

9 Demand Management Measures

CWC 10631(e)

Provide a description of the supplier's water demand management measures. This description shall include...a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.

This section briefly overviews VWD's conservation programs and their history. The section then discusses the urban water conservation Best Management Practices (BMPs) as proposed by the California Urban Water Conservation Council (CUWCC) and VWD's compliance strategies for these BMPs. CUWCC is now known as the California Water Efficiency Partnership (CalWEP).

9.1 Demand Management Measures for Retail Agencies

During the past few decades, conservation has become a vital part of VWD's overall reliability strategy. This is like its water wholesaler, the SDCWA, which has projected that conservation will account for 11 percent of its water diversification strategy for 2011 and increase to 17 percent by 2020. With a similar vested interest in water savings, VWD, as well as the other 24 member agencies of the SDCWA and the MWD, collaborate on programs that benefit the entire region. The combined effort has yielded increased conservation and water knowledge through education, messaging, and financial incentives for water-efficient devices.

VWD started a water conservation program in 1975, and with the support of the Board of Directors, the program expanded significantly during the drought of 1976-77. At the program's inception, efforts steered toward a long-term public information program and active cooperation with regional water conservation programs of the SDCWA. Though the drought ended, many of the programs that emerged during that time remained focused on switching from an "emergency situation" agenda to a long-term public information effort aimed at outreach in wise water management.

Through the addition of a Water Conservation Supervisor and Resources Assistant, the framework of a long-term conservation program continued to serve as a backdrop for the next major drought of 1987-1992. With the additional staff and a clear understanding of the importance of conservation, VWD aggressively revamped the conservation program and developed a variety of innovative and effective approaches to demand management. VWD reaffirmed its commitment to conservation and became one of the original signatories to the "Memorandum of Understanding Regarding Urban Water Conservation" in California on September 16, 1991. The CUWCC (now CalWEP), of which VWD is a long-time member, emerged from the Memorandum of Understanding, as well as urban water conservation practices known as the BMPs, which are aimed at reducing California's long-term urban water demands.

To assist in achieving goals set by CalWEP, the structure of VWD's conservation department was later changed to include a Public Information/Conservation Supervisor

and 2.75 Public Information Representatives (with the part time position dedicated to social media).

As conservation and public information go hand in hand, all members of the conservation department now have the responsibility for water conservation programs and related outreach. This proved to be extremely valuable in 2015 during state-mandated drought restrictions. On May 5, 2015, the state adopted new regulations and mandated a 24 percent reduction in potable water use for Vallecitos from 2013 demands. On March 9, 2016, the SWRCB changed Vallecitos' water conservation target to 16 percent due to VWD's direct connection to the seawater desalination plant in Carlsbad. Since the mandate, Vallecitos has achieved a 25.6 percent water conservation reduction.

9.1.1 Water Waste Prevention Ordinances

For compliance, VWD had adopted Ordinances No. 162 and 195, which are included in Appendix H for reference. Ordinance 162 was patterned after the conservation actions of its water wholesaler (SDCWA) and establishes regulations to be implemented during times of declared water shortages or emergencies to conserve water. The VWD WSCP revised and established six standard levels of drought response with corresponding actions to be implemented in times of shortage or emergency, with increasing restriction on water use in response to worsening drought or emergency conditions and decreasing available supplies.

- **Level 1 – Drought Watch:** With this alert, VWD will increase public outreach and take action to encourage voluntary conservation practices.
- **Level 2 – Drought Alert:** With this alert, VWD will implement mandatory conservation practices to reduce water use by up to 20 percent. These practices include limiting landscape irrigation and repairing leaks within 5 days of notification.
- **Level 3 – Drought Alert:** With this alert, VWD will implement mandatory conservation practices to reduce water use by up to 30 percent. These practices include additional limitations on landscape irrigation and repairing leaks within 4 days of notification.
- **Level 4 – Drought Critical:** With this alert, VWD will implement mandatory conservation practices to reduce water use by up to 40 percent. Additional conservation practices include the prohibition of filling pools or fountains and washing vehicles and require repair of leaks within 72 hours of notification. With minor exceptions, no new potable water annexations will be allowed during a Level 4 Drought condition.
- **Level 5 – Drought Critical:** With this alert, VWD will implement mandatory conservation practices to reduce water use by up to 50 percent. Additional conservation practices include prohibition on outdoor landscape irrigation, the prohibition of filling pools or fountains and washing vehicles and require repair of leaks within 48 hours of notification. With minor exceptions, no new potable water services will be allowed during a Level 5 drought condition.
- **Level 6 – Drought Emergency:** With this alert, VWD will implement mandatory conservation practices to reduce water use above 50 percent for VWD to have adequate supplies to meet anticipated demands. Additional conservation practices

include prohibited landscape irrigation, excluding commercial growers or nurseries, and the repair of leaks within 24 hours of notification.

