Impacts of Wastewater Effluent: An Observation

EECO 586 The Biosphere and Sustainability

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**Observation**

 I live in Napanee Ontario and work in Prince Edward County Ontario. I m very familiar with "The County" as its popularly known. I have always taken my family out to visit the many parks and conservation areas in the county during the spring and summer months. This time we visited the Prince Edward dog park . There is stream that flows at the southern edge of the park and there is a bridge for park user to cross the stream and next to the bridge is an installed outfall coming from the towns wastewater treatment plant. The first attraction was the coloration around the rocks. Although, the effluent is clear and appears clean. I noticed the erosion and loss of habitat as the proximity gets closer to the outfall area.

Similar to this observation. many outfalls from other wastewater treatment plant release effluents upstream into the receiving water body and downstream another municipality uses the same water as its source water and provide treatment prior to drinking and domestic purpose.

When we look at the issues in the environment as a result wastewater effluent discharge, the quality of wastewater varies according to the types of influents the waste water treatment facilities receive such as domestic wastewater, dry and wet atmospheric deposition, urban runoff containing traffic‐related pollution, or agricultural runoff (Edokpayi, Odiyo and Durowoju., 2017) . For example, the wastewater from a winery or brewery acutely changes the pH of the influent being received for treatment and it will affect all the biological processes needed to treat the wastewater properly, therefore, the wastewater effluent discharged will be toxic to the environment. The natural cycle in the aquatic environment may become upset from the characteristics of the wastewater (Kerri & Brady, 1997, p.28).

**Interpretation**

The impacts of wastewater effluent discharge on water quality and ecosystems can vary greatly, depending on factors such as the volumes and quality of effluent being discharged and the ability of the receiving waterway to dilute and assimilate contaminants. “The ability of a receiving stream to accept wastewater is limited by its capacity to supply oxygen for stabilizing organic substances” (AWWOA, 2015, p.9-1). Increase levels of organic matter result in the increase of bacteria production, which can cause an increase demand in oxygen. Most aquatic life depend on dissolved oxygen for respiration, however, the increased level of organic load in the streams and other waterways causes a reduction in the dissolved oxygen content and aquatic lives are deprived of oxygen. (AWWOA, 2015, p.9-1).Some sewage treatment plants add chlorine to their final effluent to kill bacteria, viruses and other pathogens, and the chlorine is also acutely toxic to fish. Moreover, the combination of chlorine and ammonia (a product of nitrogen metabolism) in water will form chloramines, which are highly toxic to fish and other.

**Expert Consult**

 Miss Cora Lee Creighton, a wastewater treatment operator for the corporation of the county of Prince Edward was my chosen expert consult. As a water and wastewater operator, she has vast experience in the water and wastewater industry and has worked for different municipalities in the region. She has first-hand experience in drinking water and effluent quality monitoring. Cora stated, there's more influents from storm drains also known as "grey water" that impacts the quality of effluents leaving the wastewater treatment plant. Grey water is defined as urban wastewater without any input from toilets and so generally includes sources from baths, showers, hand basins, washing machines, dishwashers and kitchen sinks (Jefferson and Palmer, 2004) . The population can help reduce these impacts by conserving water, which will decrease the volume that needs to be treated, thus resulting in better plant efficiency. One can also be careful with the disposal of toxins in the sewer system. It’s easier to keep contaminants out of the system in the first place, than to remove them later.

Cora gave an example about the City of Kingston having a great public service program where they have radio ads that inform people about issues that would affect them and some of these are wastewater based such as properly disposing of medication, what is flushable and on the city of Kingston websites. there is a waste sorting lookup database that helps determine the best place to dispose materials (waste tools, n.d). Many municipalities have flyers and parts of their websites that are dedicated to informing the public of what is flushable where they use a lot of graphic content that would appeal to users and adds a bit of fun into how to reduce pollutants. Educational programs are the best way to get the word out to the public because they don’t have the information to make the best decisions with regards to sustaining the environment.

Education would help in enforcement of public service announcements related to restriction on disposal and collection of household waste. If more people were aware of the issues , the impacts will be less. For example, providing the education on what medical waste does to the environment after flushing down the drains would be the first step to changing people’s behavior. Once they have the information on what to flush and what not to, provide a location where the non-flushable items should go. For instance, people can return any unused medicine back to a pharmacy for safe disposal. Providing them exact locations where they can dispose of such items would stop a lot of people from flushing them. Lastly is enforcement, water restrictions, having someone inspect houses to make sure there sump pumps aren’t going into the sewer system, sewer fogging also works for figuring out who has their sump pumps hooked into the sewer. A company comes in and puts a smoke down the sewers if it comes up in someone’s basement there is a cross connection.

**Conclusion**

We need to look at the connection and interaction between the wastewater treatment systems and the aquatic environment. Everything we do has some kind of impact, but some decisions and actions are more important than others. Controlling pathogenic organism still remains one of the major objectives of wastewater treatment along with protecting the receiving environment. Effluents can raise the temperature of receiving streams and disrupt the natural balance of aquatic life. Natural cycles of interest in wastewater treatment include the natural purification such as the cycle of evaporation and transpiration. These cycles are occurring continuously in the wastewater treatment plant and in receiving water, although the cycles may occur at different rates depending on the environmental conditions (Kerri & Brady, 1997, p.28).

References

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