



BOC Odor Reduction Program For Kiewit Infrastructure West

Magnolia Trunk Sewer Slip Lining Rehabilitation Project

This project consists of rehabilitating approximately 26,500 feet of pipeline, 30 manholes and a siphon facility in the cities of Fountain Valley, Westminster and Garden Grove, California. The purpose is to repair an aging pipe system and effectively serve the needs of the growing communities. Construction will extend along on Bushard Street in Fountain Valley, north of Ellis Avenue. Construction will continue west on Edinger Avenue in Westminster and move north on Magnolia Street to Westminster Blvd.

Project Status: May 2011

Construction of the Magnolia Trunk Sewer began in December 2010 with an estimated project completion date of Fall 2011.

Fountain Valley: Crews are currently working at various pits and manholes along Bushard Street. Pit 1, located just north of Toucan is now complete. Work at the intersection of Bushard and Warner is scheduled for completion in late May. The intersections of Bushard and Talbert/Slater, will be completed in early June.

Westminster: Construction along Magnolia between Westminster Avenue and Bishop Place has begun. Work at the intersection of Bolsa and Magnolia will be done at night to minimize impact to local businesses and commuters. Construction has also begun along Edinger and Magnolia.

The reline projects have been suffering from community odor complaints from H₂S gases emanating from the open trunk line construction pits.

Fiberglass Pipe Slip Lined Into Sewer Pipe

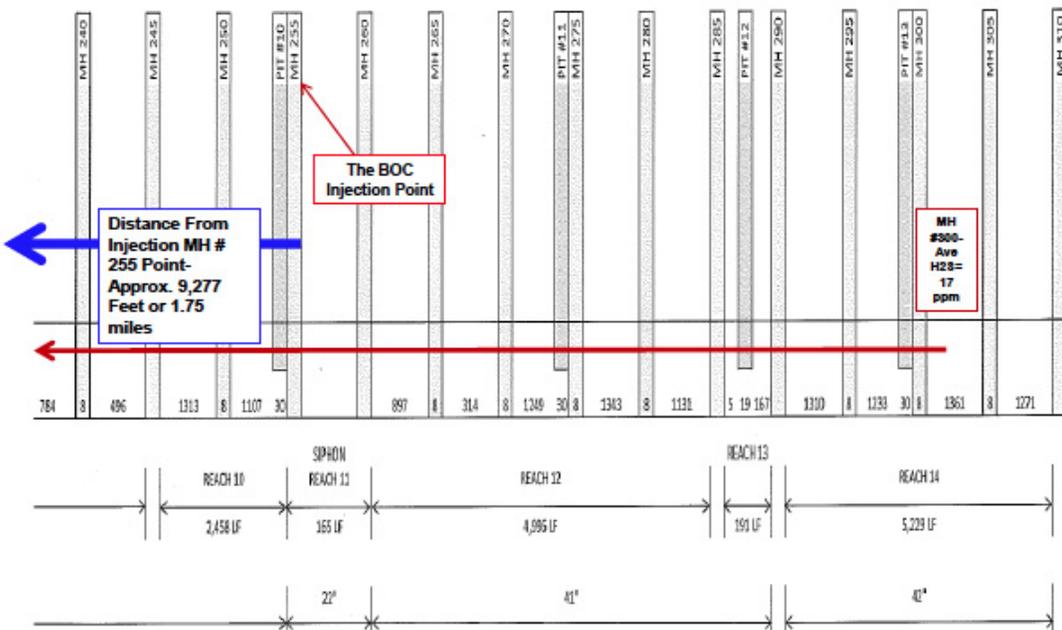
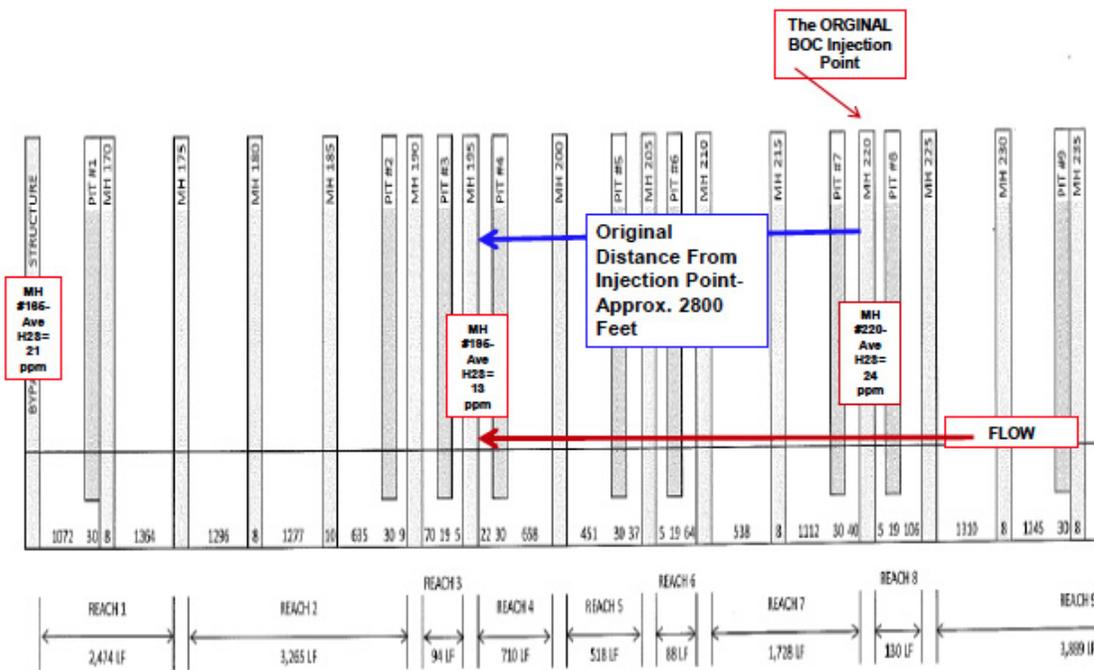


