

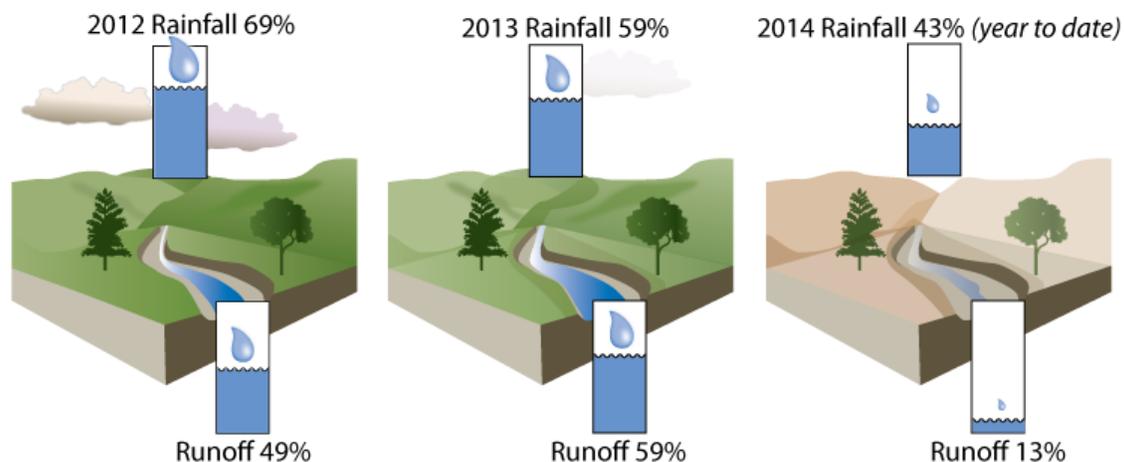
Attachment 2: Drought Impacts

Regional Water Management Impacts Due to the Drought

The Santa Cruz Region is completely dependent on local water supplies, recharged by winter rains. No water is imported from outside the region. Even before the drought, the combination of environmental and domestic water needs exceeded available supplies and/or storage in a significant part of the region. Local agencies have a long history of working together to address this issue, and the drought has accelerated these integrated efforts.

Santa Cruz County is among the most drought-impacted counties in California after three dry years in a row, shown in the graphic below, and is identified as an area of Exceptional Drought (D4) by the US Drought Monitor. With the water year concluding on June 30, just 13.55 inches of rain fell, exceeding the previous record of 13.88 inches set in 1976. Year to date rainfall is approximately 43% of the normal annual average total of 31.35 inches per year.

3 Dry Years



The regional water management impacts are already severe. Drought conditions have produced declining groundwater levels in numerous wells and shortages of water in Loch Lomond Reservoir, the San Lorenzo River and coastal streams, creating water emergencies and imperiling coastal salmon and steelhead runs. Loch Lomond Reservoir is 65% of capacity as of February 2015, and available surface water is 13% of average as the San Lorenzo River and North Coast stream flows are at historic lows. These sources form more than 90% of the City of Santa Cruz's (City) supply. Both project proponents, the City and Scotts Valley Water District (SVWD) use groundwater sources recharged by runoff from rainfall in the upper watersheds. In response to reduced supplies,, most water management agencies in the region have declared water emergencies, and all have implemented mandatory or voluntary cutbacks.

Anticipated Impacts If the Drought Continues

A Water Shortage Contingency Plan, updated in 2009, outlines drought related actions for the City. The goal of the City in implementing Stage 3 Water Emergency curtailments is to keep a carryover supply in Loch Lomond as a hedge against a subsequent dry year. Loch Lomond Reservoir is currently at 65% of capacity and projected to drop to 45% by October 2014, even

with curtailments, if the drought persists. If that were to happen, it is likely the City would declare a Stage 4 Severe Water Emergency.

