanitary Sewer Flow Monitoring – Has identified areas within the City that contribute the most I/I
 - Sanitary Sewer Rehabilitation Project Phase I
 - \$740,000 Ohio Public Works Commission funded project
 - Nearly 9,000 linear feet of sanitary sewer and 51 manholes were lined to stop infiltration leaks
 - A Phase II is planned for 2011
 - System Evaluation and Capacity Assurance Plan – Mandated by the OEPA by July 1, 2012
 - Identifies bottlenecks in the sanitary collection system in order to plan for improvements
 - Storm Drainage Improvements – An aggressive storm drainage improvement program has been implemented along with I/I Reduction
 - Over 30,000 linear feet of creek/ditch have been debrushed to allow for better flows during rain events
 - Removed over 60 blockages on ditches and creeks
 - Surveyed all three major drainage ditches/systems for use with storm water flow modeling and future drainage improvement design
 - City is currently in the preliminary design of relief storm sewers and ditches in the watersheds of Otter Creek, Wolf Creek, and Amolsch/Driftmeyer Ditches

WHAT'S NEXT?

- **Sanitary Sewer Smoke Testing**
 - Smokes Testing is used to detect I/I sources such as connected downspouts, driveway and yard drains, foundation drains, faulty connections, and storm sewer cross connections
 - Areas that were identified as contributing the most I/I to the system are being tested first
 - Residents will receive multiple notifications prior to work beginning
 - Testing consists of forcing smoke down into manholes with a blower
 - **Smoke, under pressure from a blower, escapes through any connections, defects, cracks, leaks, etc. along the way**
 - **The smoke is non-toxic, non-hazardous and is manufactured specifically for this purpose**
 - The smoke quickly reveals sources of I/I and results are documented via photographs and sketches
 - Corrections within the Right-of-Way are the responsibility of the City of Oregon
 - Corrections on private property are the responsibility of the property owner
 - The City will give a notice to the property owner explaining the deficiencies found, as well as, ways to correct the issues noted, with a timeline for correction completion

- Often times corrections can be easy, such as disconnecting a downspout from the home's sanitary sewer lateral, or replacing a broken cleanout cap
 - More difficult corrections can include fixing a broken lateral connection, lining or replacing a cracked lateral line, removing tree roots. These corrections will be given a longer deadline for completion
- **On going sewer maintenance and CCTV sewer inspections**
 - The City will continue working to identify and correct issues within the right-of-way
- **Future sanitary sewer replacement/repair projects**
 - Full sewer replacement in older neighborhoods of the Wheeling Street Sanitary Sewer District
 - Sanitary Sewer Manhole Rehabilitation Project, Phase I – rehabilitation of leaking/defective sanitary manholes

FREQUENTLY ASKED QUESTIONS

- **What is the difference between a sanitary sewer and a storm sewer?**
 - A sanitary sewer is meant to convey wastes from bathrooms, sinks, bathtubs, showers, and industrial processes to the WWTP for treatment
 - A storm sewer is used to convey excess rain runoff or groundwater from private and public land areas to the nearest ditch, creek, stream, pond, or lake in order to prevent flooding
- **What is a private sanitary sewer lateral?**
 - A sewer line on private property that connects a home or commercial building to the public sanitary sewer system. It is the property owners's responsibility to maintain and repair their own sewer lateral.
- **What is an illegal connection?**
 - Any connection that places storm water or groundwater into the sanitary sewer system is illegal and can include sump pumps, yard/driveway drains, and gutters/downspouts
- **How much water does I/I really add to the City's system?**
 - A single sump pump can contribute over 7,000 gallons of clean water over a 24 hour period
 - During a 1" rain event, a typical 1,500 ft² roof will have approximately 900 gallons of storm water runoff, which would be conveyed to the sanitary sewer if the downspouts are connected
- **Why do we need to fix this now?**
 - Additional treatment costs and a WWTP expansion will likely cause major increases in sewer use rates if I/I is not reduced
 - The City is required to address storm water I/I under the OEPA NPDES permit, effective June 4, 2009, or potentially face fines.
 - Sewer backups will continue during extreme rain events
 - Untreated WWTP discharges and SSOs are water quality violations and are detrimental to the environment
- **How much do typical corrections cost?**
 - It depends on the situation. A simple fix, such as disconnecting a downspout can be around \$10/spout. More difficult corrections, such as lateral replacements or rerouting drainage, can range from \$1,000 to \$3,000 and need to be done by a licensed sewer contractor.
- **How do I remove my I/I sources?**
 - Downspouts and sump pumps can discharge into the yard as long as the discharge is at least 10 feet away from the home. Typically, water in the yard will drain to the public street or rear property line
 - A direct connection to the public storm system is only needed if storm water discharge to the homeowner's yard results in a safety hazard (flooding around the house, foundation, or on a driveway or sidewalk). Otherwise, ponding in a yard is safe as long as the water dissipates within seven days
 - In situations where the home is physically lower than both the public street and the rear property line, a direct connection to the public drainage system may be needed
 - In low elevation situations, the City will give much longer correction periods to provide more time for homeowners to plan and construct the needed storm connection
 - In situations where no public storm system exists, the Finance Department and Department of Public Service will assist the homeowner(s)/neighborhood in the process of petitioning the City for the construction of a new storm sewer system. Please note, new storm sewers are typically assessed to the properties that benefit from the improvements
 - The Department of Public Service can assist each homeowner in determining all alternatives for correction
- **Will the City offer any incentives for fixing I/I deficiencies prior to the correction completion deadline?**
 - The City will waive all permit fees for plumbing or sewer work involving the removal of I/I prior to the completion date on the violation notice

DEFINITIONS

- WWTP – City of Oregon Wastewater Treatment Plant, located on Dupont Road, 8 million gallons per day capacity
- OEPA – Ohio Environmental Protection Agency
- NPDES – Nationally Pollutant Detection and Elimination System, a permitting system used by OEPA
- CCTV – Closed Circuit Television, a method of sewer inspection using a remote controlled camera, identifies cracks, leaks, bad joints in sewer pipes
- **OMC 925.26 PROHIBITION OF UNPOLLUTED WATER – states “No person shall discharge or cause to be discharged any stormwater, surface water, groundwater, roof runoff, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process waters to any sanitary sewer.” (Ord. 155-1977. Passed 8-8-1977.)**

The City is always available to answer questions, provide more information, and/or consult with property owners regarding the correction of I/I problems. Please call 419-698-7047 for more information regarding the I/I Reduction Program or visit the Department of Public Service website for project maps, updates, smoke testing information, and general data at:
<http://www.oregonohio.org/Engineering/inflow-infiltration.html>