



TUOLUMNE – STANISLAUS INTEGRATED REGIONAL WATER MANAGEMENT REGION

2014 IRWM DROUGHT GRANT PROPOSAL

ATTACHMENT 2 – DROUGHT IMPACTS

**Integrated Regional Water Management Program
Applicant: Tuolumne-Stanislaus Integrated Regional Water Management Authority**

I. Drought Impacts

The drought impacts on the Tuolumne-Stanislaus IRWM Region (T-Stan Region), as a whole, have been exceptionally severe. Impacts have included significant unanticipated expenses both directly to water purveyors for increased conservation efforts and reduced revenue, as well as indirectly through critical work water purveyors could not complete due to staff being redirected to enforce drastic conservation measures.

Tuolumne Utilities District (TUD) has already spent over \$1,000,000 in 2014 on capital improvements and associated labor related directly to drought response. In addition, even with recently approved rate increases, TUD has also experienced a reduction in revenue of approximately 20%. The much smaller Twain Harte Community Services District (THCSD) has spent over \$100,000 on conservation efforts and has deferred some critical infrastructure improvements.

From a regional agricultural standpoint, some industries such as the cattle business are significantly changing their operations due to the drought, including being forced to modify their ability to use some irrigated pastures. Some businesses are selling cattle sooner at a lighter weight, spending more money for hay and supplemental feed, and experiencing increased transportation and holding costs. Permanent tree and vine crops in the region have limited irrigation water available and are experiencing similar significant decreases in crop volumes and values.

Additional economic impacts in the region include widespread landscape damage to residences, businesses, public parks, and institutions caused by the early adoption of drastic water restrictions and outright prohibition on lawn watering. In addition, tourism and recreation supported businesses have suffered significant economic losses caused by widely publicized water restrictions and historically low reservoir and river flow levels.

The drought has exacerbated to a critical level the reliability of the water supply serving the major population centers of Tuolumne County. Due to permit requirements and the drought, PG&E has been precluded from delivering water to TUD from its only supply reservoirs during the summer. This prohibition has caused TUD to implement some of the most stringent water conservation measures in the state, and has led to the inability of TUD to provide water service to new development projects with even moderate demands. There are no other readily available sources of water supply adequate to replace, or even significantly supplement that available to TUD. New water supply projects including surface water rights, diversions and dams will take many years to plan and implement.

The measurable drought conditions in the T-Stan Region, like much of California, have included below average precipitation, minimal snowpack and above average temperatures:

Precipitation: According to the California Data Exchange Center, the T-Stan Region (located in the San Joaquin 5-Station area) only received 19.2” of rainfall this year. That equates to about 47% of the annual average of 40.8”. Over the past three years, the T-Stan Region is 51.2” below average precipitation – more than one year behind.

Snowpack: DWR’s May 1st snow survey reported only 18% of average water content. By the end of May, water content was 0% of normal. This is significant for California, since snowpack accounts for about 1/3 of the state’s water. It is even more significant for the T-Stan Region,

since its communities rely on snowpack every year to feed its small water storage reservoirs throughout the summer months.

Temperature: 2014 temperatures have been higher than average and, according to the National Weather Service, have a 40% chance of being above average through summer and early fall 2014. These high temperatures minimized this year's snowpack and resulted in a much quicker melt than in normal years. Coupled with lack of precipitation, they have also resulted in much higher wildfire risk than normal. Wildfire is a significant threat to the mountainous areas of the T-Stan Region, as demonstrated in last year's historic Rim Fire, and puts a significant strain on the water supply.

These exceptional drought conditions are severe enough to impact every California water provider; however, most of these providers have sufficient storage capacity, source diversity and/or groundwater wells to weather severe droughts. This is not the case in the T-Stan Region. Over 98 percent, approximately 1.7 Million AFY, of the surface water generated in the region is exported for environmental compliance purposes and for consumption to the Central Valley, East Bay, and San Francisco areas.

In Tuolumne County, the major purveyors are, TUD, Groveland Community Services District (GCSD) and THCS, serving a combined population of over 25,000. There are also over 20 private and mutual water companies that serve an additional 5,000 people, and numerous isolated, rural independent wells and springs.

