

Title XVI Feasibility Study for Pure Water Project Las Virgenes-Triunfo

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A. TECHNICAL PROPOSAL AND EVALUATION CRITERIA

I. EXECUTIVE SUMMARY

Date, applicant name, city, county, and state:

Date: December 20, 2016
Applicant: Las Virgenes Municipal Water District
City: Calabasas
County: Los Angeles County
State: California

Project summary:

The Las Virgenes Municipal Water District (LVMWD), in partnership with the Trlunfo Sanitation District, is proposing a new Title XVI feasibility study for an indirect potable reuse project that would produce up to 5,151 acre-feet per year of new, local, drought-resilient water supplies. The project would enable LVMWD to capture all of its unused recycled water available during winter low irrigation demand season, purify it at a new advanced water treatment plant, and augment imported drinking water supplies stored at its existing Las Virgenes Reservoir. New regulations to support the project proposal, known as "reservoir augmentation", are expected to be released by the State Water Resource Control Board, Division of Drinking Water in February 2017. Currently, the unused recycled water is released to Malibu Creek, which is an impaired water body and drains to the Santa Monica Bay. Recycled water is the only local water supply within the service area; there is no groundwater of sufficient quantity or quality for municipal use. Every acre foot of recycled water that is beneficially used offsets an equivalent acre foot of imported water from the State Water Project. Importing water from State Project to the service area is very energy intensive, as compared to locally purified recycled water, and places additional strains on the sensitive Sacramento-San Joaquin Bay Delta. Further, the current practice of releasing the unused recycled water to Malibu Creek contributes to impairments of the receiving waters for nutrients and benthic macroinvertebrates according to a 2013 U.S. EPA Malibu Creek and Lagoon Total Maximum Daily Load for Sedimentation and Nutrients to Address Benthic Community Impairments. The project proposal was developed through a collaborative, stakeholder-driven process that involved over 17 organizations with various roles in the Malibu Creek Watershed. Six conceptual alternatives were developed and evaluated by the stakeholders and indirect potable reuse via reservoir augmentation was identified as the best option to meet the project objectives. The proposed Title XVI Feasibility Study would leverage preliminary engineering studies and evaluate the amount of available recycled water, appropriate treatment methods, regulatory requirements, treatment plant siting options, pipeline alignments, reservoir hydrodynamics, environmental considerations, and estimated costs and benefits. The project will take approximately 365 calendar days to complete and will be submitted for Reclamation review by January 31, 2018.

Background data:

The Las Virgenes-Triunfo Joint Powers Authority (JPA), a partnership between LVMWD and Triunfo Sanitation District, provides wastewater treatment, biosolids composting and wholesale recycled water production for the northwestern portion of Los Angeles County and the southeastern portion of Ventura County. The population of the service area is approximately 100,000. LVMWD serves as the JPA's Administering Agent. The JPA's service area generally consists of the Malibu Creek Watershed and small portions of the Los Angeles River Watershed. Figure 1 shows the service area of the JPA. LVMWD also provides potable water service to its entire service area and Triunfo Sanitation District provides potable water service to the Oak Park portion of its service area. The new, local water supplies developed by the project would benefit the service areas of both agencies. In both cases, 100% of the potable water is imported from the State Water Project and purchased from the Metropolitan Water District of Southern California. The agencies comprising the JPA have a long history of providing recycled water in their respective service areas, serving their first customers in the early 1970s. In the case of LVMWD, 20% of its current annual water demand is met with recycled water and over 65% of all wastewater treated is used for recycled water irrigation. The recycled water is primarily used for landscape irrigation of schools, parks, streets and highway medians, property association common areas and golf courses through its extensive recycled water distribution system. Today, the JPA has an extensive investment in facilities that span two counties, making beneficial use of a resource that would otherwise go to waste. However, recycled water demands drop significantly in the cooler winter months while wastewater flows remain relatively constant. Lacking seasonal storage for the excess recycled water, the JPA releases the valuable resource to Malibu Creek, which drains to the Pacific Ocean after passing through Malibu Lagoon.

The Tapia Water Reclamation Facility (Tapia) produces tertiary-treated recycled water standards specified in Title 22 of the California Code of Regulations. Current average production of recycled water is approximately 10,000 acre-feet per year or 9.5 million gallons per day (MGD). Future annual production is estimated to increase to 13,400 acre-feet (12.0 MGD) by 2030. Current recycled water sales are approximately 6,500 acre-feet per year and estimated to increase to 8,800 acre-feet per year by 2030. Recycled water in excess of demands is discharged into Malibu Creek pursuant to Tapia's National Pollutant Discharge Elimination System (NPDES) Permit. However, recycled water discharge to Malibu Creek is prohibited from April 15th to November 15th of each year. During the discharge prohibition periods, recycled water in excess of demands is disposed of by pumping/dischARGE to the Los Angeles River and sprayfield application. Also, the JPA is required to release water to Malibu Creek to support endangered Southern Steelhead when streamflow drop below 2.5 cubic feet per second as measured by a County of Los Angeles stream gage.