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The Objective: Reduce Odors in a Specific section of a Gravity Main

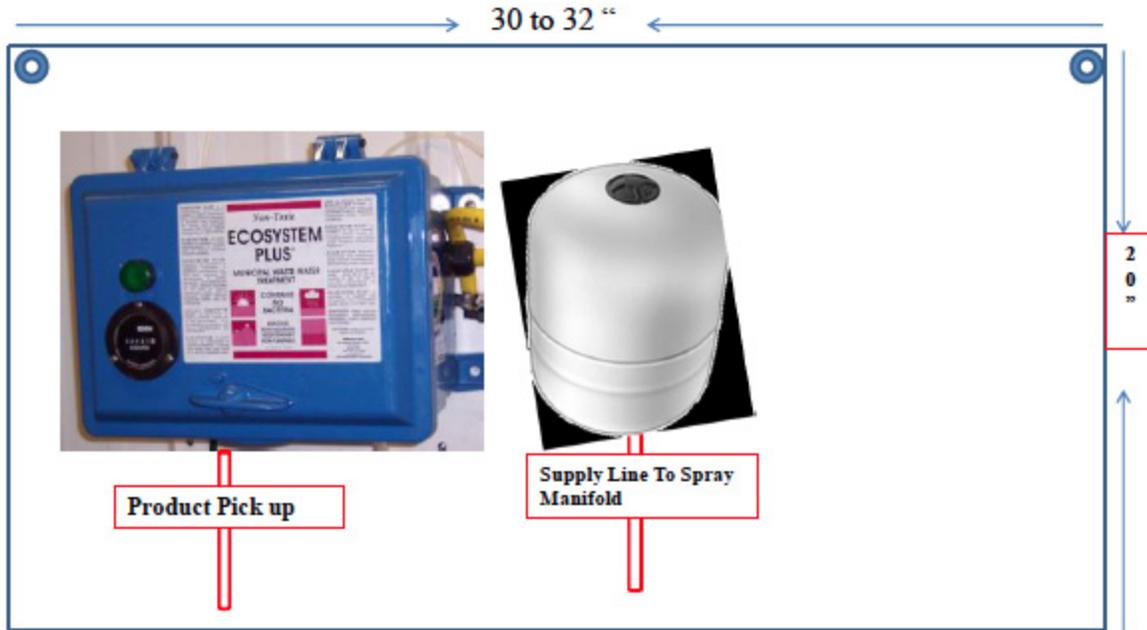
- 5 mile line, 48 inches Diameter, gravity main
 - Flow of 2-3 million gallons per day.
1. Install a odor control system for the reduction of H₂S to in the collection system/ pipe reline project.
 2. The injection point was to be in a remote location (manhole #220), in the middle of the Magnolia street. However, it is actual installed in MH 3255 ~1.75 miles upstream of MH#195 (Where H₂ monitoring is occurring)
 3. There is no availability of 120 VAC to power the pump of the BOC odor control system. The injection point is manhole #220,