Table 8-1 provides a summary of the conservation practices required at the six stages of drought conditions.

Ordinance 195 was previously implemented in response to Governor Brown's issued Executive Order No. B-29-15, directing that the SWRCB develop and impose restrictions on urban water users to achieve a statewide 25 percent reduction in potable urban water use.

9.1.2 Metering

Some of the requirements associated with meeting this BMP are including meters for all new service connections; establishing a program to retrofit existing unmetered connections; reading meters and billing customers by volume of use; billing intervals of no greater than bi-monthly; performing at least five meter readings for every 12-month period; and preparing a written plan that includes a census of all meters by size, type, year installed, and customers served. Also included are barrier identifications to retrofitting mixed commercial accounts with dedicated meters and conducting feasibility studies to assess the merits of a program to provide incentives to switch mixed-use accounts dedicated to irrigation meters.

Metering of all water use and billing by volume has long been the standard practice at VWD. As directed by the BMP, all new and existing water service connections are metered. For large parcels and commercial developments, separate, dedicated irrigation meters are placed where needed. Customers are billed based on monthly reads and according to "Tier Ranges" adopted by VWD on July 1, 2003. The Tier Ranges are divided into four step pricing tiers with separate use requirements for residential, irrigation, agriculture, and commercial/industrial, in an effort to promote conservation by charging a higher rate for each incremental use of water.

The District currently uses Automated Meter Reading. A sending device (MXU) in each meter box transmits a read to a Vehicle Gateway Base-station in the truck of a meter reader. Routes are uploaded to the Vehicle Gateway Base-station, read by driving through a neighborhood, and then downloaded into the District's billing system.

The District currently specifies Omni and iPerl meters for new development and replacement of old meters. These meters store 30 days of 10-minute interval reads. If a customer is concerned about a high usage read or suspects a leak, meter department staff can download the 30 days of water usage with a portable device known as a UniPro to discern usage behavior patterns, distinguish irrigation from domestic use, and collaborate evidence of a leak. There are currently 365 iPerl meters and 150 Omni meters installed in the District.

The next evolution in meter reading technology is Advanced Metering Infrastructure. The District currently specifies Sensus meters (iPerls and Omnis) for new construction and employs Sensus Automated Meter Reading technology. Implementation of Sensus Advanced Metering Infrastructure would cost approximately \$5.3 million.

9.1.3 Conservation Pricing

This BMP promotes water conserving retail water rate structures. When creating a rate case, professional judgments are made to determine whether costs are accounted to a variable or fixed cost center by the staff of the agency. The final water rate case is an accumulation of all the decisions and judgments made by staff and supplemented by the financial projections leading an agency to establish its final water rate recommendation. The BMP is not intended to supplant this process, but rather to reinforce the need for water agencies to establish a strong nexus between volume-related system costs and volumetric commodity rates.

VWD customers are billed based on monthly reads and according to “Tier Ranges.” The “Tier Ranges” are divided into three step pricing tiers with separate use requirements for residential, irrigation, agriculture, and commercial/industrial. This is an effort to meet this BMP and promote conservation and wise water use by charging a higher rate for each incremental use of water. Commodity charges are currently approximately 66 percent of the revenue generated by water rates. Drought conditions have exacerbated the percentage.

9.1.4 Public Education and Outreach

The primary basis for this BMP is to use public information programs as an effective tool to inform customers about the need for water conservation and ways they can conserve, and to influence customer behavior to conserve. The program should include, when possible, but should not be limited to, providing speakers to employees, creating social marketing elements that are designed to change attitudes to influence behavior; using paid and public service advertising; using bill inserts; providing information on customers’ bills showing use for the last billing period compared to the same period the year before; providing public information to promote water conservation measures and shaping water conservation messages; training stakeholders outside the utility staff in water conservation priorities and techniques and coordinating with other government agencies, industry groups, public interest groups and the media.