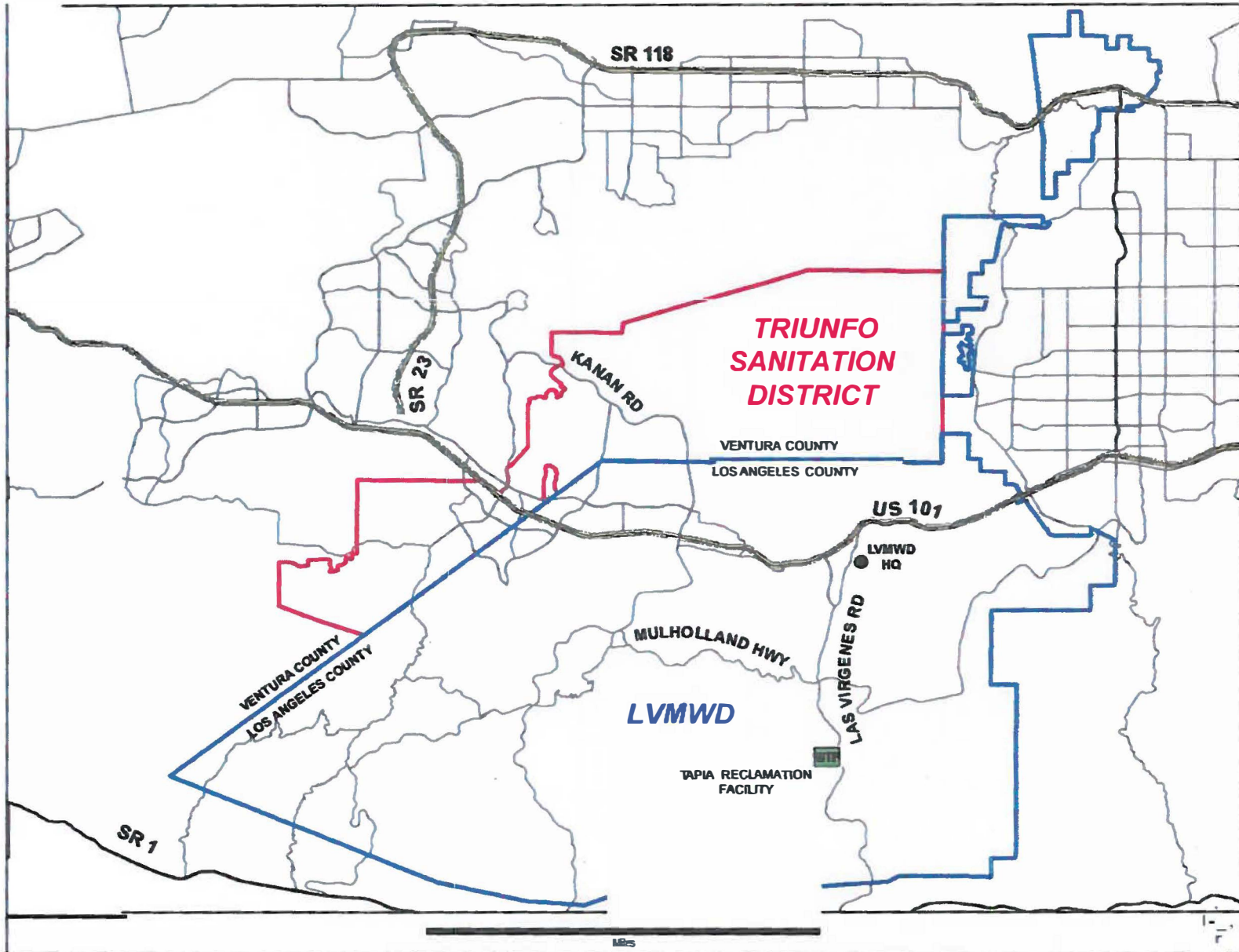


FIGURE 1: SERVICEAREA

According to the California Energy Commission, 19% of the state's electricity and more than 30% of the natural gas use (aside from what is consumed by power plants) and annually 88 million gallons of diesel fuel consumption are associated with water use and wastewater treatment¹. The California State Water Project (SWP) is the single largest energy user in the state, consuming five billion kWh per year, accounting for 2 to 3 percent of all electricity consumed in California².

The JPA members purchase 100% of their potable water from Metropolitan Water District of Southern California (MWD). The water for the region is treated at the Joseph Jensen Water Treatment Plant in Granada Hills, which is supplied with imported water from the SWP. For each acre-foot of water transported to and treated at Jensen, 4.09 MWh of electricity is consumed. For each MWh of electricity produced, an average of 0.433 tons of CO₂ is emitted, so for each acre foot of water delivered to the JPA's service area, 1.77 tons of CO₂ is emitted³. The transmission, distribution and advanced treatment of an acre foot of recycled water consumes an average of 2.05 MWh of electricity, resulting in 0.89 tons of CO₂ emitted. For every acre foot of advanced treated recycled water that replaces imported water, a reduction of 2.04 MWh of electricity and 0.88 tons of CO₂ emissions are realized. As a result, the production of 5,151 acre-feet of water through indirect potable reuse would result in an annual reduction of 10,508 MWh of electricity and 4,533 tons of CO₂ emissions.

In addition to significant reductions in energy consumption and greenhouse gas production, the project would reduce the service area's dependence on limited imported water from the State Water Project. The ongoing record-setting statewide drought in California has illustrated the importance of developing new local water supplies and reducing the need for already strained imported sources. Continuing declines in the populations of Delta Smelt and Winter-Run Chinook Salmon in the Sacramento-San Joaquin Bay Delta have highlighted the fact that the ecosystem is in distress. Further, climate change, sea level rise, seismic activity and subsidence threaten the Delta and its functionality as the hub of California's water system.

LVMWD has had several previous working relationships with Reclamation:

- a. 2002, LVMWD was part of the Project Advisory Committee for the Southern California Comprehensive Water Reclamation and Reuse Study, Phase II.
- b. 2002, Cooperative Agreement No. 01-FC-35-0038, Malibu Golf Course Recycled Water Main Extension Project.
- c. 2009, Cooperative Agreement No. R09AP35R20, American Recovery and Reinvestment Act of 2009, Mulholland Highway Recycled Water Transmission Main.
- d. 2011, Title XVI Feasibility Study for a Recycled Water Storage Reservoir

¹ California Energy Commission, *Integrated Energy Policy Report*, November 2005, CEC-100-2005-007-CMF.

² Natural Resources Defense Council, *Energy Down the Drain: The Hidden Costs of California's Water Supply*, August 2004.

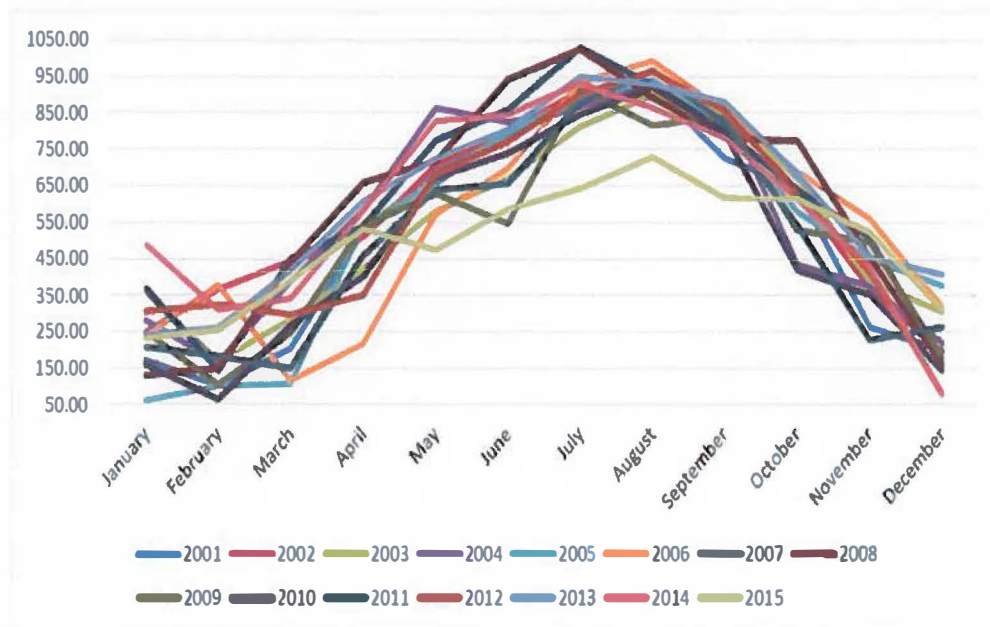
³ Calleguas Municipal Water District, *CO₂ Emissions and Imported State Project Water to Ventura County*, January 25, 2007.

II. STUDY DESCRIPTION:

The Title XVI Feasibility Study would consist of engineering studies and analyses to evaluate the amount of available excess recycled water, appropriate treatment methods, regulatory requirements for indirect potable reuse via reservoir augmentation, treatment plant siting options, pipeline alignments, reservoir hydrodynamics, environmental considerations, and estimated costs and benefits. The work would leverage existing information and preliminary analyses developed through a collaborative, stakeholder-driven process to screen six alternatives to beneficially use all of the JPA's excess recycled water.