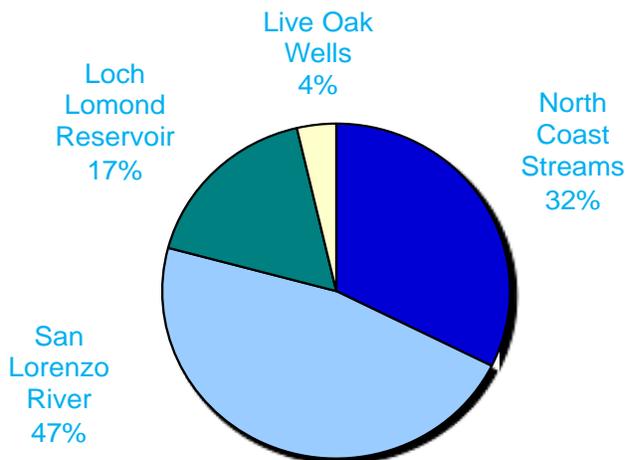
Demand reduction measures will become progressively more stringent as the shortage condition escalates. Where Stage 3 primarily affects residences and landscape irrigation, Stage 4 hits businesses (including hotels, restaurants, office buildings and health care facilities) with a minimum 15% curtailment, and residential customers will have monthly allotments further reduced. Irrigation water on the North Coast farms would be reduced by 50%. Under this scenario, virtually all available water must be reserved either for health and safety purposes or to sustain local business. If the water shortage becomes even more severe, Stage 5 curtailment represents meeting only the most minimal health, safety, and security needs, which is a top priority. A shortage of this severity would generate stress and confusion, particularly for some businesses as they may be forced or required to either partially or completely close if they are highly water dependent. At Stage 3, 4 or 5, the City Council may enact restrictions on new connections.

Projects Contribution to Reducing the Following Drought Impacts:

Drought Impacts	Tait Wells Replacement	Improve Potable Water Quality and Water Supply Reliability to Address Drought Impacts	Conjunctive Use and Enhanced Groundwater Recharge Project at Hanson Quarry
At risk of not meeting existing drinking water demands	x	x	x
At risk of not meeting agricultural water demand		x	
At risk of not meeting existing ecosystem water demands	x	x	x
Facing drinking water MCL violations	x	x	x
Groundwater basin overdraft			x
Other drought-related adverse impacts	x	x	x

At risk of not meeting existing drinking water demands – YES

The drought is highlighting the limitations of the City’s water supply. The City serves 91,291 customers in the City limits, a portion of unincorporated Santa Cruz County, and a small portion of the City of Capitola. Water supply comes from four local sources, all dependent on winter rains. In February 2014, the City Council declared a Stage 3 Water Emergency. Mandatory water use regulations are now in effect to reduce demand by 25%.



Of the four water supply sources (shown in the adjacent graphic), 96% of which are flowing sources, that supply the City with 4,314 million gallons per year (mgy) (or approximately 13,250 acre-feet per year [AFY]) in normal hydrologic years. The yield in any given year is

directly related to the amount of rainfall runoff generated during the winter season. After three dry years, the situation is dire. Cumulative runoff from the San Lorenzo River in 2014 has been below 10,000 acre-feet, classifying this a “critically” dry water year. In comparison, the long-term average for this time of year is 88,585 acre-feet, and during the drought of 1976-77 it was 8,194 acre-feet. Flows on North Coast streams are also reduced.

For the SVWD, production capacity limits SVWD’s ability to meet summer peak demand and historic loss of groundwater storage limits long-term drought resiliency. The existing production wells have been able to keep up with demand through the drought, due largely to effective voluntary conservation measures, but several of the larger producing wells are nearing the end of useful life and a well failure could present a significant challenge. Long-term drought resiliency for both Regional supply and ecosystem requires replenishing groundwater storage in the Santa Margarita groundwater basin.

At risk of not meeting existing agricultural water demands – YES

The City provides both agricultural and municipal water from the North Coast streams. The City does not meet the irrigated acres threshold to prepare an Agricultural Water Management Plan but does serve 34 agricultural users on the North Coast, who produce more than \$1 million worth of strawberries, raspberries, wine grapes, Brussels sprouts and other vegetables. When many farms irrigate at once, flows in the North Coast pipeline are such that City facilities cannot pump. Improved meters will allow the City to better manage irrigation demand timing with municipal pumping and will also facilitate water rationing if the drought continues.

At risk of not meeting ecosystem water demands – YES

The project area includes the southernmost range of a Coho salmon and steelhead spawning area and is within the focus area for federal Coho recovery efforts. Coho that spawn in creeks between the San Lorenzo River in Santa Cruz and Punta Gorda in Humboldt County are considered a distinct population, called the Central California Coast Evolutionarily Significant Unit (ESU) by the U.S. Fish and Wildlife Service. With the legal status of a distinct species, the Central Coast Coho ESU is listed as Endangered under the federal Endangered Species Act. Water management activities of both the City and SVWD have a bearing on the survival of these fish.

