



## Las Virgenes Municipal Water District...

providing potable water, recycled water,  
wastewater services and biosolids composting.



4232 Las Virgenes Road, Calabasas, CA 91302 ~ 818.251.2200 ~ [www.LVMWD.com](http://www.LVMWD.com)

# Commitment to Service

Every day, the employees and leadership at Las Virgenes Municipal Water District (LVMWD) ensure the delivery of safe, clean, dependable water and environmentally protective wastewater treatment services in a cost-effective manner. LVMWD provides services to the cities of Agoura Hills, Calabasas, Hidden Hills, Westlake Village and neighboring unincorporated areas of Los Angeles County.

Taking Nature's lead, LVMWD works to make the most of water resources by bringing water "full circle." After potable water is delivered to your home and used, the wastewater is collected and extensively treated to be beneficially used as recycled water for irrigation; the biosolids are then processed into "Class A - Exceptional Quality" garden compost.

## Services Provided

- Potable Water**
- Wastewater Service**
- Recycled Water**
- Biosolids Composting**

LVMWD's service area has no local source of drinking water; all supplies must be imported from Northern California through Metropolitan Water District of Southern California (MWD), one of the world's largest water wholesalers. Originating in the high Sierras, the water is transported more than 400 miles through the State Water Project's California Aqueduct entering the LVMWD service area at the east end of Calabasas. Water is then carried through the District in a system of more than 400 miles of water pipe. Reliable water service in our mountainous area is challenging, requiring 25 storage tanks and 24 pump stations to serve our customers.

About 20 percent of the potable water served to LVMWD customers is reused in our community to irrigate highway greenery, golf courses, school grounds and other public and commercial landscapes. This recycled water is produced through extensive treatment of wastewater and is delivered through 66 miles of water lines, three storage tanks, two reservoirs and four pumping stations.

LVMWD provides wastewater (sewer) services to most residents throughout its service area, with a system of 56 miles of trunk sewer lines (from 8-inches to 48-inches in diameter) and two lift stations which pump wastewater over the mountains to the treatment facility.

The final step in LVMWD's "full circle" of water reuse is biosolids composting. Solids remaining from the water reclamation process are treated to become a rich soil amendment. Similar to the product sold at garden stores, this high-grade soil amendment is distributed free for home use, each Saturday morning.

## LVMWD Facts and Figures

### Established

1958

### Governance

Five member board of directors, publicly elected by geographic division

### Service area

122 square miles

### Population Served

Approximately 75,000 residents of Agoura Hills, Calabasas, Hidden Hills, Westlake Village, and neighboring unincorporated Los Angeles County are served potable water. In addition, 30,000 sewer connections receive sanitation services, a combination of Triunfo Sanitation District and Las Virgenes Municipal Water District customers.

### Customer connections

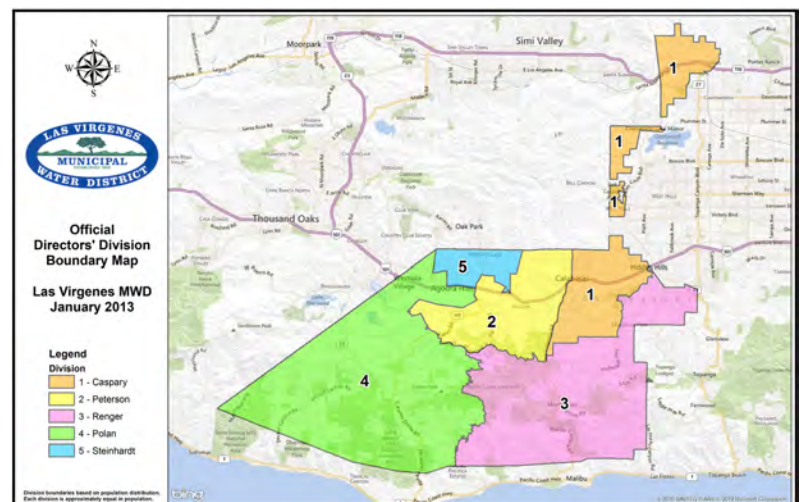
Potable Water	
Residential	18,299
Commercial	834
Recycled Water	643

### Water served 2014-15

Potable	22,196 acre feet
Recycled	4,344 acre feet

### Budget 2015-2016

\$68.3 million



# Facility Quick Facts

## Las Virgenes Reservoir

### Purpose

The reservoir is primarily used to meet peak summer water demand.

Can be used as a back-up water supply for emergency or planned service interruptions by MWD, providing up to three months of water for LVMWD customers.