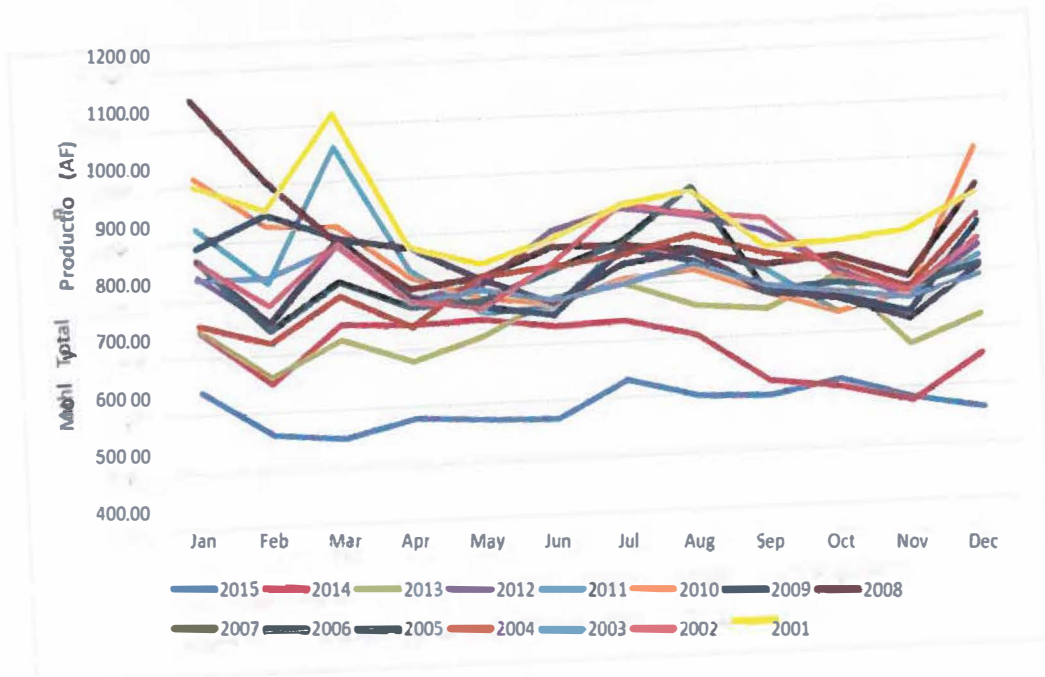
The proposed study would provide a solution to a major challenge the JPA has been working to resolve for many decades. The challenge is the seasonal imbalance in the supply and demand for recycled water. Since the majority of the District's recycled water is used for irrigation, demands are highly variable with peak demands occurring during the warm summer months. Based on recycled water demand data from a *2007 Recycled Water System Master Plan Update*, the monthly average demand during the peak summer months fluctuates from 800 to 1,000 acre-feet per month (AF/month). However, demands can drop to near zero during the cool winter months, particularly during periods of rainfall when irrigation is not required. Figure 2 illustrates the seasonal difference in recycled water demands from 2001 to 2015.

Figure 2: Monthly Recycled Water Demands



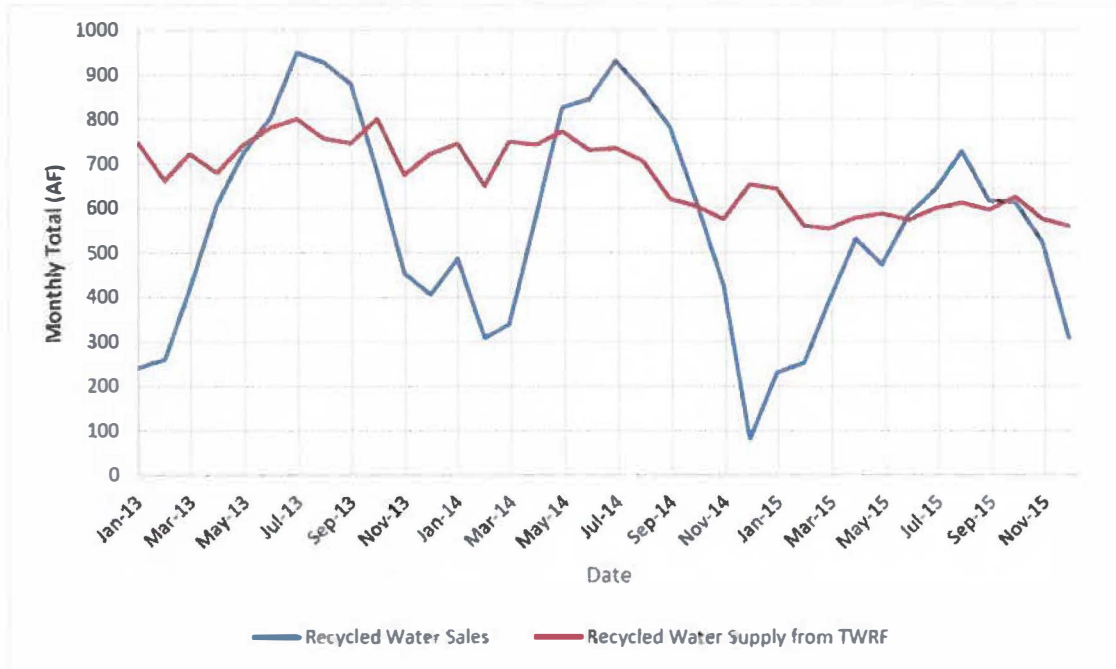
The daily supply of recycled water produced by Tapia is fairly constant. On occasion, the influent flow varies significantly, primarily due to infiltration and inflow during and after rain. In the past, these influences have doubled the daily flows at the treatment plant during winter storm events; however, these increased flows drop back down to normal within a few days. Historically, Tapia has produced an average of approximately 9.5 MGD of recycled water, but recent average flows are lower due to significant indoor water conservation associated with response to the on-going statewide drought. Flows are expected to return to near historical levels in the future. Figure 3 illustrates the long-term monthly average volume of recycled water produced by Tapia from 2001 to 2015.

Figure 3: Monthly Volume (AF) of Recycled Water Produced



With only minimal operational storage for recycled water (no seasonal storage), the excess recycled water cannot be retained during the winter for use in the summer. As a result, the excess recycled water is released to Malibu Creek, draining to the Pacific Ocean. Figure 4 (next page) consists of a chart comparing recycled water supply from Tapia with recycled water sales (demand) from January 2013 through November 2015. The area between the two trend lines represents the amount of excess recycled water available (winter months) and the amount of shortage (summer months). The excess recycled water is released to Malibu Creek. The project would enable the JPA to fully utilize the excess recycled water, treat it at a new advanced water treatment plant and supplement potable supplies stored at Las Virgenes Reservoir. In turn, the JPA's member agencies would be able to offset their purchases of imported water by an equivalent amount.

Figure 4: Monthly Volume (AF) of Recycled Water Produced and Sold



The amount of excess recycled water available for advanced treatment and potable reuse is an important element of the project. Table 1 provides a summary of the key data and assumptions to determine that the project is expected to yield between 3,681 AF and 5,151 AF of new water supply by 2035, after accounting for an estimated 15% loss for brine waste.