The Coho salmon and steelhead generally mass just offshore before spawning season, where they wait for winter rains to fill creeks so they can swim upstream. This year, stream flows have been so low that sandbars have remained closed, and waters are so shallow that many salmon have had their migratory journeys obstructed. It is such an unusual water year that Coho salmon native to Scott Creek, a North Coast stream that is currently blocked by a sandbar, swam into the San Lorenzo River, where they were trapped by low water. Wildlife officials took the extreme step of capturing some of these Coho salmon and moving them to Scott Creek Fish Hatchery. A Coho's typical lifespan is just three years from hatching to spawning. Most coastal streams will thus have three distinct cohorts at any one time. If the drought keeps fish that hatched last winter from reaching the ocean, in addition to barring this year's spawners, creeks in the region stand to lose two of those three cohorts. This could literally drive the Coho salmon to extinction in the Santa Cruz region.

The City must operate Loch Lomond Reservoir and the North Coast Diversions in a manner that protects Coho salmon and steelhead trout, and is committed to releasing water to support fisheries restoration. Interim flow releases began in 2007. The City releases a minimum flow of 1.0 cubic feet per second (cfs) (equal to 0.65 million gallons per day [mgd] or approximately 20

million gallons per month) from Loch Lomond Reservoir and 0.38 mgd or about 11 million gallons per month from the North Coast system to support fisheries habitat restoration. More recently, they have, at the request of fisheries agencies, started release of 6.1 cfs of pulse flows, for 12 hours twice a week. The City is currently undertaking a Section 10 Permit Program pursuant to the Federal Endangered Species Act to mitigate and minimize effects of water management activities on salmon and steelhead. It is clear that implementation of endangered species regulation will result in less water from the City's flowing sources and a greater reliance on water stored in Loch Lomond for municipal purposes.

Recognizing the severity of the drought on community health and safety, in February 2014 the State Water Resources Control Board (SWRCB) Division of Water Rights approved a Petition for Temporary Urgency Change, allowing the City to temporarily reduce the required amount of bypass flow from Loch Lomond from a minimum of 1 cubic foot per second (cfs) to 0.2 cfs. This approval expires in July 2014 but may be extended.

SVWD draws groundwater from the Santa Margarita Groundwater basin, which contributes as much as 40% to baseflows of some tributaries of San Lorenzo River. An objective of the Conjunctive Use and Enhanced Groundwater Recharge Project at Hanson Quarry is to improve the fishery conditions in the San Lorenzo River and its tributaries with the focus on improving summertime baseflows in tributary streams that are critical for fish rearing. Previous studies estimate that up to half of groundwater stored at Hanson Quarry may contribute to baseflows in key tributaries.

Facing drinking water MCL violations – YES

As a result of the drought, the City has been challenged to comply with the Long Term 2 Enhanced Surface Water Treatment Rule and the Stage 2 Disinfectants and Disinfection Byproducts Rule (D/DBPR). These rules focus on maintaining levels of disinfection to reduce the risk from pathogens, while at the same time limiting the use of chemicals for disinfection to prevent production of harmful DBP. The City is on the verge of violating the D/DBPR. Use restrictions have greatly extended the amount of time water is held in the distribution system, which causes DBPs to form. The problem is compounded as the City relies more on water from Loch Lomond, which has higher levels of total organic carbon (TOC) that is a precursor to DBPs. Over the past year there have been periodic exceedances of the maximum contaminant levels for both trihalomethanes (THMs) and haloacetic acids (HAAs) in the distribution system. This has not yet resulted in a primary drinking water maximum contaminant level (MCL) violation because compliance is based on a running average at each of the City's eight sample locations. Continued compliance relies on both maximizing use of the highest quality North Coast sources and managing the DBP formation in the distribution that occurs as the proportion of Loch Lomond water increases.

SVWD water quality data for Water Year 2013 indicate that there are limited MCL issues at SVWD with exception being Well #11B which is above the primary MCL for arsenic. Other SVWD wells are below the primary MCL but may exceed secondary MCL for total dissolved solids (TDS), iron, manganese, and sulfate. As groundwater levels decline, water is likely to have higher levels of arsenic. The proposed injection/aquifer storage and recovery well at Hanson Quarry is expected to meet all primary MCLs, especially as recharge of higher quality water is implemented.

