

Combined Sewage Overflow

Environmental Health

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Summary

In Washington State sewer overflows deliver harmful pollutions to King County's waterways. Some sewerage systems in Washington State are made to drain both surface water, and contaminated water from the sewage. Initially Combined sewerage system was used to transfer surface run-off and sewage waste water. Even though many new communities use separate sewerage systems which is two sets of pipes that are used in this system to separate rainfall from polluted water. Sewage overflowed into the waterways is polluting it with bacteria and waste. This is a threat to the overall health of the King County's local waterways. This article will discuss effects of storm overflows on the environment, and inform what King County is doing to reduce Combined Sewage Overflow.

Introduction

Before the sewage system was invented and developed in the United States septic tank was used in its place. The septic tank was invented in 1800's in France and made its way to the United States. At the time it was the most common way to treat household wastewater, and many older residential homes in Washington State still use the septic tank system. Septic tanks require a lot of maintenance and though it works for some residential homes it was not ideal for the entire State to run off of the septic tank system to regulate waste. The sewage system was invented in 1856, but didn't get developed until 19th century because of cost. When the sewage system was first developed it was made to improve waste water and sewage management. At that time Washington State was still a developing state and to cut cost the state decided to use a combined sewage system.

King County is one of Washington States most populated Counties. With population being so high sewage water plants are being filled with waste increasingly fast. Over population may be good for the counties economy, but not good for its environment. King County uses combined sewer overflow to manage both sewage waste and storm water waste. Sewage waste contains faeces, urine, paper and laundry waste. Due to the over population of residents in King County increase of waste is excessive. From my visit to the sewer treatment plant in king county I learned that paper waste has been increasing in the sewer systems. Most companies are making a lot of flushable disposable products. Yes, it is convenient for us to use baby wipes or face wipes and just flush them, but it is just polluting the sewage system even more.

Combined sewage over flow

Purpose of Combined Sewage System

A combined Sewage System is a single pipe system that carries water waste from both residential, industrial and surface water runoff. A lot of states like Washington State went with the CSS plan instead of separating storm water drains and sewage to save cost. It was designed to prevent sewage and untreated water getting backed up into homes, industrial areas and streets. At the time of the development of the CSS pollution was not a concern to the state, and the sewage system was purposely designed to overflow during rainy seasons.

Why are CSO a Problem in King County?

Not so very well planned decisions made by the state in the past is effecting King Counties environment today. During heavy water storms the sewage lines get flooded from waste and excess water causing leakage which is becoming more and more common. The leakage of raw sewer causes contamination of the underground water which can seep into soil. Most storm water overflows take place in fall, winter and spring seasons in Washington due to the heavy rain. In King County because of the overpopulation it doesn't take much rain fall to cause overflows thus sewage treatment plants have to work harder to regulate the sewage so overflows don't occur.

There are a few factors that contribute to the combined sewage system to over flow one of them being is that King County is Washington States most populated counties holding a population of 2.044 million as of 2013 (Kingcounty.gov). The county continues to grow each year and more

residential homes and industrial development is made. Although increase of population is great for the counties economy it is not helping the environment. The high population of people in King County is causing more pollution which is also contributing to water waste pollution. Residential users are flushing away none recyclable products. Many of products being disposed through the house hold toilet cannot decomposed or be recycled. This results in over filling the sewage system faster with none recyclable products. (Personal Contact Bryson)

Combined sewage system drains both storm water and wastewater using the same pipe line. For states like Washington that experiences high rain falls seasons which end up flooding the streets and roads which later end up in the discharging into the sewer system and overflowing it.

Sewage overflow has a hygienic impact and affects public health. The surface runoff or sewage overflow can carry animal and human faeces a long with pollution and bacteria and once that runs into water bodies the water becomes contaminated and threatens the health of humans and animals.

Toxicity is another problem that is developed from heavy rainfalls which can come from untreated wastewater that was discharged by combined storm overflow, metals, pesticides, and other poisonous materials that causes effects on the environment by slowly accumulating in areas. Runoff is a substantial source of toxic contaminations in the environment (Seattle.gov/environment).

What is being done to reduce CSO?

King County has over 11 sewage water treatment plants that help manage and treat the sewage system water waste. Because King County is over populated more waste is being produced which is increasing the demand of waste water that needs to be treated. Scott Bryson informed me that King County is working on treating water faster before overflows occur from rain storms. They are also building bigger pipes and underground tanks to store waste water which will control in CSO's. According to (KingCounty.gov)

According to (Kingcounty.gov) both King County and the City of Seattle own and maintain CSO facilities within the City of Seattle. King County manages 37 CSO locations and Seattle manages 110 locations that discharge into Lake Washington, Lake Union, the Duwamish River, Elliott Bay, and Puget Sound. Washington State Department of Ecology is trying to regulate CSO's discharge and reduce the amount of leakage(KingCounty.gov).

King County has reduced the amount of untreated wastewater released to waterways. In the 1960s, around 30 billion gallons of untreated water flowed into our waterways each year (Kingcounty.gov). King County invested up to \$389 million dollars into its Protecting Our Waters Program which began in 1979. The amount of polluted water released each year went from 2.3 billion gallons to about 0.8 billion gallons(Kingcounty.gov).

Although it will cost the state of Washington thousands of dollars to replace combined sewage systems with single sewage system. They are separating storm water and sewer lines in newly developed areas. This will help reduce and manage the amount of waste water that enters sewage treatment tanks which will lower the amount of overflows in the future.