Table 1: Net Available New Water Supply

Scenario 4					
Year	Supply (AF)	Supply plus Average Calculated Imported Supplement (AF)	Demand* (AF)	Gross Available Recycled Water (AF)	Net Available Recycled Water (15% brine loss) (AF)
2016	7,060 – 9,363	7,347 – 9,650	6,547	800 – 3,102	680 – 2,637
2035	10,590 – 12,320	10,877 – 12,607	6,547	4,330 – 6,060	3,681 – 5,151

*Based on the 2001-2015 average

The following studies, analyses and engineering plans have been completed for the project:

- a. Recycled Water Plan of Action (June 19, 2015)
- b. Recycled Water Basis of Design Report (September 2016)

The completion of a Title XVI feasibility study meets the goals of Title XVI funding objective of identifying and investigating opportunities to reclaim and reuse wastewater and to determine the feasibility of water reclamation and reuse projects. Potable reuse is the only local potable water supply within the service area and for every acre foot of recycled water that is beneficially used an equivalent acre foot of imported potable water is offset. Results will be demonstrated by decreased future purchases of imported water.

The JPA will provide non-Federal funding from its existing reserves supported by rate revenue and capacity fees.

III. EVALUATION CRITERIA:

a. Evaluation Criteria 1: Statement of problems and needs

First, the JPA has no natural water supplies within its watershed and boundaries. The JPA's member agencies are 100% dependent on imported water from Metropolitan Water District of Southern California. The JPA has built an extensive recycled water distribution system, beginning in the 1970s, and currently reuses 65% of its Title 22 recycled water from its Tapia Water Reclamation Facility for irrigation use. However, recycled water demands drop significantly in the cooler winter months while wastewater flows remain relatively constant. Lacking seasonal storage for the excess recycled water, the JPA releases the valuable resource to Malibu Creek, which drains to the Pacific Ocean after passing through Malibu Lagoon.

Second, discharge of treated effluent (recycled water) to receiving waters (Malibu Creek) is a practice that is not sustainable. Aside from the fact that the resource is too valuable to waste, increasingly stringent regulatory standards for water body impairments, particularly those for nutrients, cannot be achieved without advanced treatment. A 2013 U.S. EPA *Malibu Creek and Lagoon Total Maximum Daily Load for Sedimentation and Nutrients to Address Benthic Community Impairments* established new in-stream limits of 1.0 mg/L total nitrogen and 0.1 mg/L total phosphorous for Malibu Creek. These extremely low nutrient standards cannot be met with conventional wastewater treatment, even when producing Title 22 tertiary-treated recycled water. Advanced treatment, including dual-pass reverse osmosis, is required to meet the standards. As such, discharge of the excess recycled water to Malibu Creek is no longer a viable option absent treatment to drinking water standards.

Finally, the on-going, record-setting statewide drought has illustrated that imported water sources are not reliable. Further, continuing declines in the populations of Delta Smelt and Winter-Run Chinook Salmon in the Sacramento-San Joaquin Bay Delta have highlighted the fact that the ecosystem is in distress. Additionally, climate change, sea level rise, seismic activity and subsidence threaten the Delta and its functionality as the hub of California's water system. All these issues aside, importing water through the State Water Project is costly and energy intensive.

Development of new, local drought-resilient water supplies is desperately needed. The JPA has this opportunity to develop up to 5,151 acre-feet of new, local drought-resilient supply, while eliminating the discharge of recycled water to Malibu Creek to comply with new regulatory standards.

b. Evaluation Criteria 2: Water reclamation and reuse opportunities

1. How the feasibility study will investigate potential use for recycled water

The feasibility study will evaluate the potential use of recycled water for potable reuse via reservoir augmentation. In fact, the project concept is one of only three currently proposed in California. The others are proposed by the City of San Diego and Padre Dam Municipal Water District. As a result, it is an innovative project proposal.

The first step will be to conduct a thorough analysis of current, historical and future projected volumes of recycled water produced and consumed. The amount of excess recycled water available for potential potable reuse will be the difference between the amounts produced and consumed. The JPA maintains monthly recycled water production and sales data that can be analyzed. Additionally, the JPA completed a Recycled Water Master Plan Update in 2014 that can be used to project future supply and demand for recycled water.

Next, the JPA's recycled water system and potable water reservoir (Las Virgenes Reservoir) will be evaluated to determine if compliance with upcoming regulations for indirect potable reuse via reservoir augmentation can be accomplished. This process will require a careful review of draft regulations issued by the State Water Resources Control Board, Division of Drinking Water. The final regulations are expected to be issued in February or March 2017. Among the critical items are the volume of water to be purified, treatment process required, size of Las Virgenes Reservoir, estimated detention time, dilution factor, and reservoir hydrodynamics. Preliminary evaluation indicates that indirect potable reuse via reservoir augmentation is feasible.

2.3 Describe the Potential Recycled Water market

Potable reuse offers great promise because the recycled water market is drastically expanded to include potable water customers. Together, the JPA member agencies serve potable water to a population of nearly 84,000, consisting of approximately 25,000 service connection. The potable water demand for the customers is approximately 24,000 AF/year.

3.3 Describe the Sources of Water that will be investigated for potential reclamation

Excess recycled water that is currently discharged to Malibu Creek, draining to the Pacific Ocean, will be investigated as the source for reclamation. Tapia produces an average of 10,000 AF/year of recycled water. Currently, approximately 6,000 AF/year is beneficially reused for irrigation purposes, leaving 4,000 AF/year that is currently discharged to Malibu Creek for potential potable reuse. Additionally, future connections to the wastewater system are expected to generate additional sewage and, in turn, more reclamation opportunities.

c. Evaluation Criteria 3: Description of potential alternatives

1.3 Objectives of all alternatives

All alternatives evaluated with seek to address two over-arching objectives: (1) develop a new, local source of drought-resilient water supply to offset demands for imported water; and (2) effectively eliminate discharges of recycled water to Malibu Creek for compliance with new, stringent regulatory standards.

2.3 General description of the proposed project

The proposed project consists of indirect potable reuse that would produce up to 5,151 acre-feet per year of new, local, drought-resilient water supplies. The project would enable LVMWD to capture all of its unused recycled water available during winter low irrigation demand season, purify it at a new advanced water treatment plant, and augment imported drinking water supplies stored at its existing Las Virgenes Reservoir. The work would consist of engineering studies and analyses to evaluate the amount of available excess recycled water, appropriate treatment methods, regulatory requirements for indirect potable reuse via reservoir augmentation, treatment plant siting options, pipeline alignments, reservoir hydrodynamics, environmental considerations, and estimated costs and benefits. The study would leverage existing information and preliminary analyses developed through a collaborative, stakeholder-driven process to screen six alternatives to beneficially use all of the JPA's excess recycled water.

3. %Describe alternative measure of technologies

The study will evaluate a variety of alternative treatment methodologies to achieve the necessary levels of public health required for potable reuse via reservoir augmentation. Table 2 summarizes the expected treatment process standards that would be applicable.

