

Coastal community wastewater treatment

Hilltop disposal and recharge field solves environmental and regulatory onsite treatment challenges.

By Dennis F. Hallahan, P.E.

Project

Community wastewater treatment system, Los Osos, Calif.

Participants

San Luis Obispo, Calif.

CDM Smith

WA Rasic Construction

Product application

Infiltrator Systems chambers provide effluent storage to accommodate peak flows and community growth while replenishing groundwater supplies.



Infiltrator Chambers installed in a trench system offer large volumes of storage to meet peak flow demands.

Los Osos, Calif., is a coastal community of approximately 15,000 people. The city has an urbanized core of small lots that for generations were served by individual onsite wastewater treatment systems. Over time, as the urban core density increased and the small lots and the number of systems per acre became too great, nitrogen pollution resulted. In addition, code-sized systems would not fit on the small lots and had far exceeded system design life.

In 1983, the Central Coast Regional Water Quality Control Board issued a Prohibition Zone for septic tank discharge. The resolution specified removal of septic tanks within the Prohibition Zone because of the septic tank density and the resulting high concentrations of nitrogen in the groundwater. Additionally, in 1989, a building moratorium was included within the resolution. To make matters worse, with groundwater pumping to meet the large-volume water demand for agricultural purposes, saltwater had started to intrude further inland.

The outdated systems, groundwater pollution, the Prohibition Zone, the building moratorium, and the saltwater intrusion catalyzed the community to look for new solutions for their wastewater treatment needs.

Originally, a new centralized wastewater treatment plant was proposed for Los Osos. Initial exploration of this revealed that in the case of Los Osos, the discharge for a centralized wastewater treatment system, which is typically to surface water, would have to be an ocean outfall. This raised concerns that this outfall could exacerbate the saltwater intrusion due to the absence of the recharge that the current

onsite systems were providing. Further feasibility studies of the ocean outfall option demonstrated that it would be cost prohibitive.

Years of heated meetings, numerous proposals, a recall election, bankruptcy, lawsuits, and a bill signed by the governor finally resulted in the proposal of a community wastewater treatment system.

Community wastewater treatment

The decision to select a community wastewater treatment system allowed Los Osos to meet the community's needs and regulatory challenges at a lower cost with more favorable environmental outcomes than the centralized sewerage option originally proposed. By providing final discharge of highly treated effluent subsurface to a large subsurface community disposal and recharge field, the community system would have the added benefit of replenishing the groundwater supply in the area, thereby helping to minimize the effects of saltwater intrusion.

The surrounding hills were evaluated as sites for the disposal system and an ideal site was located where deep, highly permeable, sandy soils were present. These soils could accommodate high loading rates and therefore reduce the amount of land required for the hillside disposal and recharge field.

System design features

The community wastewater treatment system design includes collection, conveyance, treatment, and recycled water reuse and has a capacity of 1.6 million gallons per day. This allows for future community growth. The system's conventional gravity collection



Construction of the disposal and recharge system was fast and efficient. As one crew excavates, another crew installs piping, followed by a crew installing the chambers.



The disposal field is located on a hill overlooking the bay and will provide much needed recharge to counteract saltwater intrusion.

system includes pump stations, which deliver effluent to the wastewater treatment plant. The plant utilizes membrane treatment technology to remove the nitrogen. Then, the treated effluent is pumped up to a hillside on which the large subsurface disposal and recharge system is constructed. The recharge system is located under a five-acre field that will remain as open space.

The disposal and recharge system utilizes approximately 20,000 linear feet of Infiltrator chambers, which offer storage to accommodate peak flows and provide an increase in surface area as compared with stone and pipe trenches. The chambers, installed in a series of trenches, also offer enhanced infiltrative surface area to return the treated effluent

back into the soil to replenish groundwater supplies. Specifying Infiltrator chambers also resulted in cost efficiencies including installation and labor cost savings due to the ease of the lightweight chamber installation as compared with stand-alone stone trenches.

Treated effluent pumped up to the recharge field system is distributed through pressurized piping within the trenches. The system is divided into separate zones installed with controls and valves, which rotate the dosing evenly through each zone. The system is also equipped with monitoring ports to make it easy to observe water-ponding heights. The final grade sheds surface water and the system is seeded and stabilized for erosion control. Other than occasional mowing and surface inspections, no other maintenance is required.

Installed in the summer of 2013, the disposal and recharge system was designed by CDM Smith of Walnut Creek, Calif., with design consultation from Infiltrator Systems. The installing contractor was WA Rasic Construction of Long Beach, Calif.

The new wastewater treatment plant is scheduled for installation in 2014 and plans are for it to be fully operational in 2015. The entire system will be owned and operated by San Luis Obispo County.

Conclusion

The decentralized wastewater treatment model is a sustainable infrastructure that yielded a positive treatment, water supply, and cost-savings solution for the community of Los Osos. The Los Osos coastal community wastewater treatment system design can accommodate large flows and offers the community the ability to grow over time. Because of the disposal field design, the system also provides the added benefit of groundwater recharge to counter the effects of saltwater intrusion to the area water supply.

Dennis Hallahan, P.E., technical director at Infiltrator Systems, has more than 25 years of experience with onsite wastewater treatment system design and construction. Currently, he is responsible for technology transfer between Infiltrator Systems and the regulatory and design communities and consults on product research and testing for universities and private consultants. He can be reached at dhallahan@infiltratorsystems.net.

FOLLOW THE LEADER

- [FACEBOOK.COM/ZWEIGWHITE](https://www.facebook.com/zweigwhite)
- [TWITTER.COM/ZWEIGWHITE](https://twitter.com/zweigwhite)
- [BLOG.ZWEIGWHITE.COM](http://blog.zweigwhite.com)
- [YOUTUBE.COM/ZWEIGWHITE](https://www.youtube.com/zweigwhite)
- [LINKEDIN.COM](https://www.linkedin.com/company/zweigwhite)
COMPANY SEARCH "ZWEIGWHITE"
- [PINTEREST.COM/ZWEIGWHITE](https://www.pinterest.com/zweigwhite)
- [ZWEIGWHITE.COM](http://zweigwhite.com)