In the Calaveras County portion of the region, the primary water purveyors are, Calaveras County Water District (CCWD), Utica Power Authority (UPA) and Union Public Utilities District (UPUD), serving a population of approximately 14,000 within the T-Stan Region. There are also numerous community water companies, mutual water companies, and seasonal and transient water systems serving a local and transient population of approximately 8,000. (Final Water and Wastewater Municipal Service Review, Adopted June 18, 2012, Calaveras County Local Agency Formation Commission)

Groundwater supply in the T-Stan Region is largely considered unreliable, but still provides as much as 30% of the domestic water supply for private wells in Tuolumne County, and historically has been a significant water supply in southern Calaveras County.

The unusually large number of water providers for a region of this size is a legacy of the region's gold mining history, relationship with PG&E and large downstream water districts, and history of dispersed development leaves the community with unique challenges and inefficiencies. These challenges become further exacerbated when dealing with drought conditions and the need to conserve.

The severity of this drought is unprecedented in regional history. For example, the majority of TUD's water supply is stored in two upland reservoirs: Pinecrest Reservoir and Lyons Reservoir. These two reservoirs rely solely on snowpack to fill and spill. The two reservoirs are connected by the South Fork of the Stanislaus River with Pinecrest being at a higher elevation. California State law does not allow water in Pinecrest Reservoir to be drawn down past a predetermined elevation until after Labor Day.

Lyons reservoir typically has an end of spill date of mid to late July, after which the storage in Lyons Reservoir supplies Tuolumne County for about 65 days until the State allows water to be released out of Pinecrest. Once this happens, TUD can start to fill Lyons Reservoir. This year, the end of spill for Lyons

Reservoir was June 4th. This leaves the County with an additional 45 days to rely on the supply stored in Lyons Reservoir.

THCSD's only water source is raw surface water that it purchases from TUD and receives via an open ditch system. This system is already vulnerable to normal droughts; the current drought's historical severity has resulted in major impacts. To insure delivery of sufficient water for health, sanitation and fire suppression, both TUD and THCSD were forced to implement mandatory 50% water conservation measures in early February 2014 – measures more extreme than nearly all other water providers in the State.

Even with 50% mandatory conservation measures in place, both THCSD and TUD face extreme challenges to continue to insure basic water needs are provided for throughout summer 2014. Conserving water throughout the summer is further complicated by the T-Stan Region's economy, which heavily relies on tourism. Summer water demands are more than double those seen during the summer months. For most California water providers, this is a result of outdoor watering. However, because much of TUD and THCSD service areas are in a mountainous area, landscaping is primarily natural forest, requiring little to no increased watering during summer months. For example, THCSD's increase in summer water demands is a direct result of its population more than doubling due to summer tourism. Local residents have adjusted water use over several months in an effort to meet the 50% conservation requirements, but gaining the same level from tourists will be nearly impossible. This significantly threatens THCSD's and TUD's ability to provide basic water needs to its customers throughout summer 2014.

GCSD relies on agreements with San Francisco Public Utilities Commission (SFPUC.) Due to the unprecedented drought conditions the volume of water stored in the Hetch Hetchy reservoir is insufficient to supply the demand of the SFPUC. To address the water shortage SFPUC is planning to introduce water from the Cherry Reservoir into the Mountain Tunnel through the Lower Cherry Aqueduct (LCA project). The SFPUC Mountain Tunnel is the raw water source for GCSD. This new source of water will supply 200,000+ acre-ft of additional water to customers in the Bay Area.

The water source from the Mountain Tunnel is the Hetch Hetchy reservoir which is relatively pristine and, as a result, GCSD has been able to avoid filtration of that source. SFPUC prepared an application to the California Department of Public Health (CDPH) in 1993 requesting a filtration waiver. The conclusion was that the Hetch Hetchy water source met all of the eleven criteria for EPA filtration avoidance as of June 29, 1993. SFPUC has provided routine monitoring of the watershed and has avoided the need to provide filtration since.

The LCA project will allow SFPUC to convey either Cherry Reservoir water or Hetch Hetchy water into the Mountain Tunnel. The introduction of Cherry Reservoir water proposed by SFPUC is expected to be in effect by the end of year 2014. The introduction of additional water supplies into the Mountain Tunnel by SFPUC will void the filtration avoidance granted in 1993 and will obligate GCSD to filter the water or apply for a new filtration waiver that includes the water from Cherry Reservoir.

