

Facts About the Facility

- ✦ The south Wastewater Treatment Plant is designed to treat an average flow of 6.8 MGD. It occupies 192 acres just in the lagoon area. The new Water Reclamation Facility, when built to its full capacity, will be able to treat 2.5 MGD of flow in only 20 acres.
- ✦ Between the plant and off-site pump station, 10,644 cubic yards of concrete were placed – enough concrete to pour a 4' wide sidewalk 41 miles long.
- ✦ 650 tons of reinforcing steel was embedded into concrete on the project. This amount of steel would nearly stretch across the state of Kansas.
- ✦ The biological treatment basin is about the size of an Olympic swimming pool. With walls approximately 24 feet tall, 32,130,000 – 8 oz. glasses of water would be needed to fill it.
- ✦ The deepest part of the plant is the on-site pump station at 40 feet deep.
- ✦ Work began in January 2010 with excavation in a snow storm and ended during the hottest summer on record.
- ✦ At the height of construction, more than 30 people at one time were working on the site.
- ✦ Local subcontractors and suppliers were used for the fencing, roofing, carpeting, concrete and earthwork.
- ✦ Using precast panels for the walls and roof allowed the Process Building to go up in only one week.
- ✦ Final effluent discharged from a properly operated wastewater treatment plant is nearly as clean as regular tap water.
- ✦ The average person in the U.S. uses 50-100 gallons of water per day. Flushing the toilet takes up the largest amount of this water.

BENEFICIAL REUSE SYSTEM AND HOLDING POND

Treated effluent is discharged to the on-site holding pond. The pond holds approximately 4.33 MG. This water will be re-used for irrigation at Mariah Hills Golf Course and other public areas, which continues the vital practice of beneficial re-use started at the south Wastewater Treatment Plant. The system has the potential for additional irrigation or industry use in the future.

In times of low irrigation use, water can be discharged at the outfall cascade which re-aerates the effluent water before it is discharged.



DESIGN-BUILD TEAM MEMBERS

- ✦ Project Engineer



- ✦ Project Contractor



- ✦ Project Architect



CITY OF DODGE CITY



Water Reclamation Facility with Beneficial Reuse

4120 NORTH 14TH AVENUE
DODGE CITY, KS 67801
620-225-4200



WATER RECLAMATION FACILITY

To accommodate business development including a new events center, casino and hotel, as well as projected population growth, the City of Dodge City elected to construct a new water reclamation and beneficial reuse facility. The new plant is designed to process flows through 2030 with an average flow of 1.3 MGD. It is capable of future expansion to 2.5 MGD and a peak daily flow of 8.0 MGD.

The north wastewater treatment facility requires less space than the treatment plant south of the city. The new plant uses the latest technology in biological treatment processes including membranes and ultraviolet (UV) disinfection, and produces a high quality effluent available for irrigation of public spaces, which helps save valuable water resources.



INFLUENT PUMP STATION AND HEADWORKS

The collection system drains to a common pump station at the head of the wastewater treatment process. This pump station provides the force necessary for the wastewater to flow through the plant. Treatment starts in the headworks facility, where screening equipment removes non-treatable debris, materials and grit from the influent flow.

BIOLOGICAL TREATMENT

The new plant has four concrete basins:

- ✦ one biological treatment basin with two trains
- ✦ one membrane basin with four trains
- ✦ two 70' diameter aerobic digesters

Organics and nutrients are removed through the biological treatment processes. The biological process uses a combination of oxygen addition (aeration) and mixing to achieve treatment goals. There are separate zones for each process. A diffused air system and submersible mixers provide aeration and mixing in the aerobic zone, while submersible mixers are used in the anoxic and anaerobic zones.

CLARIFICATION AND DISINFECTION

After the biological basin, flow is sent to the membrane system in the Process Building which clarifies and filters the flow in one basin. Treated water flows through thousands of microscopic pores in the membrane filters. Solids are left on the outside of the filters and the clear flow is sent to UV disinfection. Some settled solids are sent back to biological treatment processes to aid in breaking down incoming sewage. Other solids are eliminated from the process to keep the system in balance.



Ultraviolet disinfection is used to prevent reproduction of disease-causing micro-organisms. The plant's disinfection system includes closed chamber, medium pressure – high intensity lamps.



BIOSOLIDS HANDLING

Stabilized sludge from the digestors is dewatered to increase the solids concentration and facilitate handling, storage and disposal. Solids dewatering is achieved with a centrifuge. Dewatered solids are conveyed to a covered storage area until the biosolids are applied to city-owned acreage.

PLANT PROCESS AND ADMINISTRATION BUILDINGS

The first floor of the Process Building houses the screening equipment and membrane systems. The basement houses pumps, piping, UV disinfection equipment, and re-use pumping systems. Each floor includes separate rooms containing blowers and electrical equipment.

The Administration Building has fourteen rooms on one-level – including a meeting room, offices, laboratory, restroom, shower room, mud room/lockers, control room and electrical equipment.