### Location

City of Westlake Village, Los Angeles County.

### Size

Stores nearly 3 billion gallons of water.

Surface area – approximately 160 acres.

LVMWD owns nearly 360 acres of watershed land surrounding the reservoir.

### History

Designed and built from 1970 to 1972, filled by 1974.

### Features

Created by two earthen dams built on a bedrock foundation.

Main dam is 160 feet high, 2,000 feet long, 20 feet wide at the top, and 750 feet wide at the bottom.

Saddle dam is 50 feet high, 750 feet long, 20 feet wide at the top, and 425 feet wide at the bottom.

Inlet/outlet tower: A single concrete structure, with five inlet/outlet valves set at different depths. These valves allow the plant operator to draw water from varying levels in the reservoir.

## Westlake Filtration Plant

### Purpose

Necessary to disinfect and filter water from Las Virgenes Reservoir before it is served to customers.

### Location

At the Las Virgenes Reservoir in Westlake Village.

### History

Completed in 1990 at a cost of \$9 million to meet federal and state regulations for drinking water quality.

### Features

A 20,000 sq ft. facility capable of disinfecting and filtering up to 15 million gallons per day (gpd).

Uses 10 diatomaceous earth (DE) filters as the primary treatment process.

Disinfection is accomplished using chloramination.

## Tapia Water Reclamation Facility

### Purpose

Treats wastewater, transforming it into high quality recycled water.

Enables beneficial reuse of limited state water resources while reducing dependence on imported water.

### Location

Along Malibu Canyon Road in unincorporated Los Angeles County.

### History

Constructed at a low-point in the Malibu Creek watershed, allowing wastewater to flow by gravity to the treatment facility, reducing the need for pumps, infrastructure and energy use.

Built in 1965 with a capacity of 0.5 million gallons per day (mgd). Expanded in 1968 to a capacity of 2 mgd; 1972 to a capacity of 4 mgd; 1984 to a capacity of 8 mgd; 1986 to

a capacity of 10 mgd; the current capacity of 12 mgd.

Began water recycling in 1972.

### Features

Tapia currently treats an average of 8 million gallons of wastewater per day.

Six aeration tanks, each 160 feet by 30 feet and 15 feet deep, with 540 air injectors capable of adding 2100 cubic feet of air/minute.

Twelve filters for tertiary treatment, each with a surface area of 253 square feet and a four-foot-deep bed of anthracite coal over one foot of gravel.

An on-site, state-certified water quality laboratory, which ensures that recycled water leaving Tapia meets all state and federal health and safety requirements. The laboratory also monitors water quality in Malibu Creek, as part of the district's commitment to watershed stewardship.

## Rancho Composting Facility

### Purpose

Transform biosolid waste into U.S.EPA "Class A - Exceptional Quality" compost.

Provide long-term, environmentally beneficial disposal for biosolids removed from wastewater during treatment at Tapia.

### Location

Las Virgenes Road / Lost Hills Road in Calabasas, CA.

### History

Began operation in November 1994, as the first in-vessel composting facility in Los Angeles County.

### Capacity

Each year the compost facility saves enough landfill space to fill a football field to a height of one story.

Processes about 120,000 gallons of biosolids per day.

Produces approx. 11,000 cubic yards of compost annually.

Disposes of nearly all solids separated from wastewater at the Tapia Water Reclamation Facility.

### Features

One of the most advanced, automated biosolids composting facilities in the world.

Enclosed processing for efficient odor control.

Three anaerobic digesters; each 80 feet in diameter and 50 feet high.

Two centrifuges, each with a 250 gallon-per-minute capacity for dewatering.

One-half acre biofilter, which uses natural processes to control odors.



**Las Virgenes Reservoir provides LVMWD customers with an “insurance policy” against emergencies, temporary supply interruptions and water shortages.**

Located in the hills just south of Westlake Village, the reservoir can hold a three-month supply of treated drinking water for district customers. The total capacity is approximately 9,500 acre-feet. (An acre-foot equals 325,851 gallons, about enough water to serve two average families in and around their homes for one year.) The reservoir was created to assure reliable drinking water delivery to LVMWD customers during peak seasonal demand. The reservoir is also our “back-up” for scheduled shutdowns for maintenance, in times of drought, or in the event of earthquakes and other emergencies. Las Virgenes Reservoir played an important role after the 1994 Northridge Earthquake, when service from MWD was interrupted. Within hours, water

from the reservoir was flowing while residents in nearby communities were without water for as long as a week.

