



Inyo-Mono

INTEGRATED REGIONAL WATER MANAGEMENT PROGRAM

Inyo-Mono IRWM Water Supply, Reliability, and Conservation Implementation Proposal

Attachment 2. Project Justification

Introduction

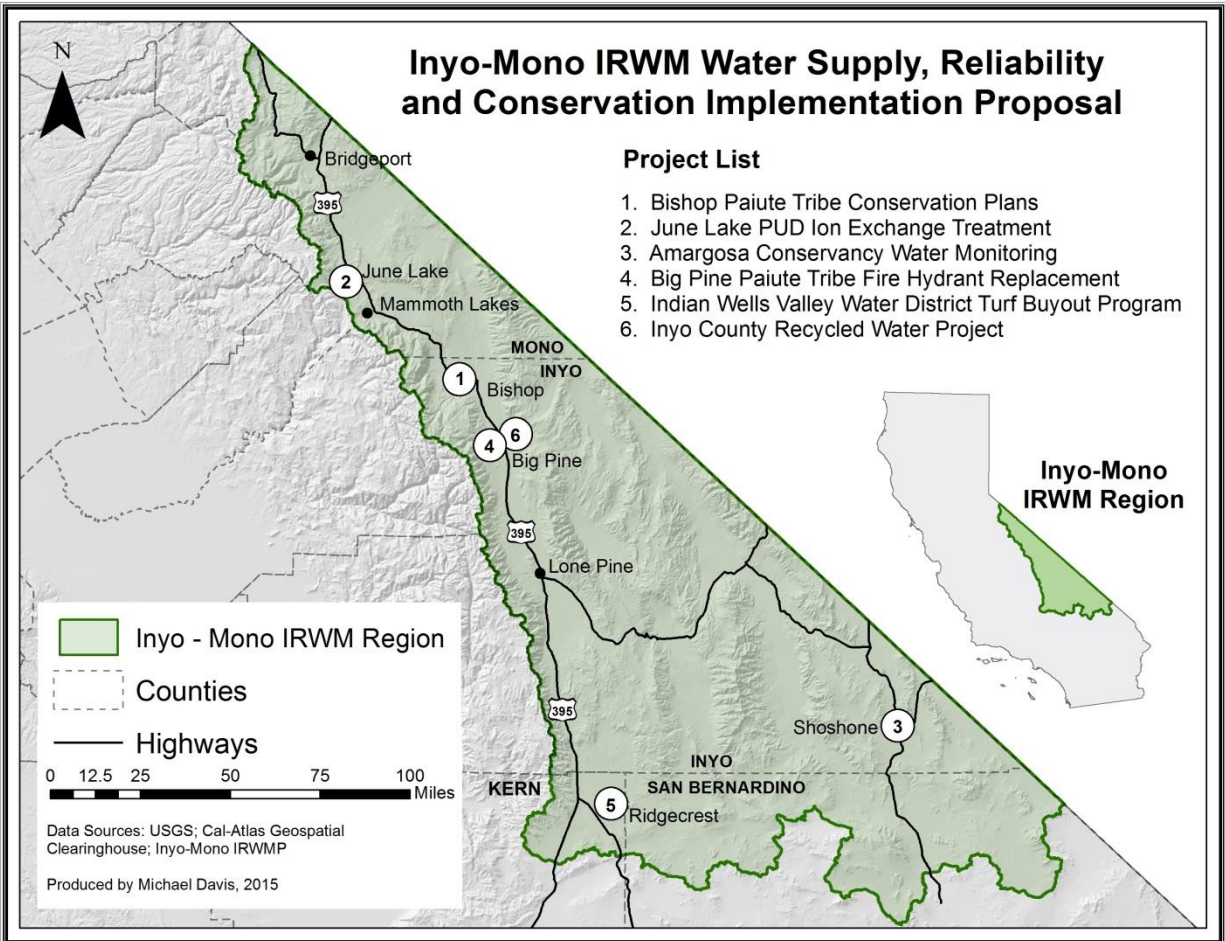
The Inyo-Mono IRWM Water Supply, Reliability, and Conservation Implementation Proposal is comprised of a total of seven projects, including grant administration. All projects reflect a regional desire to achieve regional self-reliance and sustainable water resources management. The portfolio of projects include: (1) Grant Administration, (2) Bishop Paiute Tribe Domestic Water, Irrigation, and Wastewater Conservation Plans, (3) June Lake Public Utility District Uranium Removal Plant, (4) Amargosa Basin Water, Ecosystem Sustainability, and Disadvantaged Community Project, (5) Big Pine Tribal Fire Hydrant Replacement Project, (6) Ridgecrest Cash-for-Grass Landscape Rebate Incentive Program, (7) Recycled Water for Restoration and Community Projects in Big Pine.