Groundwater basin overdraft – YES

Both the City and the SVWD draw from over-drafted basins. The City's Live Oak Wells are located in West Santa Cruz Groundwater Basin 3-26, and production is derived from the Purisima Formation. Recharge is thought to occur from deep percolation of rainfall in the upper watersheds and along streambeds of three creeks. The wells are normally operated 150 to 200 days of the year. The basin has long been recognized locally as being threatened by over-pumping, as evidenced by a decline in static water levels and a broad, persistent trough consistently below sea level surrounding nearby Soquel Creek Water District's production wells. This trough signals that cumulative groundwater production exceeds the long-term sustainable yield of the aquifer. There is an ongoing risk of regional seawater intrusion due to declining groundwater levels. Even though the City extracts a small proportion of total water taken from the Purisima Formation, because its wells are closest to the shoreline, they would be among the first impacted by seawater intrusion. This potentially could reduce the City's dry year supply and exacerbate supply shortfalls during drought. The Tait Wells Replacement Project draws water from San Lorenzo River underflow and not groundwater.

Historically, groundwater levels have declined in the Scotts Valley area by as much as 250 feet, and groundwater storage has declined from 12,000 to 15,000 acre-feet. Contributing factors included increased groundwater pumping to meet population growth, and reduced recharge due to land use changes associated with urbanization. Since 1993, groundwater levels have become relatively more stable, rising and falling within a range of about 50 feet. While this stabilization is promising, there is a need to replenish the aquifer to restore groundwater levels and baseflows to San Lorenzo River tributaries.

Discharge water TMDL violations – NO

The drought does not put either project proponent at risk for discharge water TMDL violations.

Other drought related adverse impacts- YES

Another immediate adverse impact related to the drought and associated warm, dry weather is increased fire danger in the extensive forests that comprise the watershed lands for the City's source water areas and recharge areas for the SVWD. Temperatures for the first six months of 2014 averaged 59.5 degrees, an all-time high. As a result, fuel conditions not normally seen until late summer were present in May, and fuels are in prime condition for burning putting a premium on retaining both groundwater in storage as well as Loch Lomond storage.

The drought is also having adverse impacts on the financial condition of both project proponents since increased conservation has decreased revenues and increased costs. Implementing the Stage 3 Water Emergency costs the City \$1.03 million in direct expenditures, while revenues decline by about an equal amount due to reduced water sales from conservation for a cumulative financial impact of over \$2 million.

Attachment 2: Water Conservation Measures

In response to the drought, both project proponents have implemented voluntary or mandatory conservation measures. The City has implemented mandatory 25% water curtailments and rebalanced its water supply portfolio. SVWD has implemented voluntary 20% cutbacks. In addition, other local water agencies San Lorenzo Valley Water District (SLVWD) and Lompico County Water District, which share the Santa Margarita groundwater basin with SVWD (and are currently merging), have implemented mandatory 20% cutbacks and declared Stage 2 emergencies. More information about each agency's actions follows.

City of Santa Cruz Water Conservation Measures

The City has a long history of implementing aggressive water conservation measures and is a statewide leader in water conservation. Thanks to the combination of a very strong public conservation ethic and a mild climate, the City has one of the lowest levels of per capita water use, 95 gallons per person per day (GPD), in California. At about half the statewide average of 192 GPD, it is among the lowest 6% of all California public water systems, according to DWR.

The 2010 Urban Water Management Plan (UWMP) outlines the water demand management measures currently being implemented by the City and describes the planning process to guide water conservation activities in the future. In June 2001, the City became a signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), and joined the California Urban Water Conservation Council.