Table 2: Treatment Process Standards

Parameter	Criteria
Pathogen Removal	8-7-8 log removal credits (enteric virus, <i>Giardia</i> , <i>Cryptosporidium</i>) using at least three treatment barriers – if dilution is 1% advanced purified water to reservoir volume
	9-8-9 log removal credits (enteric virus, <i>Giardia</i> , <i>Cryptosporidium</i>) using at least three treatment barriers – if dilution is 10% advanced purified water to reservoir volume
Oxidation	0.5 log removal of 1,4-Dioxane, minimum
Drinking Water Standards	Meet all drinking water maximum contaminant levels (MCLs) in advanced purified water; quarterly for primary MCLs; annually for secondary MCLs

*Based on NWR1 "Final Panel Meeting Report #5: Surface Water Augmentation – IPR Criteria Review", July 2, 2015.

Reverse osmosis is generally expected to serve as the central element of a multi-barrier treatment system; however, there are a variety of options available for pretreatment and advanced oxidation. For example, ultraviolet light and hydrogen peroxide are frequently used together for advanced oxidation. Alternatively, there may be value in evaluating the use of ultraviolet light and chlorine.

Aside from the treatment methodologies, the study will evaluate reclamation options that do not involve potable reuse for comparison purposes. One such option may include re-purposing Encino Reservoir for recycled water. Encino Reservoir is owned by Los Angeles Department of Water and Power and not currently in service because of challenges meeting the requirements of the Surface Water Treatment Rule.

d. Evaluation Criteria 4: Stretching Water Supplies

1. %Potential for project to reduce, postpone or eliminate new water supplies

Since the JPA's members are 100% dependent on imported water from Metropolitan Water District of Southern California for its potable water supplies, every acre foot of potable reuse will result in an acre-foot of imported potable water that is offset. Therefore, the project will permanently reduce and eliminate the need to import up to 5,151 AF annually.

2.) Describe the potential to reduce or eliminate use of existing diversions from natural water courses

The JPA's members do not divert from local, natural water courses. However, the imported water purchased by the JPA's member through Metropolitan Water District of Southern California is diverted from the strained Sacramento-San Joaquin Bay Delta. Because the project is expected to reduce the need for the JPA members to purchase up to 5,150 AF of imported water, it indirectly will reduce the diversions from the Bay Delta by the same amount.

3.) Describe the potential to reduce the demand on existing federal water supply facilities

The project proposal indirectly reduces demands on the Colorado River. Metropolitan Water District of Southern California has two major sources of water supply: (1) the State Water Project, and (2) the Colorado River. Operationally speaking, the JPA's members primarily receive water from the State Water Project. However, Metropolitan's system is well-integrated, so a reduction of demands on one source of supply can result in reduced strains on the other. For example, during a time of critical shortage on the Colorado River system, a reduction of 5,151 AF/year of demand on the State Water Project could free up an equivalent amount of State Water Project water for another water agency that otherwise would have received deliveries from the Colorado River.

e. Evaluation Criteria 5: Environment and Water Quality

1.) Potential for improve the quality of surface or groundwater

The proposed project presents the potential opportunity to treat impaired groundwater pumped by the City of Thousand Oaks, adjacent to the JPA's service area. Because the supply of excess recycled water to be treated at the JPA's proposed advanced water treatment plant is seasonally available (only during the winter low demand period), the plant will have idle capacity during the summertime when recycled water demands are highest. The City of Thousand Oaks has been studying options to utilize high salinity groundwater that was previously unused in its service area. Among the challenges for the City are the need to build a groundwater desalter and dispose of brine waste. The JPA's advanced water treatment plant would likely be capable of treating the City's impaired groundwater when sufficient capacity is available at the plant due to the lack of excess recycled water. The treated groundwater could also be conveyed and stored at Las Virgenes Reservoir and an equivalent amount of potable water could be conveyed to the City of Thousand Oaks as an exchange. Also, the JPA is proposing to construct a brine pipeline that could be utilized to dispose of the brine waste from treating the impaired groundwater.

If deemed feasible, the treatment of impaired groundwater could increase the yield of potable water supply from the project beyond 5,151 AF.

2. Potential to improve flow conditions In a natural stream channel

The project would reduce the JPA members' demands for imported water from the State Water Project by up to 5,150 AF/year and, therefore, would improve flow conditions in the Sacramento-San Joaquin Bay Delta. Currently, the Bay Delta ecosystem is in distress, partly due to reverse flow conditions in the south Delta that draw endangered fish species such as the Delta Smelt toward pumps for both the State and Federal Water Projects.

3. Provide water for federally listed threatened species

The project could potentially provide water from two federally listed endangered species: (1) Delta Smelt, and (2) Southern Steelhead. Delta Smelt were federally listed as endangered in 1993 and recent trawls in the Sacramento-San Joaquin Bay Delta have created alarm that the species is on the brink of extinction. During certain times of the year, the Delta Smelt are drawn into the south Delta by the powerful State and Federal Water Project pumps that can generate reverse flows in the Old and Middle Rivers. Once trapped in the south Delta, the Delta Smelt are vulnerable to entrainment in the pumps and/or perish due to the lack of food sources. The project would reduce the JPA members' demands on imported State Water Project delivered from the Delta by up to 5,151 AF/year. The reduction in demand would in turn reduce pumping at the Bank Pump Plant and reduce the effect of reverse flow in the Delta that are harmful to Delta Smelt. Additionally, locally, the project could provide higher quality water for Southern Steelhead. In August 1997, the National Marine Fisheries Service listed the Southern Steelhead as a federally endangered species. Malibu Creek is currently believed to be the southern-most spawning ground where Southern Steelhead have been identified. As a result, it is critical to maintain a sufficient supply of high quality water flowing in Malibu Creek, particularly during the dry summer months, to maintain refuge areas for Southern Steelhead that fail to make the journey back to the Pacific Ocean. The JPA releases recycled water to Malibu Creek during periods of low streamflow in the summer to trim the flow to 2.5 cubic feet per second. However, concerns have emerged that nutrients in the recycled water are causing algal growth and eutrophication in Malibu Creek and Lagoon, impairing the ecosystem that supports Southern Steelhead. The proposed project, through advanced treatment of recycled water, will enable the JPA to release substantially higher quality water to Malibu Creek.

f. Evaluation Criteria 6: Legal and Institutional requirements

The project could also serve to support collaboration on technical and legal disagreements with regulatory agencies regarding the application of the

2013 U.S. EPA Malibu Creek and Lagoon Total Maximum Daily Load (TMDL) for Sedimentation and Nutrients to Address Benthic Community Impairments. The JPA has expressed significant technical concerns with the 2013 TMDL, which lead to litigation between the JPA and U.S. Environmental Protection Agency in 2013. Although the litigation remains unresolved, the proposed project offers a major step forward to implement a solution that addresses the concerns of all parties. With respect to compliance with the 2013 TMDL, the project supports the JPA in effectively eliminating discharges to Malibu Creek, which will substantially reduce nutrient loading to the impaired receiving water. From a water resource management standpoint, the project will create a new, local drought-resilient water supply. There are no legal or institutional barriers related to the availability or ownership of the excess recycled water that would interfere with the project.