CCWD and UPA are the only municipal water purveyors in the Region with existing water rights, although these rights are not adequate to fully provide for normal demand. The City of Angels relies on UPA to provide water.

Regional Drought Impacts by Water Purveyor

At Risk of Not Meeting Existing Drinking Water Demands

TUD is at risk of not meeting existing drinking water demands due to the drought. On January 28th TUD implemented Phase II water conservation measures to help ensure that clean and safe drinking water is provided to all treated water customers in the District. Phase III Water Conservation called for 50% water reduction and significant reductions in irrigation water deliveries and water treatment plant operations. The ditch system was turned off at the last water treatment plant on each ditch. This ceased end losses at the ends of the ditches. The backwash time and frequency at the water treatment plants were decreased and wells were brought online to help alleviate the water supply shortage.

THCSD may not be capable of providing basic drinking water demands due to the severity of this drought. As a raw water wholesale customer of TUD, THCSD must comply with TUD's mandatory Phase III water conservation requirements. These requirements cut deliveries to raw water customers by 50% of last year's use. THCSD implemented similar mandatory 50% conservation requirements in early February since it relies solely on raw water from TUD to provide drinking water to its customers. Over the past four months, THCSD customers have rallied together to average 38% less use than last year. This is a significant feat for a community with minimal outdoor watering where the average residential water use is already only 61 gallons per day per capita. Summer tourism will make the 50% requirement even harder to meet, putting THCSD at risk of not meeting existing drinking water demands. In an effort to meet drinking water demands, THCSD has implemented water recycling improvements, conducted customer leak surveys and is in the process of drilling a well. Without alternative water supply sources, however, THCSD will continue to be at risk of not meeting drinking water demands.

At Risk of Not Meeting Existing Agricultural Water Demands

TUD is not meeting some existing agricultural water demands due to the drought. TUD has curtailed ditch flows on the Algerine Ditch and has turned off ditch segments that have bypass pipelines. Many agricultural accounts were turned off completely including 18 agricultural users on the Algerine Ditch and 1 agricultural user on the Shaws Flat Ditch. The Shaws Flat has been turned back on as of April. In addition to turning off some ditch users, all agricultural users have been cut back by 50 percent.

THCSD does not have any agricultural customers; however, all of THCSD's wastewater is treated by Tuolumne Utilities District (TUD) and recycled for agricultural use. By implementing 50% mandatory conservation measures, THCSD puts TUD at risk of not meeting existing agricultural water demands of recycled water users.

At Risk of Not Meeting Ecosystem Water Demands

TUD is at risk of not meeting ecosystem water demands. By reducing the flows in the ditch system and by terminating flows that would otherwise result in end loss reservoirs, wildlife habitat will be disturbed. Temperatures in the reservoirs will rise due to shallow water levels which allow more algal growth. This growth will eventually be followed by algal death, after which the algae are consumed by aerobic bacteria which consumes oxygen. The decomposition process can significantly deplete the oxygen levels in the reservoir and can lead to fish and plant deaths.

THCSD is at risk of not meeting ecosystem water demands. THCSD relies on Shadybrook Reservoir, a small 10 acre-foot back-up reservoir, every year during PG&E's routine ditch maintenance. Since the PG&E ditch conveys THCSD's primary source of water, THCSD must utilize water from Shadybrook

Reservoir to provide its customers (and neighboring water agencies) water during the outage. The drought complicates this need because THCS D will need to draw from Shadybrook Reservoir throughout the summer to continue to supply enough water for health, sanitation and fire suppression to account for its primary water supply being cut by 50%. Drawing water from Shadybrook Reservoir for the outage and for drought needs will likely deplete the reservoir. Without water available to replenish it temperatures in the reservoir will rise allowing for more algal growth and a decomposition process as described above.

Drinking Water MCL Violations

TUD is at risk of drinking water MCL violations. Due to the drought, TUD requires a greater reliance on groundwater. Wells in the area have been known to contain iron and manganese levels three times greater than the MCL. These wells require additional treatment and need to be filtered.