Magnolia Trunk Sewage Project Layout



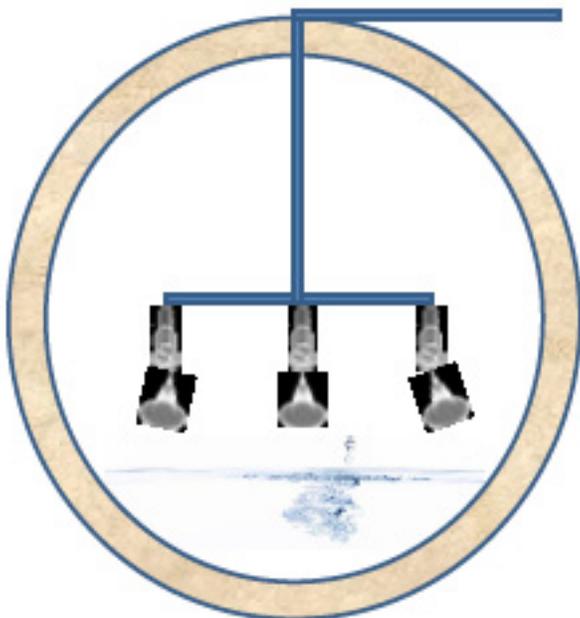
EcoSystem Plus Odor Control System

12 VDC Battery Operated Control Panel-60GPH Capacity Mounted On The Side of a 275 Gallon Tote Bin



General Spray Nozzle Concept - Misting and Fogging Nozzles

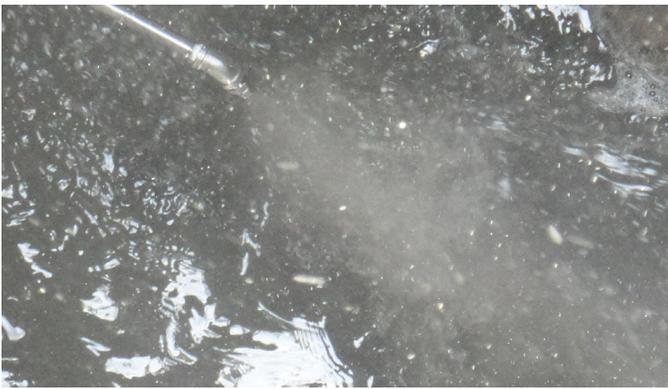
Providing the smallest atomized spray droplets of all of our spray nozzles, All nozzles are easy to clean and have a strainer. Strainer has a brass body with stainless steel 120×120 mesh. Spray angle is 80° for full cone spray nozzles; Maximum pressure is 500 psi. Maximum temperature is 180° F. Connection is NPT male.



1,000 Liter ESP Solution Tote Bin



Spray Nozzles In The Manhole # 255



BOC Application Rate

Actual 7 Day Application Rate Dased On Smallest Nozzle Size						
24 Hr Application Rate	Tote bin- Gallons	GPD- 24 Hrs	Spray Nozzle @ ~ 80 to 100 psi-GPH	GPH With 3 Nozzles	spray nozzles	Days Of Operation Before Tote Bin Replacement
	275	72.00	1.00	3.00	3	3.82
12 Hr Application Rate	Tote bin- Gallons	GPH-12 Hrs	Spray Nozzle @ ~ 80 to 100 psi-GPH	GPH With 3 Nozzles	spray nozzles	Days Of Operation Before Tote Bin Replacement
	275	36.00	1	3.00	3	7.64
Actual 7 Day Application Rate Dased On Larger Nozzle Size						
24 Hr Application Rate	Tote bin- Gallons	GPD- 24 Hrs	Spray Nozzle @ ~ 80 to 100 psi-GPH	GPH With 3 Nozzles	spray nozzles	Days Of Operation Before Tote Bin Replacement
	275	144.00	2.00	6.00	3	1.91
12 Hr Application Rate	Tote bin- Gallons	GPH-12 Hrs	Spray Nozzle @ ~ 80 to 100 psi-GPH	GPH With 3 Nozzles	spray nozzles	Days Of Operation Before Tote Bin Replacement
	275	72.00	2	6.00	3	3.82