With only one source of drinking water serving our arid area, a local storage facility is critical. All drinking water served to LVMWD customers is imported because local water supplies are scarce and of poor quality. Supplies are purchased from the Metropolitan Water District of Southern California (MWD). This water originates as snowpack in the high Sierras and is transported more than 400 miles

through the State Water Project, which is owned and operated by the Department of Water Resources.

Water delivered and stored in Las Virgenes Reservoir is treated potable water from MWD. To help protect water quality, LVMWD owns 360 acres of land immediately surrounding the reservoir.

Water is drawn from the reservoir through a concrete tower with inlet and outlet valves located at five different depths, allowing operators to select the highest quality water to be pumped into the adjacent treatment plant.





## Westlake Filtration Plant adds a layer of safety to the water served from Las Virgenes Reservoir.

Potable water stored in the reservoir has been treated extensively by the MWD. However, once potable water has been in an open reservoir, whether previously treated or not, federal and state regulations require additional disinfection and filtration before it is served to customers.

Water from the reservoir is pumped to a concrete tank, called a raw water reservoir. It is then treated by ten filtration units using diatomaceous earth (or DE) as a filter media. DE consists of microscopic plant skeletons called “diatoms.” Each diatom has hundreds of jagged edges that interlock with other diatoms to form a tightly woven filter capable of “catching” extremely small materials. Harmless algae, which can cause taste and odor problems, is the primary material removed from reservoir water. The filtration plant’s process is mostly automated, but it can be manually operated if necessary.

Disinfection is accomplished using chloramines, which maintain the safety and

quality of water as it travels through the distribution system. Chloramine disinfection is preferred for water with organic materials present because it does not produce potentially harmful disinfection by-products.

Westlake Filtration Plant can process as much as 15 million gallons of drinking water per day. Water processed at the plant is tested regularly. It consistently meets or tests better than all state and federal drinking water standards.

Westlake Filtration Plant only operates when water is drawn from the reservoir in the summer months, when there are planned maintenance shutdowns by MWD or in the event of emergencies. The plant, however, is always in “standby mode” and can be on-line within hours. While in operation, the filtration plant is controlled by highly skilled treatment plant operators and a complex automated monitoring system, to ensure safe and consistent water quality.

*Filtration tanks use DE as filter media. These ten filters can process up to 15 mgd.*



## Tapia Water Reclamation Facility ~ Recycling Wastewater for Irrigation



**Tapia Water Reclamation Facility (TWRf) applies state-of-the-art technology to transform wastewater into high quality recycled water that is used to irrigate public and commercial landscaping such as golf courses, school grounds, highway medians and parks.**

Wastewater is potable water that has been used in a home or business. The water that goes down a drain enters the wastewater (sewer) collection system. The wastewater travels through a series of collection pipes in the LVMWD service area, traveling mainly by gravity to the TWRf.

Wastewater entering Tapia is 99% water and 1% solids and inert materials. The first step is to remove the inert materials. Larger items, like rags and paper, are removed by passing the waste stream through a vertical slatted bar screen. Finer materials (egg shells and coffee grounds) are removed in a "grit chamber." Here, the flow is slowed and air is injected to keep small, organic particles suspended while the heavier, inert materials fall to the bottom. The items removed from the wastewater to this point go to a landfill.

The wastewater is then pumped to the primary sedimentation tanks. Primary treatment is a separation process using gravity, where the solids in the wastewater are allowed to settle to the bottom of the tank. Oil and grease, which are lighter than water, float to the surface. Large paddles skim the water surface and the bottom of the tanks to remove these materials, which are pumped to the Rancho Las Virgenes Composting Facility.

Secondary treatment is a biological process. The wastewater flows to aeration tanks to be "cleaned up" by beneficial microorganisms. This is similar to the natural water-purification cycle, but is accomplished in less time. As in nature, microorganisms remove contaminants and clean the water as they feed, grow, and multiply. Oxygen is added by injecting air into the tanks, which helps speed the process.

The partially treated wastewater then flows to the secondary sedimentation tanks, where the microorganisms are allowed to settle out. They are collected and returned to the aeration tanks, to work on another batch of wastewater. Meanwhile, the liquid portion goes on to the next step, tertiary treatment.

Tertiary treatment is a filtration process designed to remove any remaining extremely small particles. Chemicals are added to "floculate", or clump the particles together, making them easier to filter out. The water is then disinfected with sodium hypochlorite. After sufficient "contact time" the sodium hypochlorite is "neutralized".

Tapia has a capacity to process up to 12 million gallons of wastewater per day, but currently averages about 8 million.