THCS D is at risk of drinking water MCL violations. Due to the mandatory 50% conservation measures implemented to insure water supply during the drought, flows are lower than normal, resulting in water quality concerns at dead-end areas. To avoid MCL violations, THCS D has had to increase its flushing program to keep Trihalomethane (THM) and Haloacetic Acids (HAA5) levels below State MCL's. Flushing many of these areas is not necessary during normal years and is a direct result of the mandatory conservation measures. Increased flushing also limits water availability

Groundwater Basin Overdraft

Not applicable for the major water purveyors as they are not part of a groundwater basin. However, approximately 30% of the water supply in Tuolumne County is provided by small, privately owned individual wells. All groundwater wells within Tuolumne County are in fractured rock, meaning that water is obtained through fractures located in granite bedrock which are fed each year by snowmelt. These fractures are not connected to a groundwater aquifer and, thus, fractured rock wells behave differently than wells located within groundwater basins. While not within a groundwater basin, these wells are subject to overdraft because of the lack of snowmelt.

Discharge Water TMDL Violations

Not applicable.

II. Water Conservation Measures

Each of the major water purveyors within the region have implemented Stage 3 mandatory water conservation measures. A summary of each is provided below.

Calaveras County Water District - Implemented Stage 3 mandatory water conservation measures, effective June 14, 2014. The district has encouraged its customers to voluntarily conserve water since Governor Brown's drought declaration. The Stage 3 Measures include the following:

- CCWD will undertake public outreach to educate the public about water conservation.
- Use of water for cleaning hardscape is prohibited.
- All irrigation is prohibited between 10 a.m. and 6 p.m.
- Line flushing will be discontinued.
- Water may only be used in decorative fountains and recreational ponds to preserve aquatic life.
- Filling new or existing pools is prohibited.
- Residential landscape irrigation will only be allowed on an odd/even watering program.
 - Odd-numbered addresses: Tuesdays, Thursdays and Saturdays.
 - Even-numbered addresses: Mondays, Wednesdays and Fridays.
 - No outdoor watering on Sundays.
- Water for irrigation of commercial landscape, schools and parks shall be reduced by 35 percent.
- Where permitted by the state, treated effluent, rather than raw water, will be used for dust control.
- Golf course irrigation will be restricted to greens and tees if raw water is the sole source. Raw water delivery will be reduced by 35 percent where treated effluent is being used.

CCWD has also enacted enforcement measures to ensure customers abide by the mandatory water conservation measures:

- If customers violate the conservation order, they will first receive a written warning.
- If the problem persists, those in violation will have their water governed by a flow-restricting device for a period of 30 days, or until the CCWD Board of Directors repeals the state of emergency.
- The district may also pursue a misdemeanor violation of California Water Code Section 31029. If convicted of this crime, a person could be put in jail for up to 30 days, fined up to \$600, or both.

Twain Harte Community Services District - Toward the end of 2013, THCS D began working closely with TUD as predictions for a continued drought started to become a reality. As both agencies planned on how best to mitigate the current and imminent impacts of the drought, the following conservation measures were declared:

- January 17, 2014 – Governor Brown declares a water shortage emergency and requested voluntary statewide 20% water conservation.
- January 28, 2014 – TUD declared a water shortage emergency and implemented Phase III Mandatory Water Conservation Measures with a reduction goal of 50%.
- January 29, 2014 – THCS D declared a water shortage emergency, requested 50% water conservation and implemented a prohibition on non-essential water use. Non-

- essential water use includes hardscape washing, vehicle washing, sprinklers and non-emergency fire hydrant use.
- February 4, 2014 – Tuolumne County declared a local state of emergency due to drought.
 - February 25, 2014 – THCSO modified its water conservation ordinance to include a four-phase system to account for varying levels of water conservation. THCSO also implemented Phase III Mandatory Conservation Measures, requiring 50% reduction.

THCSO's Phase III Mandatory Conservation Measures require a 50% reduction in water use compared to the same month last year. Failure to comply with the mandatory reduction results in progressive penalties and installation of flow restrictors – more than 300 penalties have been issued as of June 2014. The mandatory conservation measures also prohibit the following:

- Lawn watering
- Use of drip irrigation more than twice per week
- Vehicle washing
- Hardscape washing
- Construction watering
- Filling pools/spas
- Decorative fountains and water features
- Customer leaks lasting more than 7 days without repair

In addition to the Phase III Mandatory Water Conservation Measures, the District has implemented several other measures to conserve water:

- *Public Outreach* – THCSO has cooperated with other agencies to produce radio/newspaper advertising and conduct public information forums. Additionally, THCSO has posted educational signs, performed internet advertising and has sent informational mailers to its customers. THCSO offers free low-flow showerheads and faucet aerators as well as toilet dye tabs to its customers.
- *Water Recycling* – THCSO designed and completed a project to recycle monitoring equipment water at its water treatment plant. This project recycles approximately 4,000,000 gallons per year (about 3.5% of THCSO's annual water usage).
- *Customer Leak Detection* – THCSO's smart water meters produce a monthly report identifying customers with continuous leaks. THCSO's staff has worked with customers to notify, identify and make sure leaks are repaired within seven days of the report. Fixed customer leaks have resulted in a savings of more than 700,000 gallons per month.
- *Operational Changes* – THCSO has stopped all watering to its community park. THCSO's fire department has ceased all water-related training. THCSO has shifted its normal sewer cleaning so that all lines are videoed first and cleaned only when necessary.

The above practices in conjunction with THCSO's Phase III Mandatory Water Conservation Measures will continue as long as the drought poses a significant threat to THCSO's ability to provide its customers with sufficient water for health, sanitation and fire suppression.

Tuolumne Utilities District – In October 2013, TUD realized the potential water supply issues that would result if we had another “dry” year. TUD worked with PG&E to make operational changes to

ditch flows to retain as much water in upland storage as possible. In January 2014, TUD and PG&E submitted a formal request to FERC and the California Fish and Wildlife Service to lower environmental flows out of Lyons Reservoir. On January 17th, 2014 Governor Brown declared a water emergency in California and on February 4th, 2014 the Tuolumne County Board of Supervisors declared a local state of emergency due to the drought conditions and the imminent threat of disaster.

On January 17th, 2014 TUD's Board adopted Phase II conservation. During Phase II Water Conservation, customers are notified of a low water year and are requested to conserve, hydrant testing is prohibited, and restaurants shall serve water only upon customer request.

On January 28th, 2014, TUD's Board adopted Phase III Water Conservation measures including a mandatory 50% reduction in water use over the same period last year for each customer.

The adopted Phase III water conservation prohibits:

- All lawn watering
- Filling of all swimming pools, including those of the County Recreation Dept.
- Use of drip or sprinkler irrigation between 10am and 7pm
- Washing of vehicles or sidewalks
- Installation of new landscaping

If customers continue to use excessive water, flow restrictors will be installed on the customer's meter. If excess water use continues further TUD has the authority to fine the customer up to \$500.

In addition to the Phase III Water Conservation measures, the District has made operational changes in order to conserve. TUD has reduced the flows in the ditch system, reduced backwash time and frequency and has curtailed distribution system flushing. Active public awareness campaigns with radio spots, newspaper ads, and internet advertising were also accomplished.

Groveland Community Services District - GCSO has implemented Stage 3 of its Water Shortage Conservation Plan (WSCP). Stage 3 is a mandatory stage and includes water conservation practices such as higher water rates for consumption in excess of 4,000 gallons per month (above Tier 1), as well as prohibitions on some of common water uses. The projected reduction in water usage of Stage 2 is 20 percent. Some of the mandatory water conservation measures in effect include:

- No washing of sidewalks, walkways, etc.
- Adjust sprinklers and irrigation systems to avoid overspray, runoff, and waste.
- Irrigate residential and commercial landscape before dawn
- Use water efficient landscaping
- Use Recycled water or non-potable water for construction
- No washing of cars, boats, trailers, etc. (except at commercial car washes)

Should drought conditions continue into 2015, GCSO will implement Stage 4 of its WSCP. Stage 4 is a mandatory stage and includes water conservation practices such as higher water rates for consumption in excess of 4,000 gallons per month, as well as prohibitions on many of common water uses. The

projected reduction in water usage of Stage 4 is 50 percent. Some of the additional mandatory water conservation measures that will be implemented if Stage 3 is adopted include:

- No landscape watering
- No filling of new or existing pools and hot tubs.

Other Private Water Companies – Many of the smaller mutual water companies and private water systems within the region are experiencing the same water supply shortages, but are not mandated to implement any specific water conservation measures. Many rely on small groundwater wells or springs. Some have implemented voluntary conservation actions including requests for conservation through various levels of customer outreach using posters on local bulletin boards, signage within the communities they serve, bill stuffers, etc. These efforts are not consistent throughout the region and do not include any coordinated management.