g. Evaluation Criteria 7: Renewable Energy and Energy Efficiency

The JPA's members currently purchase 100% of their potable water supply from Metropolitan Water District of Southern California (MWD), which is served from the Jensen Water Treatment Plant and imported from the State Water Project. For each acre-foot of water transported to and treated at Jensen, 4.09 MWh of electricity is consumed. The transmission, distribution, and advanced treatment of an acre foot of recycled water consumes an average of 2.05 MWh of electricity. As a result, for every acre foot of advanced treated recycled water that replaces an acre foot of imported water, a reduction of 2.04 MWh of electricity is realized. Therefore, the proposed project would result in a reduction of 10,508 MWh of electricity annually.

h. Evaluation Criteria 8: Watershed Perspective

According to the Malibu Creek Watershed Council, the Malibu Creek Watershed is one of the largest discrete watersheds draining into the Santa Monica Bay. Over 90,000 residents in five cities and unincorporated areas of Los Angeles County and Ventura County, call the watershed home, as do countless plant and animal species. Some animal species, such as the Southern Steelhead, Tidewater Goby and Brown Pelican are endangered. Many others, such as the Snowy Plover and Peregrine Falcon, are threatened. Protecting this watershed is important to ensure the long-term health of the ecosystem. However, increased urbanization has resulted in water quality and quantity issues. One of the action items of the council is to reduce nutrient loading from the recycled water discharged to Malibu Creek during the low irrigation demand season. The project would effectively eliminate the discharge of recycled water, and resulting nutrient loading, to Malibu Creek. Support letters for the project were submitted by many of the major watershed stakeholders.

B. REQUIRED PERMITS OR APPROVALS: ;

There are no permits or approvals needed to perform the proposed feasibility study. The JPA Board of Directors would award a contract to a successful consultant to start the work.

C. STUDY BUDGET:

I. FUNDING PLAN AND LETTERS OF COMMITMENT

The adopted Fiscal Year 2016-17 JPA Budget includes \$300,000 in funding required for the proposed feasibility study. This includes \$150,000 in funding for the JPA's required match and \$150,000 in funding that would be reimbursed by Reclamation. The funds are available from the JPA's reserves. No funding is required from a source other than the JPA. The funds are immediately available; there are no time constraints on the availability of the funding. Also, there are no other contingencies associated the funding commitment.

Table 3. Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT
Non Federal Entities	
1. Las Virgenes-Triunfo JPA	\$150,000
Non Federal Subtotal	\$150,000
Other Federal Entities	\$0
Other Federal Subtotal	\$0
REQUESTED RECLAMATION FUNDING	\$150,000

II. BUDGET PROPOSAL

Table 4 (next page) consists of the budget proposal.

Table 4: Budget Proposal

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				
Employee 1				\$0
Employee 2				\$0
Employee 3				\$0
Fringe Benefits				
Full-Time Employees				\$0
Part-Time Employees				\$0
Travel				
Trip 1				\$0
Trip 2				\$0
Equipment				
Item A				\$0
Item B				\$0
Supplies and Materials				
Item A				\$0
Item B				\$0
Contractual/Constr.				
Feasibility Study Consultant				\$200,000
Study of Reservoir Hydrodynamics				\$100,000
Other				
Other				\$0
TOTAL DIRECT COSTS				\$300,000
Indirect Costs				
Type of rate	percentage	\$base		\$0
TOTAL ESTIMATED PROJECT COSTS				\$300,000

III. BUDGET NARRATIVE

The total estimated project cost is \$300,000, which consists entirely of direct costs. The direct total direct costs are estimated to be \$300,000, consisting of two contractual service agreements that are expected to be awarded through a competitive process. The first contractual services agreement would be for the preparation of the feasibility study, in the amount of \$200,000. The second would be for the study of the reservoir hydrodynamics, in the amount of \$100,000. The two contracts are shown as being performed separately because the hydrodynamics work is specialized and requires different skills and qualification than the preparation of the feasibility study. Reservoir hydrodynamics are a critical component of the overall feasibility because the mixing and dilution of the advanced treated water must be well understood for compliance with new regulatory standards for indirect potable reuse via reservoir augmentation.

Salaries and Wages: The project manager for the feasibility study will be David Lippman, Director of Facilities and Operations. However, the cost of labor (salaries and wages) is not proposed to be utilized as agency match or reimbursed by Reclamation.

Fringe Benefits: No fringe benefits are proposed to be utilized as agency match or reimbursed by Reclamation.

Travel: No travel is proposed to be utilized as agency match or reimbursed by Reclamation.

Equipment: No equipment is proposed to be utilized as agency match or reimbursed by Reclamation.

Materials and Supplies: No materials and supplies are proposed to be utilized as agency match or reimbursed by Reclamation.

Contractual: Two contractual service agreements are expected to be awarded through a competitive process. The first contractual services agreement would be for the preparation of the feasibility study, in the amount of \$200,000. The second would be for the study of the reservoir hydrodynamics, in the amount of \$100,000. The two contracts are shown as being performed separately because the hydrodynamics work is specialized and requires different skills and qualification than the preparation of the feasibility study. Reservoir hydrodynamics are a critical component of the overall feasibility because the mixing and dilution of the advanced treated water must be well understood for compliance with new regulatory standards for indirect potable reuse via reservoir augmentation. The specific rates for the contractual services are not known at this time, but they will be reviewed for competitiveness based on comparisons with other proposals and recently completed work for similar services.

Other expenses: No other expenses are proposed to be utilized as agency match or reimbursed by Reclamation.

Indirect costs: No indirect costs are proposed to be utilized as agency match or reimbursed by Reclamation.

Total cost: The total cost of the project is estimated to be \$300,000.

APPENDIX A
LETTERS OF SUPPORT

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0044
(916) 319-2044
FAX (916) 319-2144

DISTRICT OFFICE
2301 E DAILY STREET
SUITE 200
CAMARILLO, CA 93010
(805) 482-1904
FAX (805) 482-1274

Assembly
California Legislature



JACQUI IRWIN

ASSEMBLYMEMBER, FORTY-FOURTH DISTRICT

COMMITTEES
CHAIR: VETERANS AFFAIRS
ACCOUNTABILITY AND
ADMINISTRATIVE REVIEW
AGRICULTURE
HIGHER EDUCATION
JOBS, ECONOMIC DEVELOPMENT,
AND THE ECONOMY

December 14, 2016

Mr. Terry Fulp, Regional Director
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

**RE: Pure Water Project Las Virgenes-Triunfo
Support for WaterSMART Grant Application under Title XVI Water Reclamation and Reuse
Program for Fiscal Year 2017**

Dear Mr. Fulp:

This letter is to express support for the WaterSMART grant application submitted by the Las Virgenes-Triunfo Joint Powers Authority (JPA), seeking assistance for development of a Pure Water Project to further treat recycled water for indirect potable reuse.

The project proposal was developed through a collaborative, stakeholder-driven process involving over 17 organizations with various roles in the Malibu Creek Watershed. The project would consist of a multi-agency undertaking in western Los Angeles and eastern Ventura Counties to develop a new source of local water supply, improve drought resilience, and comply with stringent regulatory standards for Malibu Creek.