Through a dedicated staff, VWD meets this BMP requirement through a variety of programs and strategically targeted communication. This includes internal and external, in-house produced periodicals such as a quarterly “Splash!” newsletter mailed to all customers, use of VWD’s website located at www.vwd.org, a Speaker’s Bureau covering a range of topics, and an employee newsletter. Also critical to outreach success are visibility at community events, press releases, brochures, paid newspaper advertisements, bill inserts and bill messages, free water-wise workshops, promotional events, displays, open house events, the Lending Library, classroom presentations, field trips for area schools, and facility tours. Some specific recent examples include banners at local schools, paid newspaper advertisements, and bill messages to remind people to conserve during the drought, school presentations covering water history and demonstrating water conservation techniques, as well as conservation advice available online at VWD’s website. VWD has also started using other forms of communications such as automated phone calls, movie theater ads, and social networking sites such as Facebook. The recently installed sustainable demonstration garden is another avenue that opens communication dialogue with customers to discuss ways to reduce outdoor water use.

VWD's outreach is directed to reach the diverse social, cultural, and economic elements of the population within the service area. This is accomplished by mailing the quarterly newsletter to all residents within our service area, instead of limiting distribution to actual water customers. Brochures, envelope snipes, and bill inserts are periodically mailed to VWD customers informing them of current water conditions. To assist our Spanish speaking customers, many of VWD's outreach materials are printed in Spanish and VWD's website contains a link that can convert the website text into Spanish.

The school outreach portion of this BMP has been established for water agencies to reach younger water users at an early age and enforce the need to engage in water conservation as a life-long behavior. Some targets associated with achieving success include implementing a school education program to promote water conservation and water conservation-related benefits through instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Educational materials shall meet the state education framework requirements and grade-appropriate materials shall be distributed. Also, when mutually beneficial, the water wholesale agency may operate all or part of the education program. For such cases it may be beneficial for the retail agency to assume responsibility for CUWCC reporting of this BMP; under this arrangement, a water wholesale agency may aggregate all or portions of the reporting and coverage requirements of the retail agencies joining into the mutual consent.

The VWD Education Program is designed to meet BMP requirements and establish standards adopted by the California State Board of Education in October 1998. Implemented in conjunction with the SDCWA, the presentations are designed to increase water knowledge among VWD's most impressionable users. The VWD Education Program includes:

- **Kindergarten** – In-class presentation to bring the science of the water cycle together with an effort to personalize the student's scientific knowledge of the role of water.
- **First Grade** – In-class presentation to help students comprehend the role of water in essential industries and introduce water conservation.
- **Second Grade** – Through a partnership with the City of San Marcos, VWD covers the cost to transport students to Jack's Pond Park and Nature Center where they are exposed to nature by having hands-on time with native plant exhibits. They also listen to a presentation on the importance of water in the ecosystem and the development of human settlements.
- **Fourth Grade** – In-class presentation and "water awareness calendar" poster contest to deepen the student's understanding of the water cycle.
- **Fifth Grade** – Field trips for fifth grade classes where students learn about water conservation, water treatment, the water conservation garden, and wastewater collections.
- **Kindergarten through Fifth Grade** – VWD covers the cost for the San Diego County Office of Education's "Green Machine" to be brought directly to the classroom. This hands-on agricultural program teaches the students about how

they get their food and explores the journey from “seed to table” by explaining soil science, integrated pest management, and the water cycle.

- **Fourth through Sixth Grade** – VWD covers the cost for the “Splash Science Mobile Lab” to make visits to area schools. This self-contained mobile laboratory is offered through the San Diego County Office of Education. It provides a hands-on experience where students learn about water by using cooperative learning skills, microscopes with live specimens, chemistry experiments, and state-of-the-art computers.

VWD has also partnered with the City of San Marcos to help create a conservation barn at Jack’s Pond Park to educate fourth through sixth grade students on various environmental topics. Inside the barn are seven rooms—each with a specific educational theme such as wildlife and habitat, native plants, and the water cycle. There are also many hands-on displays such as microscopes for examining life in the pond and an interactive wastewater treatment plant model.

- **Seventh through Twelfth Grade** – VWD outreaches to older students in a variety of ways, including:
 - In-class presentations on requested topics for middle schools and high schools.
 - VWD covers the cost to transport students to VWD’s MRF for facility tours to learn about wastewater treatment and recycling.
 - VWD participates in the San Marcos Unified School District’s annual Future Fair by setting up a booth to discuss water issues with the high school students.
 - Throughout the year, VWD partners with local schools on a variety of special projects. As an example, in 2015 VWD provided plants for students to install to create a native plant demonstration garden at Alvin Dunn Elementary School.
 - In-class presentations are currently under development for high school students, such as “Careers in the Water Industry,” “Cost of Water,” “Water Bill of Rights,” and the classroom activity, “Value of Water.”
- **Private Schools** – Smaller private schools and home schools within VWD’s service area are each invited to a special 2-day Splash Science Mobile Lab event at Jack’s Pond Park. The City of San Marcos’ Jack’s Pond Park and Nature Center is opened in conjunction with the Splash Science Mobile Lab event, and the Nature Center’s Director offers nature walks discussing storm water issues, local flora and fauna, and water allocation topics.
- **Colleges** – Although not a requirement of this BMP, VWD also works with local colleges to help educate students about the importance of water conservation. VWD participates in an annual environmental fair at Palomar College, and in 2010, VWD partnered with the college to create the sustainable demonstration garden that now graces the front of VWD’s administration building. VWD also currently serves on Palomar College’s “Water Technical Advisory Board.” Environmental architecture and design students designed the garden, which includes native plants, and a 2,500-gallon-capacity rainwater collection system that supplies water