By recycling wastewater to stringent Title 22 standards, Tapia provides an additional "source" of water for our communities. About 20 percent of all the water delivered by LVMWD has been recycled for irrigation use. During the hot summer months, irrigation consumes all the recycled water Tapia produces, with the added benefit of reducing the demand for potable water by that same amount.

Also at Tapia, an on-site, state-certified water quality laboratory conducts testing to assure that all potable and recycled water served by LVMWD meets stringent state and federal health standards. The laboratory also monitors water quality in Malibu Creek, as part of the District's commitment to watershed stewardship.

### *Awards received by Tapia include:*

- U.S. Environmental Protection Agency Operations and Maintenance Excellence Award - 1988
- Statewide Plant of the Year - 1989, 1995
- Los Angeles Area Plant of the Year - 1972, 1974, 1983, 1985, 1994
- Association of California Water Agencies Environmental Achievement Award - 1989, 1995, 2003
- National Environmental Awards Council Outstanding Operations, Maintenance and Total Reuse

Tapia Water Reclamation Facility and Rancho Las Virgenes Composting Facility are operated under a Joint Powers Authority between LVMWD (located in western Los Angeles County) and Triunfo Sanitation District (located in eastern Ventura County). The two agencies provide wastewater service for some 100,000 residents over a 150 square mile area, as well as recycled water and biosolids composting.



**Rancho Las Virgenes Composting Facility ~  
Putting Wastewater By-products to Good Use**



**Rancho Las Virgenes Composting Facility provides for the beneficial reuse of biosolids removed during wastewater treatment at the Tapia Water Reclamation Facility, converting them to nutrient-rich soil amendment.**

Traditionally, options for biosolids disposal included landfills or trucking to agricultural areas to spread on land – both of which have become costly and limited due to public opposition and new regulations.

In service since 1994, Rancho Las Virgenes uses a composting process to transform biosolids into a useful, rich soil amendment. The biosolids are transported to Rancho from Tapia through four miles of underground pipelines.

Processing begins in three anaerobic digesters that provide a warm oxygen-free environment in which the natural decay process is accelerated, some of the harmful bacteria are neutralized, and odors are reduced. This process takes 20 to 30 days to complete.

The next step is to dewater the solids. As much as 75 percent of the remaining water is removed. Called “centrate”, this liquid is returned to Tapia to again be run through the treatment process. The remaining solids form a dense “cake”, which is mixed with ground wood chips or sawdust. The added texture helps air flow through the product and allows the composting process to take place.

Using in-vessel composting, the mixture is mechanically “churned” and moved along bays. During this period, helpful microbes feed on organic materials in the mix, raising the temperature to about 130°F. The heat stabilizes the material and further neutralizes potentially harmful bacteria which remain, while maintaining the right temperature for beneficial, “composting” microbes to do their work. Air is blown through the mixture to keep it from overheating and to provide oxygen to the microbes.

It takes 21 days for the mixture to travel the length of the processing bays. By the time it reaches the end, it has become a light and consistently textured compost. The mixture is allowed to “cure” for about 15 more days, at which time it is ready for distribution.

State and federal safety tests are conducted throughout the process and again on the finished compost, to assure it is ready for use and that it meets the stringent EPA standards for “Class A” garden compost, meeting all requirements for use on lawns and gardens, including vegetables grown for human consumption.

Free household supplies of Rancho Las Virgenes Compost are available for pickup. Bulk supplies can be arranged. For more detail visit [www.LVMWD.com](http://www.LVMWD.com).



