

### Overall Performance

The WWTF produces a high quality effluent, removing approximately 98% of the organic material in the wastewater and approximately 95% of the suspended solids material. The facility and its property are adaptable to meet future wastewater discharge quality requirements.

The WWTF meets all regulations for water quality standards in a cost effective manner, and is expandable for the growth that is expected over the next several decades.

The total amount of pipe used at the WWTF is equivalent to the length of 26 city blocks.

## Touring the Wastewater Treatment Facility

Guided tours of the Wastewater Treatment Facility are available to the public. The tours



are approximately one hour long and provide a great learning opportunity for science or environmental clubs, civic organizations, home-schooled students and others.

To set up a tour date, call Michael Wilson, Environmental Compliance Officer for the City of Derby, at 788-1151. Please call two to three weeks in advance of desired tour date.

657 million gallons of wastewater were processed in 2008.

# City of Derby



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## Wastewater Treatment Facility

# The Process of the Wastewater Treatment

As Derby grows, so must the services it provides, including the collection and treatment of wastewater. The City of Derby has made continuous improvements to its Wastewater Treatment Facility (WWTF) over the last several decades,

The amount of concrete used to construct the facility would pave 25 city blocks.

confirming Derby's commitment to its future growth potential

for both businesses and residents, while meeting its commitment to a clean environment.

## How does the WWTF work?

### Headworks Facility

The Headworks Facility is the beginning point of the wastewater treatment process. Its purpose is to remove trash, grit, and other large debris. The existing building, built in 1991, was expanded to hold new variable speed drivers for two of the four influent pumps. These pumps provide continuous flow throughout the plant process.



The facility also includes a second barscreen, two screening compactors, internal components of a vortex grit unit, and a grit classifier.

There are more than 110 miles of pipe in the wastewater collection system.

### Aeration Basin

The aeration basin replicates nature's process of cleaning contamination, only much faster. Oxygen is supplied through surface aerators. Oxygen is required as energy for the microorganisms to treat the wastewater. In only 24 hours, the water is clean.



As the contents of the basin circulate through the racetrack configuration, part of the flow is directed from the aeration basin to the anoxic

basin where microorganisms trigger a release of nitrogen gas.

40 million 8 oz. glasses of water would fill the aeration basin.

### Final Clarifiers

Following the aeration basin process, water flows to existing circular clarifiers where solids settle to the bottom. Settling provides a clear effluent flow over the clarifier weirs.



The clarifier's performance is enhanced by use of baffles. Baffles redirect the flow rising along the outer walls to the center of the clarifier. The

flow pattern becomes more horizontal

The average amount of power used at the WWTF in a week is equivalent to burning 12,500 light bulbs.

The amount of sludge processed per year would fertilize 400 acres of agricultural land.

and less vertical at the water surface, and prevents solids

from passing out of the basin.

Weir covers are used to eliminate algae growth on the clarifier weirs. Algae interferes with the UV disinfection process.

### Ultraviolet Disinfection System

Ultraviolet disinfection is an environmentally friendly alternative to traditional chlorination/dechlorination. Ultraviolet light effectively disinfects wastewater effluent without introducing harmful chlorine by-products.

### Sludge Handling Facilities

Sludge handling facilities include two sludge holding basins, an aerated holding basin, and a sludge handling building.



The building contains blowers that supply air to the aerated holding basins, pumps that transport sludge into and out of the basins, and a gravity belt thickener. The gravity belt thickener dewateres the sludge, which helps reduce the number of trips to the agricultural field.

The WWTF has the capacity to process as much as 2.5 millions gallons of wastewater per day. In 2009, it is processing 1.8 million per day.