All potable water in the JPA's region is imported. The JPA's member agencies, Las Virgenes Municipal Water District and Triunfo Sanitation District/Oak Park Water, have worked closely with their respective communities to achieve greater water-use efficiency with significant results. They have also distributed recycled water to irrigate parks, schools, golf courses, highway landscapes and common areas of commercial and multi-family residential properties, conserving limited potable water for its highest uses. For the last several years, some 20 percent of the water delivered by the JPA agencies was recycled.

The Pure Water Project would leverage the region's investments in recycled water to further reduce its dependence on imported water, while achieving energy savings and greenhouse gas emission reductions. The project would develop up to 5,000 acre-feet of new, local water supply through advanced treatment of excess recycled water currently released to Malibu Creek during the winter low-demand period.

We respectfully request that the JPA's application be given favorable review, which would support the region in improving its water supply reliability and drought resilience.

Sincerely,

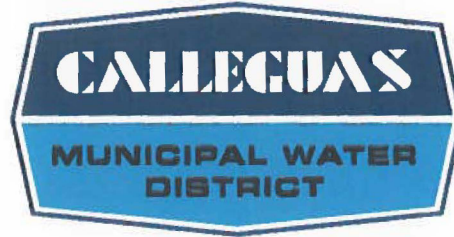
A handwritten signature in black ink, appearing to read "Jacqui Irwin".

Jacqui Irwin
Assemblymember, AD 44

SCOTT H. QUADY, PRESIDENT
DIVISION 2

ANDRES SANTAMARIA, SECRETARY
DIVISION 4

STEVE BLOIS, DIRECTOR
DIVISION 5



THOMAS L. SLOSSON, VICE PRESIDENT
DIVISION 1

ANDY WATERS, TREASURER
DIVISION 3

SUSAN B. MULLIGAN
GENERAL MANAGER

web site: www.calleguas.com

2100 OLSEN ROAD • THOUSAND OAKS, CALIFORNIA 91360-6800 805/526-9323 • FAX: 805/522-5730 • FAX: 805/526-3675

December 15, 2016

Mr. Terry Fulp, Regional Director
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

**Subject: Las Virgenes-Triunfo Pure Water Project
Support for WaterSMART Grant Application under Title XVI Water
Reclamation and Reuse Program for Fiscal Year 2017**

Dear Mr. Fulp:

We are writing to express support for the WaterSMART grant application submitted by the Las Virgenes-Triunfo Joint Powers Authority (JPA), seeking assistance for development of a Pure Water Project to further treat recycled water for indirect potable reuse.

The project proposal was developed through a collaborative, stakeholder-driven process involving over 17 organizations with various roles in the Malibu Creek Watershed. The project would consist of a multi-agency undertaking in western Los Angeles and eastern Ventura Counties to develop a new source of local water supply, improve drought resilience, and comply with stringent regulatory standards for Malibu Creek.

All of the potable water in the JPA's region comes from the California Water Project and must travel through the ecologically impaired Sacramento-San Joaquin Delta. In fact, the JPA's region is one of the few in Southern California that can only receive very limited quantities of Colorado River supplies. As a result, the region is more vulnerable to lengthy outages resulting from seismic damage in the Delta or along the California Aqueduct than any other.

The JPA's member agencies, Las Virgenes Municipal Water District and Triunfo Sanitation District/Oak Park Water, have worked closely with their respective communities to achieve greater water use efficiency with significant results. They have also distributed recycled water to irrigate parks, schools, golf courses, highway landscapes and common areas of commercial and multi-family residential properties, conserving limited potable water for its highest uses.

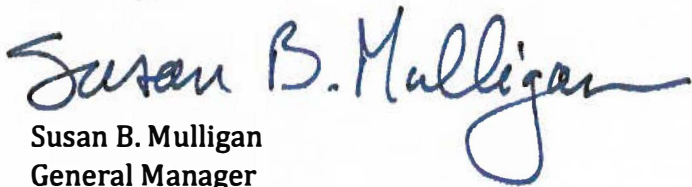
Mr. Terry Fulp
December 15, 2016
Page 2

For the last several years, approximately 20 percent of the water delivered by the JPA agencies was recycled.

The Pure Water Project would leverage the region's investments in recycled water to further reduce its dependence on imported water, while achieving energy savings and reductions in greenhouse gas emissions. The project would develop up to 5,000 acre-feet of new, local water supply through advanced treatment of excess recycled water currently released to Malibu Creek during the winter low-demand period.

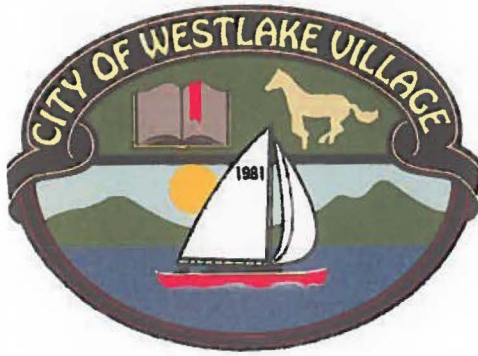
We respectfully request that the JPA's application be given favorable review, which would support the region in improving its water supply reliability and drought resilience.

Sincerely,

A handwritten signature in blue ink that reads "Susan B. Mulligan". The signature is fluid and cursive, with a long horizontal stroke at the end.

Susan B. Mulligan
General Manager

cc: David W. Pedersen, Administering Agent/General Manager, Las Virgenes-Triunfo JPA
Mark Norris, General Manager, Triunfo Sanitation District



BRAD HALPERN
Mayor

MARK RUTHERFORD
Mayor Pro Tem

NED E DAVIS
Councilmember

KELLY HONIG
Councilmember

SUSAN McSWEENEY
Councilmember

December 14, 2016

Mr. Terry Fulp, Regional Director
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

**RE: Pure Water Project Las Virgenes-Triunfo
Support for WaterSMART Grant Application under Title XVI Water
Reclamation and Reuse Program for Fiscal Year 2017**

Dear Mr. Fulp:

This letter is to express support for the WaterSMART grant application submitted by the Las Virgenes-Triunfo Joint Powers Authority (JPA), seeking assistance for development of a Pure Water Project to further treat recycled water for indirect potable reuse.

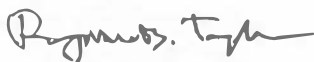
The project proposal was developed through a collaborative, stakeholder-driven process involving over 17 organizations with various roles in the Malibu Creek Watershed. The project would consist of a multi-agency undertaking in western Los Angeles and eastern Ventura Counties to develop a new source of local water supply, improve drought resilience, and comply with stringent regulatory standards for Malibu Creek.

All potable water in the JPA's region is imported. The JPA's member agencies, Las Virgenes Municipal Water District and Triunfo Sanitation District/Oak Park Water, have worked closely with their respective communities to achieve greater water-use efficiency with significant results. They have also distributed recycled water to irrigate parks, schools, golf courses, highway landscapes and common areas of commercial and multi-family residential properties, conserving limited potable water for its highest uses. For the last several years, some 20 percent of the water delivered by the JPA agencies was recycled.