to solar-powered ornamental water features. One of the water features includes a casted bronze hand depicting the value of water, which was created by Palomar College's sculpture and foundry departments. VWD also partnered with California State University San Marcos on two significant projects: a three-part Community Forum Series – "Fresh Perspectives on California's Water Future" as well as a Certificate in Water Resources Management and Leadership.

9.1.5 Programs to Assess and Manage Distribution System Real Loss

The goals of modern water loss control methods include both an increase in water use efficiency in the utility operations and proper economic valuation of water losses to support water loss control activities. Agencies are expected to use the AWWA Free Water Audit Software to complete their standard water audit and water balance. Instrumental to VWD complying with this BMP is a host of programs targeted at averting unbilled water loss before they happen. These programs include:

- **Water Audits:** Monthly water audits that compare total water sales with water acquisitions to determine the amount of unaccounted water. Regular audits allow VWD to develop new programs to enhance water loss reduction as needed.
- **Leak Detection:** VWD's distribution system is constantly monitored for leaks by a centralized control system, electric leak detection devices, and visual inspections.
- **Water System Improvements:** A state-of-the-art telemetry room uses a computerized Supervisory Control and Data Acquisition System to monitor water flow more efficiently. Routine and preventative maintenance is performed on the entire delivery system.
- **Meter Maintenance and Replacement Program:** Meters within VWD are replaced every 15 years to prevent malfunction and leakage.
- **Prosecution for Water Theft:** VWD personnel continually monitor for water theft and prosecute as necessary.
- **Water Loss Billing:** Whenever possible, the parties responsible for water loss (for example, damaged fire hydrants, dig-ins, etc.) are billed for the cost of required repairs and for all water lost.

A copy of the District's AWWA Water Audit is included as Appendix E.

9.1.6 Water Conservation Program Coordination and Staffing Support

The Water Conservation Department is managed by Chris Robbins, Water Conservation/Public Information Supervisor, who has over 21 years in the water conservation field. Staffing for the Department is 2.75 full time employees with a budget of nearly half a million dollars. Mr. Robbins can be reached at (760) 744-0460 ext. 314 or at crobbsins@vwd.org.

9.2 Other Demand Management Measures

To address the need for water conservation in the face of projected droughts and potential state-mandated water-use restrictions, VWD developed an outreach plan that targets its high usage customers. Rather than expending efforts on achieving usage reductions across all its customers, the District focused the HURL Program on those customers who have the highest usage patterns.

9.2.1 HURL Objectives

- Implement an outreach campaign for high use customers with greatest conservation potential.
- Focus special efforts on customers with high potential for water waste.
- Evaluate conservation results.

HURL Data Analysis

After developing objectives, the District needed to perform an analysis of its highest water using customers. This was accomplished using the following parameters:

- Tier 4 (highest level within the District) customers were queried by a finance analyst.
- March 2014 to February 2015 usage was evaluated in relation to the Tier 4 Limit.
- Customers were ranked by highest usage in relation to meter size with a higher weighting for recent months.
- Sent initial letters by customer category (starting with single-family residential).
- Made follow-up phone calls.

Letters

The HURL letter was designed to solicit the homeowners' assistance in achieving the 24 percent reduction. It made suggestions on ways to save water while reinforcing Governor Brown's mandate. To date, over 420 HURL letters have been issued to District customers.

Phone Calls

A phone bank effort was made during the evening hours (to reach more customers) the last week of April 2015. A phone script was developed to ensure that all staff followed a similar dialogue when engaging customers. Subsequently, staff have made HURL calls to customers based on updated data extracts on a case-by-case basis.

Results

District customers achieved 33.8 percent conservation in June 2015 and 37.8 percent in July 2015, significantly exceeding the District's mandated target of 24 percent.

