TREATMENT PROCESS

SEWERS

Wastewater comes to the City's water reclamation and treatment facilities via the sewer system. Most of it comes from inside houses - from sinks, dishwashers, bathtubs, toilets and washing machines. Some of the water that is treated comes from commercial and industrial users.

HEADWORKS

The first place the wastewater arrives at in the water reclamation and treatment plants is the Headworks area. The initial materials removed from wastewater are the most noticeable ones like wood, sticks, plastic and rags. Bar screens let the liquid flow through but stop the big objects. Sedimentation tanks are then used to capture sand and other gritty solids. Fifteen tons of these solids are removed and driven to landfills every day. Wastewater then continues to primary treatment.

PRIMARY PROCESS

Most of the solids are removed here after they sink to the bottom of covered, underground tanks and are pumped to the digesters. The tanks are covered to reduce odors. Other wastes are skimmed from the surface. The liquid is then pumped to the secondary treatment system for further treatment.

SECONDARY TREATMENT

Bacteria is added to the aeration tanks for the nitrification-denitrification process. The bacteria feed off the organic wastes in the wastewater. Oxygen is added in the nitrification process to speed up the bacteria's rate of decomposition. The nitrification-denitrification process reduces the amount of nitrogen in the plant's effluent. The wastewater, rich in activated sludge, then flows to the secondary clarifiers.

CLARIFYING TANKS

The second stage of secondary treatment involves the settling of activated sludge by gravity in the final settling tanks, or secondary clarifiers. A portion of this settled activated sludge is returned to the aeration tanks (returned activated sludge, or RAS) to maintain biological equilibrium in the aeration tank, while the remaining portion is discharged/wasted (waste activated sludge, or WAS) to the sewer. All of the waste activated sludge flows to the Hyperion Water Reclamation Plant for further processing. Once at Hyperion most of the sludge is sent to the oxygen reactors to continue biological treatment.

TERTIARY TREATMENT

After secondary treatment, the wastewater flows through diamond-shaped cloth filters to remove any remaining solids. To improve filtering, a cationic polymer is used as a coagulant to capture and remove any remaining colloidal-sized solids.

DIGESTION

Again, we call on Mother Nature to help us, this time to destroy the disease causing organisms (pathogens) in the biosolids. The solids that were removed from primary and secondary treatment are now pumped into huge, totally enclosed, egg shaped tanks called digesters. Bacteria and other microorganisms that live without oxygen thrive here. It takes about 15 days for these microorganisms to eat half of the biosolids, destroy the pathogens and release a natural methane gas that has tremendous energy value.

DEWATERING

The biosolids are very wet when they leave the egg shaped digester. To lower transportation costs, we reduce the amount of water in the biosolids by sending them through a centrifuge which acts like the spin cycle of a washing machine and removes one-fourth of the water.

LAND USE

Biosolids are nutrient-rich organic materials that are very valuable to farmers and others who need amendments and composts to improve their soil.

The City owns a 4,688-acre farm site, Green Acres Farm in Kern County, where 99.9% of the biosolids are applied. Non-food crops such as corn, wheat, and alfalfa are grown on the farm. Class A is the required standard for applying biosolids in Kern County and Terminal Island's product exceeds that quality level. Other biosolids are mixed with green waste and zoo wastes and used as landscape compost or for non-food agricultural applications.