The Pure Water Project would leverage the region's investments in recycled water to further reduce its dependence on imported water, while achieving energy savings and greenhouse gas emission reductions. The project would develop up to 5,000 acre-feet of new, local water supply through advanced treatment of excess recycled water currently released to Malibu Creek during the winter low-demand period.

We respectfully request that the JPA's application be given favorable review, which would support the region in improving its water supply reliability and drought resilience.

Sincerely,



Raymond B. Taylor
City Manager

cc: David W. Pedersen, Administering Agent/General Manager, Las Virgenes-Triunfo JPA



CITY *of* CALABASAS

December 15, 2016

Mr. Terry Fulp, Regional Director
U.S. Bureau of Reclamation, Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

**RE: PURE WATER PROJECT LAS VIRGENES-TRIUNFO
SUPPORT FOR WATERSMART GRANT APPLICATION UNDER TITLE XVI
WATER RECLAMATION AND REUSE PROGRAM FOR FISCAL YEAR 2017**

Dear Mr. Fulp:

This letter is to express support for the WaterSMART grant application submitted by the Las Virgenes-Triunfo Joint Powers Authority (JPA), seeking assistance for development of a Pure Water Project to further treat recycled water for indirect potable reuse.

The project proposal was developed through a collaborative, stakeholder-driven process involving over 17 organizations with various roles in the Malibu Creek Watershed. The project would consist of a multi-agency undertaking in western Los Angeles and eastern Ventura Counties to develop a new source of local water supply, improve drought resilience, and comply with stringent regulatory standards for Malibu Creek.

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100 Civic Center Way, Calabasas, CA 91302
Tel: (818) 224-1600 Fax: (818) 225-7338
<http://www.cityofcalabasas.com/>



CITY of CALABASAS

The Pure Water Project would leverage the region's investments in recycled water to further reduce its dependence on imported water, while achieving energy savings and greenhouse gas emission reductions. The project would develop up to 5,000 acre-feet of new, local water supply through advanced treatment of excess recycled water currently released to Malibu Creek during the winter low-demand period.

City of Calabasas respectfully requests that the JPA's application be given favorable review, which would support the region in improving its water supply reliability and drought resilience.

Sincerely,

Alex Farassati, Ph.D.

Environmental Services Manager

cc: David W. Pedersen, Administering Agent/General Manager, Las Virgenes-Triunfo JPA



"Gateway to the Santa Monica Mountains National Recreation Area"

December 14, 2016

Mr. Terry Fulp, Regional Director
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, NV 89006-1470

**RE: Pure Water Project Las Virgenes-Triunfo
Support for WaterSMART Grant Application under Title XVI Water Reclamation and
Reuse Program for Fiscal Year 2017**

Dear Mr. Fulp:

This letter is to express the City of Agoura Hills' support for the WaterSMART grant application submitted by the Las Virgenes-Triunfo Joint Powers Authority (JPA), seeking assistance for development of a Pure Water Project to further treat recycled water for indirect potable reuse.

The project proposal was developed through a collaborative, stakeholder-driven process involving over 17 organizations with various roles in the Malibu Creek Watershed. The project would consist of a multi-agency undertaking in western Los Angeles and eastern Ventura Counties to develop a new source of local water supply, improve drought resilience, and comply with stringent regulatory standards for Malibu Creek.

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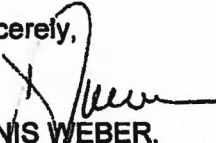
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**Mr. Terry Fulp, Regional Director
U. S. Bureau of Reclamation**

**RE: Pure Water Project Las Virgenes-Triunfo
December 14, 2016
Page Two**

We respectfully request that the JPA's application be given favorable review, which would support the region in improving its water supply reliability and drought resilience.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Weber', written over the printed name.

**DENIS WEBER,
Mayor, City of Agoura Hills**

**cc: David W. Pedersen, Administering Agent/General Manager
Las Virgenes-Triunfo Joint Powers Authority (JPA)**



City of Hidden Hills

6165 Spring Valley Road • Hidden Hills, California 91302
(818) 888-9281 • Fax (818) 719-0083

December 16, 2016

Mr. Terry Fulp, Regional Director
U.S. Bureau of Reclamation
Lower Colorado Region
P.O. Box 61470
Boulder City, Nevada 89006-1470

**RE: Pure Water Project Las Virgenes-Triunfo
Support for WaterSMART Grant Application under Title XVI Water Reclamation and Reuse Program for
Fiscal Year 2017**

Dear Mr. Fulp:

This letter is to express support for the WaterSMART grant application submitted by the Las Virgenes-Triunfo Joint Powers Authority (JPA), seeking assistance for development of a Pure Water Project to further treat recycled water for indirect potable reuse.

The project proposal was developed through a collaborative, stakeholder-driven process involving over 17 organizations with various roles in the Malibu Creek Watershed. The project would consist of a multi-agency undertaking in western Los Angeles and eastern Ventura Counties to develop a new source of local water supply, improve drought resilience, and comply with stringent regulatory standards for Malibu Creek.

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We respectfully request that the JPA's application be given favorable review, which would support the region in improving its water supply reliability and drought resilience.

Sincerely,

Kerry Kallman
City Manager

cc: David W. Pedersen, Administering Agent/General Manager, Las Virgenes-Triunfo JPA

APPENDIX B
OFFICIAL RESOLUTION

RESOLUTION NO. 2504

A RESOLUTION OF THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT AUTHORIZING THE GENERAL MANAGER TO ENTER INTO AGREEMENTS FOR FUNDING WITH THE UNITED STATES DEPARTMENT OF INTERIOR BUREAU OF RECLAMATION FOR WATERSMART: DEVELOPMENT OF FEASIBILITY STUDIES UNDER THE TITLE XVI WATER RECLAMATION AND REUSE PROGRAM FOR FISCAL YEAR 2017

BE IT RESOLVED BY THE BOARD OF DIRECTORS OF LAS VIRGENES MUNICIPAL WATER DISTRICT as follows:

1. Purpose

General Manager David W. Pedersen, is authorized and directed to apply for a grant under the WaterSMART Development of Feasibility Studies under the Title XVI Water Reclamation and Reuse Program for Fiscal Year 2017 and enter into agreements with the United States Department of Interior Bureau of Reclamation for the grant when and if such grant is awarded. General Manager David W. Pedersen has reviewed and supports the application to be submitted for the Pure Water Project Las Virgenes – Triunfo Demonstration Project.

2. Available Funding

The District can provide in-kind contributions and funding from existing reserves, as required by the Act, for fifty percent (50%) or more of the total study costs.

3. Cooperative Agreement

The District shall cooperate with the Bureau of Reclamation to meet deadlines for entering into a cooperative agreement.

PASSED, APPROVED AND ADOPTED on January 10, 2017.

Glen Peterson, President

ATTEST:

Jay Lewitt, Secretary

(SEAL)

Approval expected on January 10, 2017 and will be forwarded to Reclamation.

APPROVED AS TO FORM:

Wayne K. Lemieux, District Counsel