Adding and expanding sewage water treatment plants will help keep up with the high volume of sewage waste. King County has increased its utility water bills by \$41.00 in the past decade because of the demand they have to keep up with treating waste water (Kingcounty.gov). If we build more plants more waste water can be treated and keep up with the population rise of pollution produced.

King County is trying its very best to protect the Puget sound waters, and its aquatic life. Each year they set projects to help improve water waste. The Barton street pump station which sends flows of water to the water treatment plant was upgraded to create less waste and to be more environmentally friendly. The station now can pump waste water to the treatment centers using less energy and causing less odors. The new upgrade has increased its capacity to hold more water. It also replaced outdated electrical equipment and pumps (Kingcounty.gov)

A lot of urban cities in Seattle are creating rain gardens in various locations to help catch rain storm water so it can control the amount that is being flooded into the sewer systems. Rain gardens are made with materials that allow the garden to absorb higher volumes of water, and distributing it throughout the garden without creating any runoffs (uaex.edu).

CSO Water Quality Management

Washington State has a Water Pollution Act that was made in 1987 regulating the states government to inforce plans made by the counties to manage water quality and to reduce CSO discharge into natural bodies of water (fortress.wa.gov). According to the department of ecology

each county is responsible to manage a minimum of nine controls to keep the waters clean and protected from CSO discharge. According to (Fortwess.wa.gov) The nine controls include the following:

- 1. Proper operation and regular maintenance programs for the sewer system and CSO outfalls.
- 2. Maximum use of the collection system for storage.
- 3. Review and modification of pretreatment requirements to ensure that CSO impacts are minimized.
- 4. Maximization of flow to the POTW for treatment.
- 5. Elimination of CSOs during dry weather.
- 6. Control of solid and floatable materials in CSOs
- 7. Pollution prevention programs to reduce contamination in CSOs.
- 8. Public notification to ensure that the public receives adequate notification of CSO occurrences and CSO impacts.
- 9. Monitoring to effectively characterize CSO impacts and the efficacy of CSO controls.(fortwess.wa.gov)

Washington State also has Clean Water Act that was adopted by the state in 1972. This act requires all the states in United States to keep their waters up to regulations to keep clean for waters to be fishable and swimmable (Ecy.wa.gov).

How is CSO monitored?

The Clean Water Act and Water Pollution Act requires Washington State to monitor and keep track of the water quality in King County and send in an annual report of progress made to keep the CCS from overflowing into the Puget Sound and other local lakes and rivers. According to (Ecy.gov.wa) The annual report must contain the following information:

1. The condition and operation of the combine sewer system (CSS) components. Most importantly, the end-of-pipe measures that show trends in the discharge of CSS flows to the receiving water body, such as reduction of pollutant loadings, the frequency of CSOs, and the duration of CSOs;
2. How water quality standards in the receiving water bodies are being met as a result of the implementations of the BMPs and/or the approved CSO control measures;
3. Overall status of the CSO LTCP, if applicable;
4. Key CSO control accomplishments and design and construction progress in the previous year (Ecy.gov.wa)

Water Treatment Plants are treating and testing water levels before it is discharged into the waterways. King County's plants must regulate water and control PH levels so it is safe to release into the water and won't harm marine life.

Another way the King County is helping monitor CSO is by having CSO warning signs around beaches, lakes and rivers or wherever discharge can reach. This helps spread the awareness of CSO's and if one occurs people can notify the County by calling the number on the signs.

Warning signs also help prevent people from fishing or swimming in the water while it is contaminated. Ideally people should not swim or fish in contaminated water up to 48 hours (Kingcounty.gov).

King County constantly keeps track of CSO status, and offer local residents to keep updated on local CSO status by going on the KingCounty.gov website where they can access a map that will show areas that are experiencing sewage overflows in the last 48 hours and areas that are safe and not experiencing CSO. This helps that state and local residents to be aware of CSO's during rainy seasons in Washington State.

What can you do?

Washington State and King County Metro is working hard to manage and treat combined sewage overflow problems. As residents of Washington State we can all do our part to help eliminate sewage water waste from our local waterways. How can we do this? Start by managing the rain on your property and keeping the rain that falls on your property out of the combined sewer system. This reduces the chance of overflows into area waterways. Also repairing side sewers will help prevent groundwater from seeping into sewer pipes and eventually overflowing sewer systems. As humans we can always try our best to prevent pollution. We can do this by not flushing trash and none recyclable hygiene products. Just last year King County's waste water division spent over \$120,000 just to take the wipes, tampons, and other trash that came into the treatment plants (Kingcounty.gov). Also don't flush down grease because the grease sticks and builds up into the sewage system and can block pipes. Do not flush down chemicals or medication down the toilet or sink. Any toxins flushed down drain waters is harmful for the environment.

Conclusion

Untreated Sewage Overflow can have substantial amount of impact on the environment and the overall health of the waterways in King County. Washington State along with King County has made a significant amount of progress to reduce CSO's over the years, and continue to do so. Since 1979, King County has reduced its overflows by 90 percent. This has kept more than 2.3 billion gallons of sewage and storm water out of local waterways(Kingcounty.gov). Because the County is over populated more sewage waste is being produced and having a Combined Sewer System is creating a hazard for water pollution. About 80% of sewage over is made of Storm Water Runoff leaving 20% of sewage waste(Seattle.gov). Washington State does experience high volumes of rain fall each year which contributes to Storm Water Runoff. Though we cannot get away from the rainy seasons we can all work together with the state to keep pollution and waste off the streets so it does not end up in our waterways. Not many people have realized the issue with CCS, and do not understand its impact on water pollution and health hazards. Raising awareness of CCS can help everyone to be productive and play their part to keep the waterways clean.

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