El Segundo Environmental Committee Tour of the Hyperion Water Reclamation Plant

October 30, 2023

This is the tour group, standing in front of one of the new “egg shaped” digesters.

The tour was hosted by Hi-Sang Kim and Tim Dafeta from the Hyperion staff. Professor Michael Stenstrom of UCLA accompanied the tour.

The tour started about 9 AM in the Learning Center. The Learning Center is set up to educate all level of visitors from school kids to college students and engineers. The first hour or so of the tour was spent here with Hi-Sang and Tim explaining the treatment processes and upcoming improvements to turn Hyperion into a full water reclamation plant.

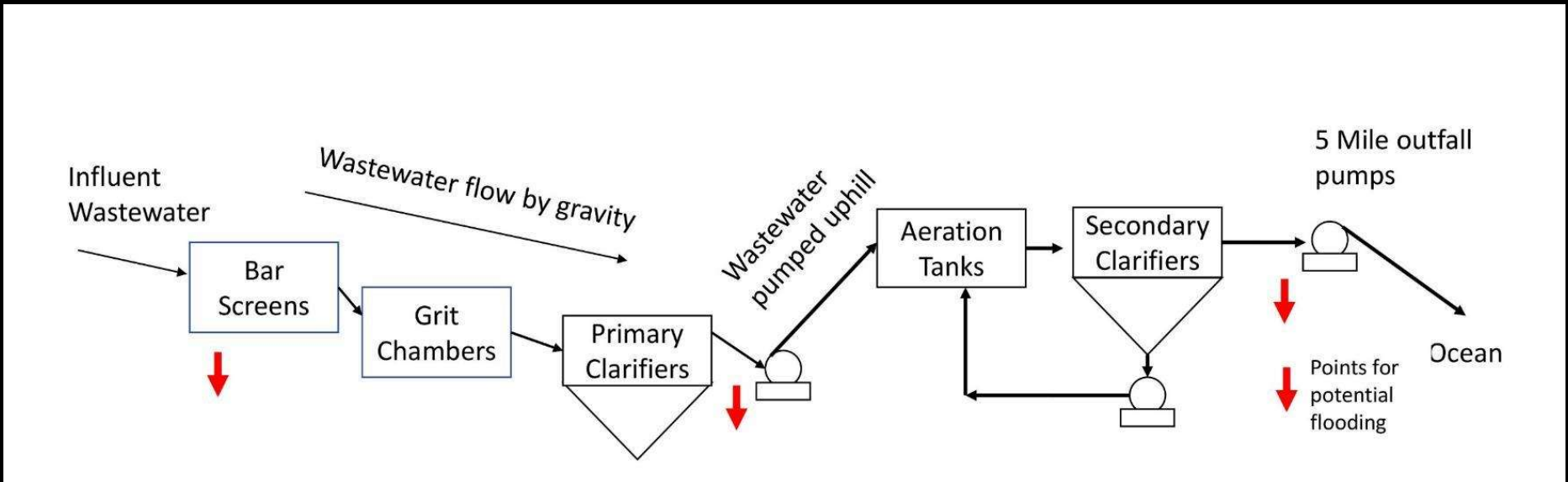
The discussion and questions concentrated on the headworks and primary treatment parts of the plant, where odors need to be controlled.


Digestion
Dewatering
Biosolids Storage
Sand Filter
Tertiary Treatment
BIOSOLIDS


INSIDE A WASTEWATER TREATMENT PLANT
3
Secondary Treatment

The circular structure at the back is the same size as the larger influent pipes to Hyperion

