

Birch Bay Water and Sewer District Inflow and Infiltration (I&I)

November Flooding Event

During the flooding event on November 14-16, 2021, we received 5.9 inches of rain in 48 hours. We had a record Wastewater Treatment Plant (WWTP) daily influent flow of 4.734 MGD for the day, operating with flows nearly 5 MGD for about 20 hrs. straight. That 4.734 MGD smashed our previous record: Previous highest max flow was 2.782 MGD in Dec 2010), 170% above our previous record! This pushed our sewer system capacity to it's limit. We were very fortunate that our system did not fail and we sustained very little damage.



King Tides Flooding

The King Tides that occurred in January 2022, flooded several neighborhoods and again raised the influent level at the WWTP. This occurred shortly after heavy snowfall, which added to the amount of infiltration for this event. Luckily, it was not of the magnitude of the November flooding.

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What is Inflow and Infiltration

Inflow and Infiltration (I&I) is the terminology used to describe when stormwater or groundwater enters the wastewater collection system. Inflow is typically stormwater entering the collection system through sources like manhole covers and improperly connected sump pumps and roof downspouts. The amount of inflow peaks during and immediately after rainfall events and can result in sanitary sewer overflows and sewer backups.

Infiltration is usually groundwater that seeps into the sewer system through

sources like cracked pipes or deteriorating joints. In areas with high groundwater, or when wet weather temporarily raises groundwater levels, infiltration can increase the base flow of the system.

Excessive I & I takes away valuable operating capacity and diminishes the functionality of the sewer system. This can lead to wastewater backups into homes and streams creating environmental hazards. This may also accelerate the need for costly system upgrades, which means increased rates to our customers.

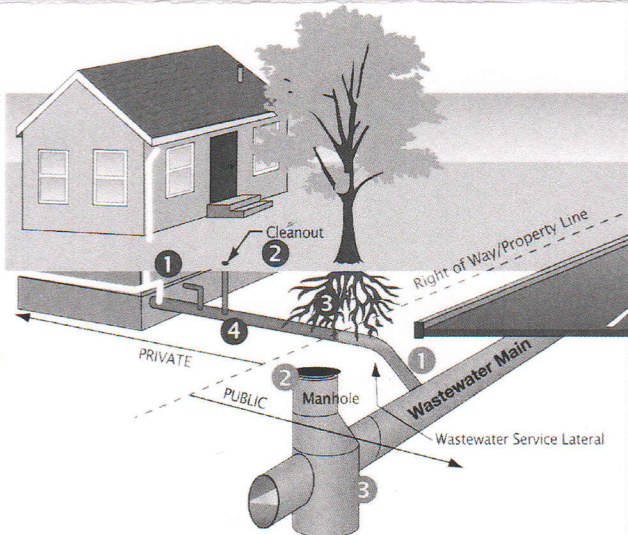
Common areas where inflow and infiltration occur

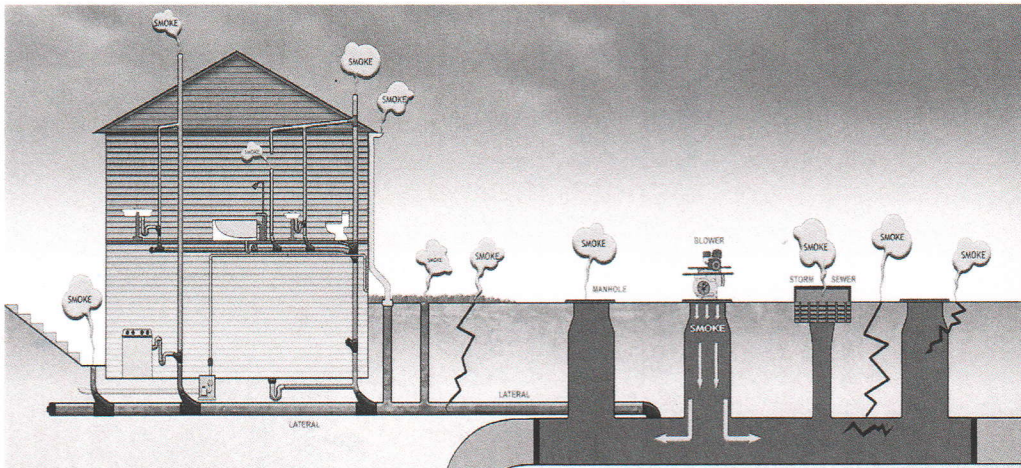
On Private Property:

1. Improper foundation or roof drain connections
2. Uncapped cleanout
3. Root intrusion
4. Breaks or open joints in service lateral

In Public System:

1. Breaks or open joints in lateral or main pipes
2. Faulty manhole covers
3. Open joints or cracks in service chamber





The diagram above illustrates how the smoke from a smoke test moves throughout a collection system. In theory, the only place where an operator SHOULD see smoke is out of the roof vents of buildings connected to the line. Visible smoke from any other area indicates a fault where surface water can infiltrate the system.

BBWSD Excessive I & I Policy

The District's NPDES Permit and District Code prohibit the direct discharge of storm water and other waters ("Direct inflow") and Excess I & I to the District's wastewater collection system, to maintain adequate capacity throughout the District's system of wastewater facilities. Our goal is to avoid damage to the environment and private property by preventing overflows and backups and to make efficient use of infrastructure through timely additions to capacity and enhancement of existing our existing collection system by reducing and eliminating direct inflow and excess I & I.

The District's I&I program includes monitoring of the collection system through routine

maintenance and inspection using smoke testing and video inspection. Our SCADA system monitors influent flow through out our system and alerts us to excessive flow. Our staff can react quickly to identify and correct deficiencies in our system.

Excessive I&I identified on private property is the responsibility of the owner. Our staff will notify the owner when conditions that cause or may cause Direct inflow and/or Excess I & I are detected through routine testing and surveillance, and shall seek voluntary cooperation of the property owners and/or their representatives in correcting the problems.

Stay Safe During Flooding Events

- Evacuate if necessary-call 911 in emergencies.
- Stay out of flooded areas and avoid contact with any type of flood water.
- Stop using plumbing that drains to the sewer system
- Safely turn off electricity to affected areas.
- If you have been exposed to floodwater or wastewater change clothing and shoes and wash affected skin.
- Contact your doctor at first sign of illness or infection.
- Hire professional service to clean up damaged areas of your home.

Who to Call

Stormwater management is coordinated through the Birch Bay Watershed and Aquatic Resource Management (BBWARM). BBWARM works to decrease threats to private and public property from flooding, and improve and protect water quality, aquatic habitat, and the quality of life that a healthy watershed provides. You can reach BBWARM at 360.778.6230.

Sewage backups should be reported to BBWSD, 360.371.7100. If there is an emergency, our after-hours answering service will relay that information to our on-call operations staff. Our operation staff are on-call and available 7 days a week, 24 hours a day.

Preventing Excessive I & I

Identifying and maintaining private lateral sewer lines is the responsibility of the home or building owner. Below are suggestion's to help keep excessive I&I out of the sewer collection system.

- Familiarize yourself with your house's plumbing system and identify the discharge point for roof drains, foundation drains, and sump pump discharges from your basement or crawl space. Disconnect any of these sources that connected to the sanitary sewer system and reroute to outdoor lawn areas or the stormwater system.
- Find and inspect your sewer clean-out: make sure the cap is on tight and the pipe has not been damaged.
- Don't plant trees or shrubs over or near sewer your sanitary pipe is buried. Roots can break pipes.
- If you find your line is broken, have repairs done by a licensed contractor.
- Keep stormwater drains clear of debris.
- Ask for a sanitary sewer inspection when buying a house to identify broken pipes.



Birch Bay
Water and Sewer District
7096 Pt. Whitehorn Rd
Birch Bay, WA 98230
360-371-7100
www.bbwsd.com
office@bbwsd.com