In addition to the requisite Project Summary Table and Regional Map, Attachment 3 contains a detailed project description, estimated physical benefits, technical justification of claimed benefits, direct water-related benefits to a DAC, project performance monitoring plan and cost-effectiveness analysis for each project. This attachment is organized to first provide the project summary table and the regional project map, followed by the project information listed above.

Project Summary Table

Table 4 – 2015 IRWM Grant Solicitation Project Summary Table								
IRWM Project Element		Bishop Paiute Conservation Plan	June Lake PUD Uranium Removal Plant	Amargosa Basin Water, Ecosystem Sustainability and Disadvantaged Community Project	Big Pine Tribal Fire Hydrant Replacement Project	Ridgecrest Cash-for-Grass Landscape Incentive Program	Recycled Water Projects for Restoration and Community Projects in Big Pine	Grant Administration
IR.1	Water supply reliability, water conservation, and water use efficiency	x	x	x	x	x	x	n/a
IR.2	Stormwater capture, storage, clean-up, treatment, and management							n/a
IR.3	Removal of invasive non-native species, the creation and enhancement of wetlands, and the acquisition, protection, and restoration of open space and watershed lands							n/a
IR.4	Non-point source pollution reduction, management, and monitoring							n/a
IR.5	Groundwater recharge and management projects					x		n/a
IR.6	Contaminant and salt removal through reclamation, desalting, and other treatment technologies and conveyance of reclaimed water for distribution to users							n/a
IR.7	Water banking, exchange, reclamation, and improvement of water quality		x					n/a
IR.8	Planning and implementation of multipurpose flood management programs							n/a
IR.9	Watershed protection and management			x	x			n/a
IR.10	Drinking water treatment and distribution	x	x					n/a
IR.11	Ecosystem and fisheries restoration and protection			x			x	n/a

Regional Map



Project 2. Bishop Paiute Tribe Domestic Water, Irrigation, and Wastewater Conservation Plans

Implementing Agency: Bishop Paiute Tribe

Project Description

Short: This project will develop comprehensive water conservation plans for irrigation, domestic water, and wastewater, as well as a rate study for the Bishop Paiute Tribe.