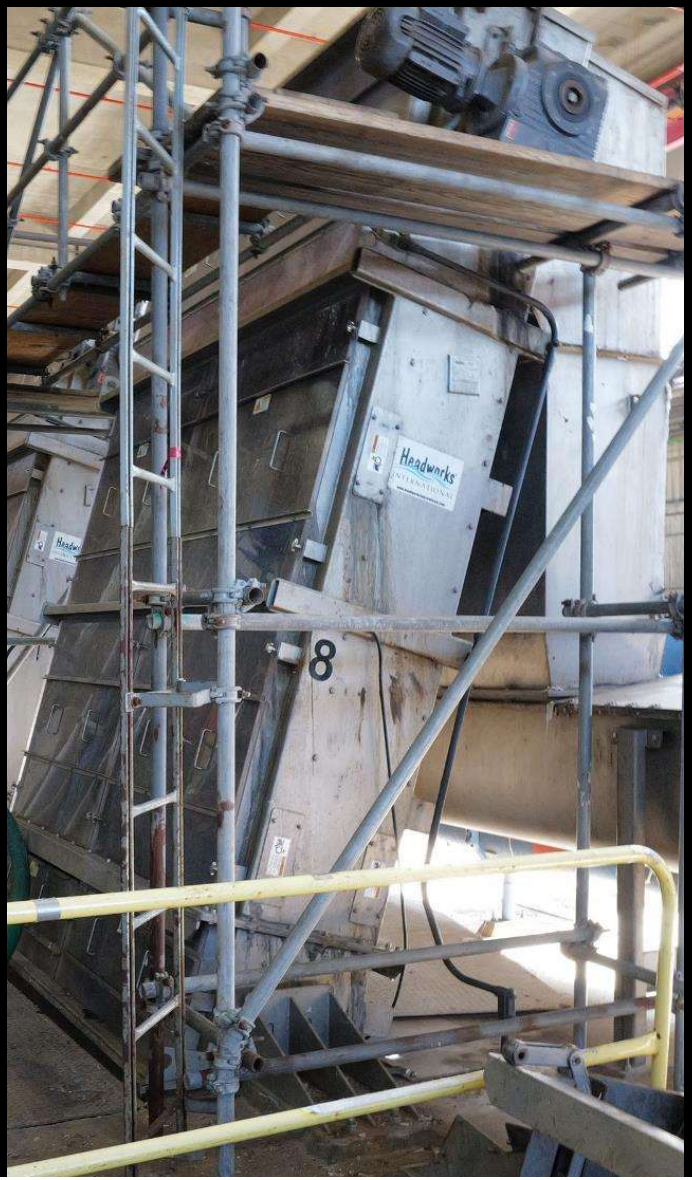
The tour started as a walking tour from the Learning Center and ended up driving up to the eastern edge of the plant, nearest El Segundo. The group walked by the primary clarifiers first, then to the head works, but the slides will be shown in the order of the flows through the plant. This is a sketch showing flows.



The tour included the bar screens to the primary clarifiers and then we boarded a van to drive to the plant's eastern boundary. The tour did not go to the aeration tanks and downstream processes (these processes generally do not produce odor) .

Here we see one of the bar screens. There are 8 parallel screens. The recommendations of the committee report included several improvements for monitoring in order to detect problems early before they cause damage or flooding.

Alarms in the building and video monitoring equipment have been installed. The digital control system was under construction during the time of the flood and it will be completed soon.



This slide shows the back of the bar screens. They are covered to reduce odors. During the worst of the flood, screenings covered the floor you see and it was approximately 2 ft underwater.

Bar screens are high-wear devices and require frequent maintenance and rebuilding. Here is one of the screens being rebuilt. It has been removed for access and you can see the notches that hold the bars.

This is one of our tour group inspecting the screenings flume. In the back ground, on the wall you can see one of the new video cameras (white band in the middle) . This is a critical point to transport screening out of the building and a failure of the type in 2021 could be seen here.

This slide shows one area of the primary clarifier covers. They are partially covered with removable panels and partially with fixed concrete covers. Primary clarifiers always have movable parts which require routine maintenance and therefore access. The primary clarifiers are operated under a partial vacuum so that odorous gases can be sucked through the large pipes to an odor control facility.

Here is a detail of the odorous gas piping. It extends around the plant. Buildings that have odor producing processes are always sealed up and connected to odor control piping.

The yellow hand rails protect an opening to the primary clarifiers for maintenance.

Areas that are opened for maintenance should always be covered. This protects the vacuum for the other parts of the plant. Here we see tarps used for temporary cover.

This slide shows the covers for the third and fourth batteries of primary clarifiers. The green hill on the right is the plant's border with the City of El Segundo. The removable aluminum covers lie flat on the deck. They are always removable at treatment plants to allow maintenance. The white pipes are to transport foul air.

This is a blow up of the covers. They are usually 2 to 3 ft wide and up to 20 ft long, depending on the plant. They need to be sealed at the edges to preserve vacuum.

Corrosion is a big problem in primary clarifiers. The next slide shows covers that have been removed and will be recycled

The odorous gases are transported to odor control towers. Here the gas is contacted with water containing chemicals that reactor with the odors to remove them. There are also towers that use activated carbon. Newer towers are using biomass to oxidize the odors.

Odor control is a continuing area of research. Hydrogen sulfide is the primary odor producing chemical but plants are discovering that after the hydrogen sulfide is removed there are still detectable odors.

Here are the old covers, piled up to be recycled.

This is a view, looking west, from the east side of the plant that boarders the City of El Segundo.

It gives you a feeling for the size of the plant, which is approximately 145 acres.

The towers are filled with packing that promotes contact between the gases and liquid. Packing takes different forms and shapes.

This is a view of the new H2S monitoring station.
There is an older monitoring station for weather

There were several questions that were discussed with the group at this time. One question is why to the odors seem to be greater at night? LA San staff replied that the wind directions change at night.

A comment I can make relates to the odor producing potential of the wastewater. The time of travel from homes and industries to the treatment plant is greater at night due to the lower flow rates. This provides more time to odors to be produced. Also people usually work away from their homes so they are not there during the day to observer odors.

I am hoping that we can correlate odor complaint and time of day to better understand their sources and how to reduce them.