On February 25, 2014 the City Council adopted a resolution declaring a drought emergency and calling for at least a 25% reduction in normal water usage (Stage 3) beginning May 1, 2014 for the following reasons:

- The City draws almost exclusively on local surface water sources where yield varies from year to year depending on the amount of rainfall received and runoff generated during the winter season.
- Water year 2014 appears to be the driest on record, leaving seasonal rainfall amounts far below average for a third consecutive year.
- As a result of extremely low rainfall amounts this year, flows in the North Coast streams and San Lorenzo River that represent the City's primary sources of drinking water supply are anticipated to run at historic low levels during the summer and fall seasons.
- In addition to supplying water for municipal use to water service customers, the City releases water to sustain threatened and endangered fish runs.
- Due to prolonged dry conditions, upstream tributaries to the Loch Lomond Reservoir have yet to significantly replenish storage from the prior year, leaving the reservoir at 65% of capacity as of February 2015.
- The magnitude of the water shortage requires significant actions by the public to achieve at least a 25% reduction, consistent with a Stage 3 Water Shortage Emergency.
- The City has received approval from the SWRCB for a temporary urgency change to the required bypass amount at Loch Lomond Reservoir to help preserve valuable storage.

Emergency regulations and restrictions are in full force and effective from May 1, 2014 until October 31, 2014 unless rescinded earlier or extended by the City Council.

The City's fundamental goal in implementing Water Shortage Contingency Plans in 2014 is to ensure adequate carryover storage is available in 2015, in case the drought continues, to meet community drinking water health and safety needs.

The three primary measures put in place in a Stage 3 Water Shortage Emergency are:

- Enforced water rationing for single family and multi-family residential accounts;
- Significantly scaled back water budgets for large irrigation accounts; and
- Mandatory water assessments, conservation plans and signage for commercial accounts.

Residential rationing commenced on May 1, 2014. Each single family and multi-family residential account was given a monthly allotment, as outlined below.

Account type	Monthly allotment	Equal to
Single-family dwelling	<ul style="list-style-type: none"> • 10 ccf per house 	<ul style="list-style-type: none"> • 249 gallons per household per day
Multi-family residential	<ul style="list-style-type: none"> • 7 ccf per household if your property has 2-4 units • 6 ccf per household if your property has 5-20 units • 5 ccf per household if your property has 21+ units 	<ul style="list-style-type: none"> • 174 gallons per household per day • 149 gallons per household per day • 124 gallons per household per day

*1 ccf = 100 cubic feet = 748 gallons = 1 billing unit

In addition to regular water consumption charges, excess use penalties apply to any water use above the allotment. The first 10% over allotment will cost \$25 per ccf. More than 10% over allotment will cost \$50 per ccf.

Large irrigation account customers receiving Landscape Water Use Reports will be assigned an irrigation allotment equal to one-third of their normal monthly budget. Excessive water use penalties will be applied if the allotment is exceeded.

Businesses are required to help reduce overall water use by limiting irrigation and by notifying the public of the need to save water. Specifically, businesses are only allowed to water landscapes one day per week, and they are required to post signage at business entrances and in restrooms stating, "Save Water. Report Leaks." The signs are available for download and printing on the City of Santa Cruz Drought 2014 webpage. Commercial customers with water use of over 1 mgd are also required to complete an inventory of water use on the site and prepare a water conservation plan outlining actions to be taken to make their business or facility more water efficient.

In addition to the primary water conservation measures, a suite of outdoor water restrictions for all customers is being enforced. These measures include:

- No excessive irrigation
- No landscape watering between 10 am and 5 pm.
- Hose nozzles required.
- No washing down hard or paved surfaces.
- Limited washing of exteriors.
- No draining or refilling swimming pools.
- No uncorrected plumbing leaks.
- No indiscriminant running of water which is wasteful.

These measures will be enforced with penalties ranging from a warning with opportunity to correct the violation for the first offense to a \$500 dollar penalty and installation of flow restrictor for the fourth offense.

The first month of rationing under the Stage 3 Water Shortage Emergency (May 1, 2014 through June 1, 2014) was relatively successful. The goal for water use in the month of May was 8.2 mgd, and the City averaged 8.3 mgd. May was exceptionally warm and under normal water conditions, the City would have used 10 to 11 mgd. 85 violations were logged in May and of those, 22 have been corrected.

Scotts Valley Water District Water Conservation Measures

SVWD became a signatory to the MOU of the California Urban Water Conservation Council in 2005 and has implemented aggressive water conservation measures and recycled water delivery to stabilize falling groundwater levels. Daily per capita water use in 2013 was 115 gallons. The SVWD's Revised 2010 UWMP describes the water Demand Management Measures implemented by the SVWD. To promote water conservation and minimize water waste at all times, SVWD has adopted a water conservation and waste prevention ordinance. Noted below are the prohibitions in effect at all times. Violating these prohibitions may result in a fine.

