Greenfield WW Treatment Plant (2012)

The City of Greenfield incorporated in 1947. Greenfield is located between the Gabilan Mountain range to the east and the Santa Lucia Mountain range to the west; and is located in the heart of the Salinas Valley, approximately 135 miles south of San Francisco, 95 miles south of San Jose and 60 miles north of Paso Robles. The city has a total area of 1.7 square miles, with a population to be 17,547 (2011).

The City of Greenfield's Wastewater Division maintains and operates 20.8 miles of gravity sewer collection pipeline and force mains including six(6) lift stations. The City also accepts wastewater under agreement with the Santa Lucia Shopping Center.
Sewage is conveyed to the Wastewater Treatment Plant (WWTP) east of Greenfield. The WWTP was reconstructed and completed in 1978; additional plant improvements have increased the capacity to 2.0 million gallons per day (MGD). Current average daily flows approach 1.5 MGD.

The City of Greenfield Wastewater Treatment Plant (WWTP) is located easterly of the City along the westerly banks of the Salinas River at the easterly terminus of Walnut Avenue. The WWTP was reconstructed and completed in 1978. Additional plant improvements completed in 1993 increased the capacity to 1.0 million gallons per day (MGD), and subsequent improvements increased the capacity to 2 MGD.

The treatment process, generally considered primary treatment, is to remove a portion of the solids in the wastewater through a settling process. The solids collected are transferred to a basin in which they are reduced in a process known as aerobic digestion. After digestion, the solids are dried in a lagoon and then buried. The basic disposal concept is to percolate all the wastewater into the ground in a manner that protects the public health, maintains or enhances the existing groundwater quality and does not create a visual or odor nuisance. No wastewater effluent is discharged to any of the adjacent surface waters.

The major portion of the settleable solids are removed by settling in the primary sedimentation tank and then decomposed by aerobic digestion. The settled wastewater is then conveyed to a series of ponds where treatment of dissolved organic matter through a natural oxidation process occurs. Final effluent disposal is accomplished by percolation through the sandy soil into the ground, eventually reaching the groundwater underlying the area. In addition, a spray irrigation system with an estimated capacity of 2.0 MGD has been added to the disposal facilities.

The design of the major plant units generally follows conventional practice. The treatment structures are constructed of reinforced concrete and the pond embankments are constructed of compacted native soil. All wastewater flow through the plant is by gravity and the only process pumping used is for transferring sludge and scum from the sedimentation tank into the digestion tank. The plant water system includes a well on the plant site. Well water is pumped into a hydropneumatic tank.

The flow enters the plant headworks through a 14 inch diameter cast iron pipe which conveys the raw wastewater from the collection system to the plant. At the headworks the wastewater passes through dual grinders installed in 1998 which shred the solids, and through a 6 inch Parshall flume which measures the flow.

The wastewater then passes into the primary sedimentation tank where quiescent settling occurs. Here most of the settleable and much of the suspended solids settle to the bottom of the tank and are pumped to the digester. Scum is also removed from the surface of the sedimentation tank to a scum pit from which the scum is periodically pumped to the digester.

The effluent from the sedimentation tank flows over weirs and in the 18 inch diameter effluent pipe which conveys the wastewater to the pond area. Sludge and scum pumped from the sedimentation tanks into the digesters are decomposed aerobically and stabilized. A diffused aeration piping is installed which is designed to operate 24 hours per day. Supernatant and overflow pipes are connected which allow a simple, manually controlled process to be maintained.

Aerobic digestion is used for three principal reasons; ease of operation, cost advantage, and minimal odor potential. The Greenfield wastewater has a high sulfur content with a resulting hydrogen sulfide odor problem when operating under anaerobic conditions; thus through the use of the aerobic digestion process, the possible generation of hydrogen sulfide is minimized.

The digesters can be operated either on a continuous or a fill and draw basis. Waste digested sludge can be piped to either the upper or lower drying beds and then removed and used on adjacent fields or may be buried after drying. The three disposal ponds provide oxidation which supports biological activity to further treat the wastewater. Two percolation ponds serve as disposal ponds.

Transfer piping between all the ponds is provided which enables removing any one pond from service for scarifying or maintenance without preventing use of the remaining ponds. The transfer piping is arranged so a number of combinations of series and parallel operation of the oxidation and percolation ponds may be accomplished. The oxidation ponds normally are operated in parallel with the flow divided approximately equally to each pond. Maintenance requires that the percolation ponds be occasionally taken out of service. When this occurs the entire flow is diverted to another pond. This operating condition normally lasts approximately two days when it occurs.

The existing spray irrigation system consists of a pump station building with two booster pumps with a capacity of about 600 gpm. The spray irrigation system is composed of above ground portable farm type distribution piping with riser mounted spray heads. About 13 acres are irrigated in this manner. Periodically the above ground pipes are moved and the spray fields disked to cut vegetation.

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IMPROVEMENTS SINCE 1987

- A second Primary Clarifier at the WWTP.
- Replacement of the existing communator at the WWTP with two larger more efficient sewage grinders.
- Pond And Spray Field Capacity - Pond acreage is 10.5 acres in 5 ponds. 10 acres of spray fields was expanded to 25 acres with the purchase of an additional 15 acres and subsequent spray field expansion.
- The aerobic digester was modified with replacement of the mixer with a diffused aeration system.