9.3 Implementation over the Past Five Years

Demand management measures have been implemented per Sections 9.1.1 through 9.1.6. Additional demand management measures not covered under those sections include residential, commercial and landscape BMPs as follows:

9.3.1 BMP Category 3: Residential

Residential water users throughout California depend on a reliable and safe supply of water for their homes. This BMP is designed to establish the best and most proven water conservation methods and measures that residents, working in conjunction with water agencies, can implement. The practices encourage homeowners, multi-family property owners, and tenants to increase water use efficiency and reliability. As required by the BMP, retail water agencies implement water-use efficiency through residential assistance programs such as landscape surveys and water-efficient appliance and fixture rebates and incentives.¹

In meeting this BMP, VWD participates in a free water audit program to encourage water savings. As 50 to 70 percent of the water used in San Diego County is used on landscaping, customers can see significant savings by having an audit performed on their property. Audits assist customers by offering instrumental ways to save water in their own homes by reviewing landscaping irrigation systems as well as inspecting indoor and outdoor plumbing fixtures for leaks. VWD staff may suggest outdoor irrigation adjustments according to season and soil moisture composition, as well as recommend proper lawn maintenance and tips on low water-use landscaping. Once complete, an educational packet with information about other water conservation programs is also offered. Also available for distribution are free faucet aerators, low-flow showerheads, and booklets outlining effective irrigation practices, drought-tolerant plant selections, and simple tips to reduce water waste indoors and outdoors.

To further encourage customers to reduce outdoor water use, VWD participates in a regional landscape contest to award customers whose yards best exhibit the beauty of low-water gardening. Contest winners receive a gift certificate to a local nursery and are recognized at an award ceremony or at a VWD board meeting.

9.3.2 BMP Category 4: Commercial, Industrial, and Institutional

Commercial, industrial, and institutional (CII) usage makes up a large percentage of total water demand for California. CII water use varies dramatically between business sectors within a water agency's territory. The goal is to implement comprehensive yet flexible BMPs, allowing each water agency to tailor the implementation of each practice to fit local needs and opportunities. The end result is a practice that is successful and will produce the greatest amount of cost-effective water savings.

Through collaboration with SDCWA's CII Program, VWD meets BMP Category 4 requirements through a rebate program¹ that offers CII customers financial incentives to migrate to water-efficient equipment. Participants also benefit long term, experiencing savings in water, wastewater, and energy costs. VWD's CII offerings have included partial

¹ Rebates and incentives are dependent on funding by VWD's wholesalers (SDCWA and MWD).

reimbursement for pre-rinse spray valves, ultra-low flush toilets, urinals (waterless models included), water brooms, single-load high-efficiency washers, cooling tower conductivity controllers, multi-load high-efficiency washers, and weather-based irrigation controllers. The CII program is regularly promoted through VWD's website, mailings, bill inserts, letters, display ads, articles, and newsletters.

9.3.3 BMP Category 5: Landscape

Irrigation accounts for a large portion of urban water use in California. This water use varies dramatically depending on water pricing and availability, plant choice, geographic locations, seasonal conditions, and the level of commitment to sound water efficiency practices. The goal of this BMP is that irrigators, with assistance from the water agency, will achieve a higher level of water use efficiency consistent with the actual irrigation needs of the plant materials. Reaching this goal would reduce overall demands for water, reduce demands during the peak summer months, and still result in a healthy and vibrant landscape for California.

VWD meets this BMP with its own in-house audit program and a partnership with the Mission Resource Conservation District to provide audits at no charge to VWD customers. For small residential or commercial properties, VWD has the flexibility to use in-house certified landscape irrigation auditors who can conduct the landscape audits or contract staff. On larger properties, such as homeowners' associations or agricultural users, Mission Resources Conservation District is hired to conduct a more extensive audit.

Regardless of the size of the property, all audits include a face-to-face meeting where a walkthrough is performed to identify plant types, irrigation system design, equipment problems, and scheduling. This is completed with the goal of providing cost-effective opportunities at the property – from simple repairs to new ways to schedule irrigation. On large property audits, the audit concludes with a detailed report of graphs and charts showing a sample of the landscaped area, plant material identification, hydrazoning, weather data, and water savings potential.

9.4 Planned Implementation to Achieve Water use Targets

The actual per capita daily water use for the 2020 was 125 gpcd, which is below the 2020 target, as shown in Section 5. The current water conservation goals have effectively provided the reduction necessary to comply with SB7. Demand management measures delineated in Section 9 present VWD's plan to maintain conservation to ensure that the demands do not increase again if drought alert levels are decreased and water awareness wanes.

9.5 Members of the CalWEP

VWD is currently a member of the CalWEP.