1. The use of any water from a fire hydrant unless authorized.
2. Any irrigation that creates run off from the area in which it was intended to water.
3. The waste or escape of water through leaks, breaks or plumbing malfunctions that should have been reasonably discovered and corrected in a timely manner.
4. Washing items outdoors – building exteriors, cars, boats, RV, etc without a positive shut-off nozzle on a hose or pressure water.
5. Any ornamental fountain, automated carwash or other such fixture unless re-circulated.
6. The washing of hardscape such as sidewalks, walkways, driveways, parking areas, tennis court, patios, and alleys except when necessary to alleviate safety or sanitary hazards and when a broom or other waterless device will not suffice.
7. Overhead spraying to irrigate any plants between the hours of 10 am and 5 pm.
8. Overhead irrigation anytime it is raining.
9. Any mechanical equipment purchased after this ordinance that utilizes a single-pass cooling system. Water for all cooling shall be re-circulated.
10. Using potable water for dust control or soil compactions in construction where there is a reasonably available source of recycled water.
11. Constructed water features, including lakes, ponds, waterfalls, fountains and streams without an impermeable liner.
12. Watering during a publically declared drought that is not approved.
13. Indiscriminate running of water or washing with water which is wasteful and without reasonable purpose.

SVWD is effectively in a Stage 1 Water Shortage, defined as a precipitation of less than 60% of average for two consecutive years and/or a single year with less than 50% of average precipitation. According to the UWMP, Stage 1 corresponds to the voluntary demand reduction of 10%. However, with no certainty for climate conditions in future years, the Board of Directors adopted Resolution No. 02-14 implementing a voluntary 20% reduction in potable water use effective immediately (with no reduction for recycled water use).

To support the 20% voluntary reduction in water use, the Board of Directors authorized staff to implement a Special Water Use Efficiency Program for 2014 that includes: 1) a portfolio of

conservation rebates with the maximum total allowance of \$100,000; 2) enhanced community outreach and education through regional partnership with Ecology Action, a local non-profit organization; and 3) increased efforts on converting potable irrigation uses to recycled water connections where feasible. The portfolio of rebates will result in estimated combined water savings of 2.3 million gallons. Rebates will be available for a variety of retrofits, including toilets, washers, showers, lawn, drip irrigation, and greywater systems.

The Board of Directors declared May 2014 Water Awareness Month (Resolution No. 03-14). SVWD, through contract with Ecology Action, is participating in a regional campaign to increase community awareness on the water supply scarcity, promote efficient water use and achieve decreases in the consumption not only through plumbing fixture replacement programs but also through behavior changes. The scope of work includes a portfolio of service offerings that are designed to drive real customer behavior changes that support residents and businesses to reduce demand and encourage long-term conservation.

The campaign includes the following elements:

- WaterWise Gardening Workshops (16 events)
- WaterWise Tabling (20 events)
- Residential Door-to-Door Outreach (800-1000 units)
- Residential Advisor (200-260 homes)
- Commercial Advisor (90-120 businesses)
- PreRinse Valve Installation (200-250)
- Website and Pledge Administration

San Lorenzo Valley Water District Water Conservation Measures

The San Lorenzo Valley Water District shares the Santa Margarita groundwater basin with the SVWD. On April 3, 2014 the San Lorenzo Valley Water District declared a water shortage emergency (Resolution No. 26 (13-14)). As of May 1, 2014 they are implementing Stage 2 water shortage restrictions. Such restrictions aim to reduce overall water demand by 20% by focusing on reductions in outdoor water use. Stage 2 outdoor water restrictions include:

- No watering or irrigating between 10 am and 5 pm
- No outdoor watering on Monday.
- Outdoor irrigation is permitted only 3 days a week: if your address ends in an EVEN number, water only on Tuesday, Thursday and Saturday; if your address ends in an ODD number, water on Wednesday, Friday and Sunday.
- On your watering days, limit irrigation to 15 minutes per station.
- Do not wash down hard or paved surfaces.
- Do not initially fill, or drain and refill residential swimming pools.
- Drinking water will only be served at restaurants upon request.
- Shut-off nozzles are required on all hoses.

Exemptions include: drip irrigation and edible gardens. Water use restrictions will remain in effect until further notice.

By reducing overall system demand by 20%, SLVWD aims to avoid implementing Stage 3 Water Restrictions, which would include rationing.