



## Wastewater Treatment Facility




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Wastewater Treatment Facility  
 45 Weld County Road 2  
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## Mission Statement

To safely operate the Wastewater Treatment Facility in a fiscally responsible manner, while continually complying with the discharge permit and other applicable regulations as entrusted to us by the citizens of Northglenn.

## Wastewater?

Wastewater is water that has been used by a community to carry away unwanted solids and liquids from businesses and households. Wastewater consist of two main groups (organic and inorganic). The inorganic groups consists of sand, coffee grounds, egg shells, etc. The organic group consist of ground food products, oil, grease, fats, fecal matter, etc. .

## Why treat it?

There are two main reasons for wastewater treatment. One is to protect the health of the public and the second, is to protect the environment. One of the most common ways to spread disease is through fecal contamination, so treatment of wastewater protects the public health by preventing the spread of disease causing bacteria and viruses. Some of the diseases prevented by wastewater treatment include Typhoid, Cholera, Dysentery, Polio, and Hepatitis. Wastewater treatment protects the environment by removing the oxygen depleting substances in wastewater and other unwanted pollution. The oxygen depleting substances cause fish and other aquatic life to die because it uses up all the oxygen. The other pollutants

include nutrients such as Phosphorus and Nitrogen. These nutrients can cause eutrophication or the aging of a body of water. This can causes depletion of oxygen through algae blooms. If eutrophication happens unnaturally, the natural ecosystem becomes upset or destroyed.

## The New Facility

The new Wastewater Treatment Facility is a Biological Nutrient Removal (BNR) Facility. The overall rating for the new Facility, in combination with the existing Lagoon System, is 6.5 Million Gallons per day. The facility has the capability of removing two nutrients (Nitrogen and Phosphorous). The current Discharge Permit has only Nitrogen listed as Ammonia.

The wastewater is pumped from the City's collection system to the Wastewater Treatment Facility. The wastewater first enters the Lagoon system and then it flows by gravity to the new Plant. On its way, it is mixed with microorganisms. The organisms used at the plant naturally occur in the soil. The first basin the wastewater enters is the



**The Aeration Basins are the heart of the treatment process.**

Anaerobic Zone. Anaerobic means no oxygen. This Zone stresses the microorganisms into releasing most of the their phosphorus. Next, the wastewater enters the Anoxic

Zones. Anoxic means no free oxygen, but Nitrate ( $\text{NO}_3$ ) is present. The microorganisms consume food and get oxygen from  $\text{NO}_3$  by stripping the three oxygen atoms from the  $\text{NO}_3$  molecules. Once the organisms uses all the oxygen from the Nitrate, Nitrogen gas is released. Then the wastewater flows into an Aerobic zone. Aerobic means free oxygen is available. At the beginning of this basin, the phosphorus is taken back into the organisms in greater quantities than released. In this basin, the rest of the food is also consumed and ammonia is converted to  $\text{NO}_3$ . The wastewater is recycled back to the Anoxic Zones for removal of  $\text{NO}_3$ . Next, the wastewater flows to Clarifiers which allow the solids to settle out. The settled solids are pumped



**Clarifier**

either to the front of the process so the microorganisms can feed again or are wasted to keep the system in equilibrium. The clear water on top of the clarifier is sent to the UV system for disinfection. Disinfection kills most of the remaining organisms. After disinfection, the water is pumped into Bull Reservoir. Once the water is in the Reservoir, it is stored until irrigation season. At which time, the water is pumped into Bull Canal for distribution to the farmers.