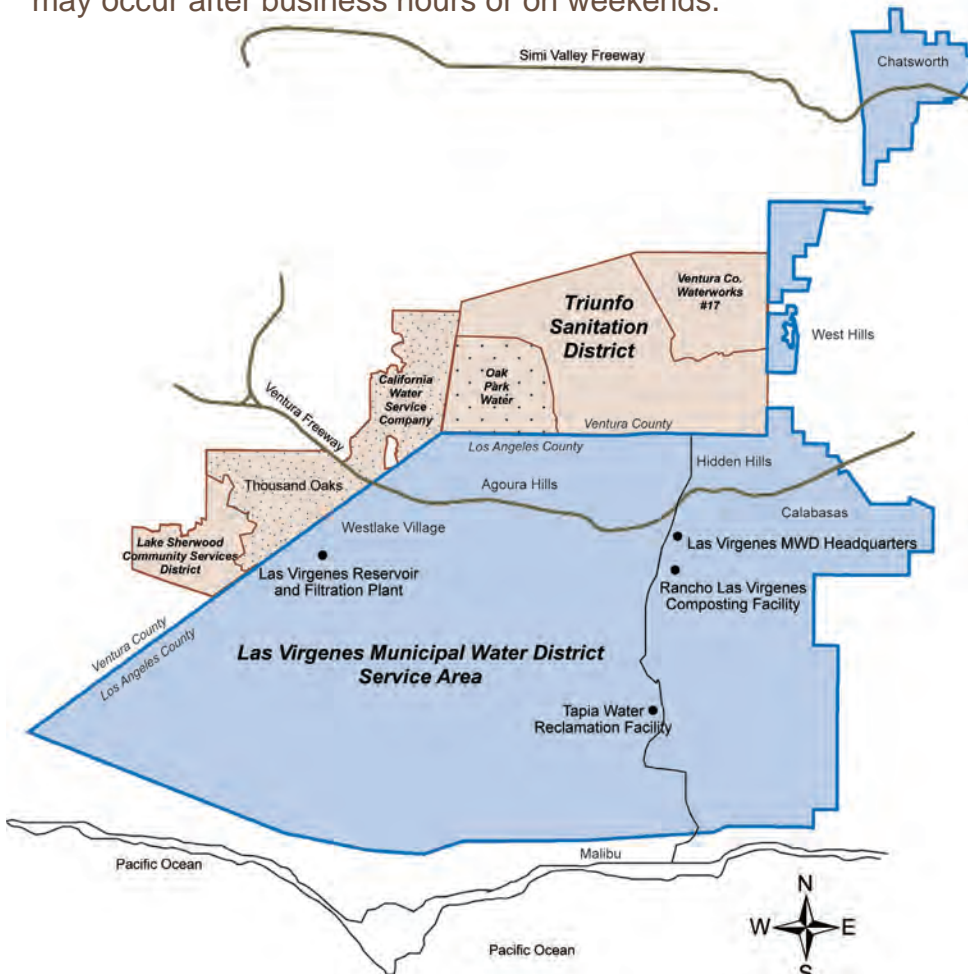
*Awards received by Rancho include:*

- L.A. area EPA Plant of the Year awards - 1995, 2003
- Excellence in Community Outreach for Compost and Biosolids processing
- US EPA Clean Water Act Recognition Award
  - Exemplary Biosolids Management
  - Public Acceptance Activities
- US Composting Council Member
- Rancho Las Virgenes is compliant with Seal of Testing Assurance Requirements

# Serving Our Community

LVMWD conservation programs can help customers save water with rebates for water-saving devices. We also help customers conserve water through landscaping workshops, low-flow shower heads, brochures on conservation practices and daily web site publication of plant irrigation needs. The District's award-winning educational programs include facility tours, in-class presentations, water awareness lesson plans, exhibits and demonstrations, water-themed in-school plays, and books on water topics donated to local libraries.

Customer service is available 24 hours a day for emergencies that may occur after business hours or on weekends.



## Facility Tours

Tours of the facilities described in this publication are offered to the public quarterly.

If you are interested in finding out where your drinking water comes from, or how wastewater is recycled, you can find the answers and more during one of these FREE educational and entertaining quarterly tours.

Tours include a chance to meet other residents, a presentation on current water issues, on-site visits to our facilities, and a question and answer period.

Register on-line at [www.LVMWD.com](http://www.LVMWD.com), or call 818.251.2200 during business hours.

## Las Virgenes Municipal Water District Board of Directors

### Division 1

Charles Caspary, Secretary

### Division 2

Glen Peterson, President &  
MWD Representative

### Division 3

Lee Renger, Vice President

### Division 4

Leonard E. Polan, Directory

### Division 5

Jay Lewitt, Treasurer

### General Manager

David W. Pedersen, P. E.

### District Counsel

Wayne K. Lemieux

You may direct communications to  
LVMWD Board members by sending  
an e-mail to:  
[board@lvmwd.com](mailto:board@lvmwd.com)

Board meetings are scheduled at  
5 p.m. on the second and fourth  
Tuesday of each month.

Las Virgenes - Triunfo JPA meets first  
Monday of the month at 5 p.m.

Check the website for meeting and  
agenda information.

Customer Service -  
818.251.2200

After hours emergency -  
818.251.2100

Construction & Drought Hotline -  
818.251.2180

[StopTheWaste@LVMWD.com](mailto:StopTheWaste@LVMWD.com)

Rancho Las Virgenes  
Composting Facility

**Free Compost Pickup  
Saturdays 8 a.m. to 1 p.m.**

Rebate Information  
[www.LVMWD.com](http://www.LVMWD.com) ~ Conservation

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Recycled Water  
Wastewater Treatment  
Biosolids Composting



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