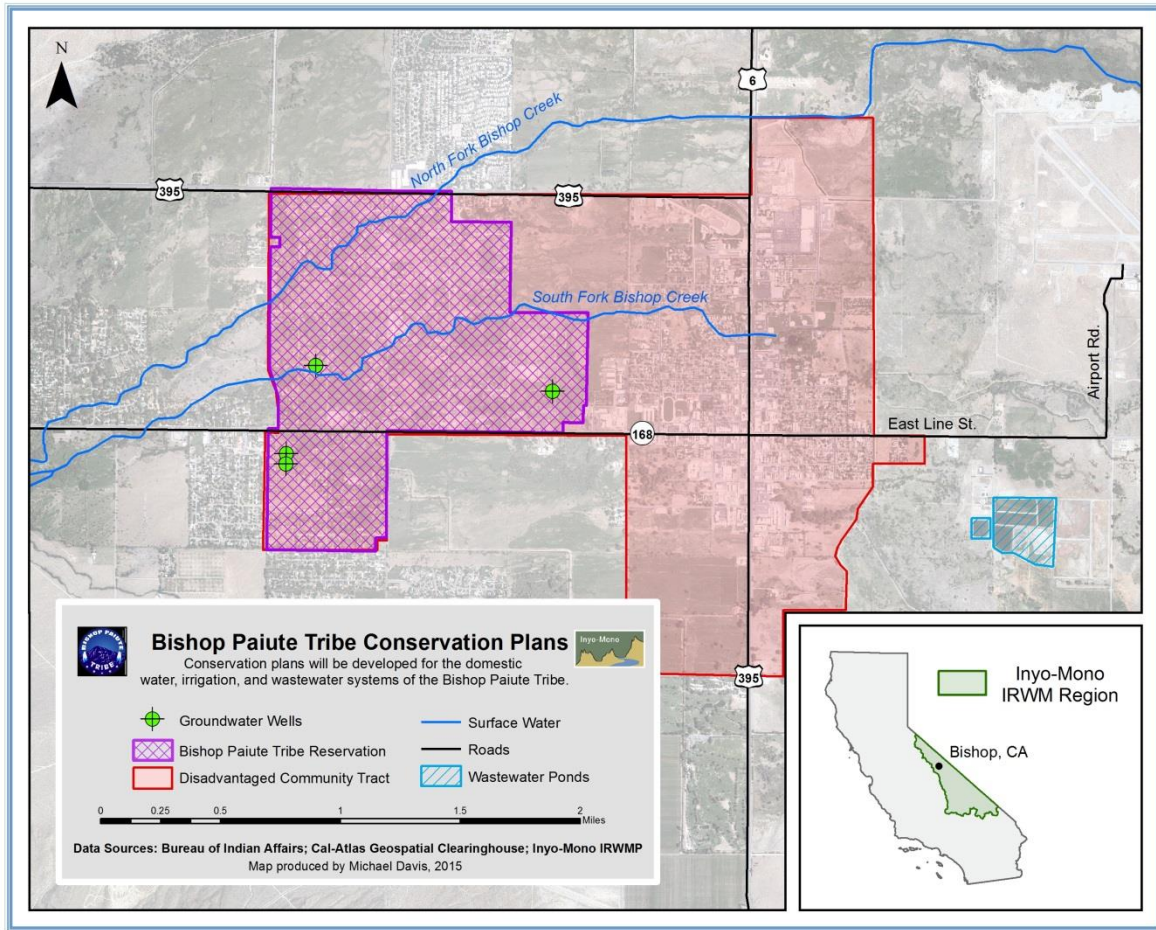
Long: The Bishop Paiute Tribe, a disadvantaged community (DAC) and federally-recognized Native American Indian Tribe, seeks to improve management of its water resources, one of the goals of which is conservation of the Reservation's surface water flow from the Bishop Creek watershed and supply from groundwater sources. Through the proposed project, a sub-contracted Civil Engineer who understands the Bishop Paiute Tribe's water sources and water delivery protocols will be hired to complete a comprehensive water conservation plan that will guide and prioritize long-term water resource management needs for the Tribe. This conservation plan will consist of three focal areas within the Tribe's water management system: irrigation, domestic water, and wastewater. In addition, the plan will include a rate study that will facilitate a tiered rate structure to be implemented for the Tribe's long-term management of its water resources. The conclusion of the conservation plan will propose a series of improvements needed to better manage the Tribe's water resources.

The Bishop Paiute Reservation's 70+-year-old domestic water, irrigation, and sewer systems are in need of repair and rehabilitation, and the Tribe is seeking the most efficient and cost-effective way to improve these systems in order to conserve water while providing for the Reservation's residential and business needs. The Bishop Paiute Reservation receives its irrigation water from the watershed of Bishop Creek, which runs east from the Sierra Nevada into the Owens Valley, where the Reservation is located. After the water runs through the Bishop Paiute Reservation, it enters City of Bishop, the City of Los Angeles Department of Water and Power jurisdiction, and the Owens River. This project effectively addresses long-term drought preparedness because the usage of millions of gallons of irrigation and domestic water over the years could be reduced through conservation efforts that will result from the plan. Electricity use will be reduced because of the reduction in groundwater pumping by the Tribe and the reduction in wastewater treatment by the Eastern Sierra Community Services District.

Currently, the Bishop Paiute Reservation sustains 608 residential water hook-ups, which include five mobile home parks with one meter each (approximately 60 units), and 31 commercial customers, which include two apartment buildings (38 units with 13 meters), Tribal offices/ departments, a gas station, a casino, plus leaseholders such as the Owens Valley Career Development Center (six buildings with one meter), Toiyabe Indian Health Project, Inc. clinic and offices, the California Department of Motor Vehicles, and the US Forest Service/Bureau of Land Management federal building. Domestic water is provided via groundwater wells; irrigation water is provided via a ditch and pipeline system fed from the Bishop Creek watershed; and wastewater service is provided through Eastern Sierra Community Services District.

Addressing the needs of DACs throughout the Inyo-Mono planning region is an identified objective within the Inyo-Mono IRWM Plan. Moreover, managing limited water resources to ensure adequate supplies for domestic purposes, especially during drought periods, is critical to regional self-reliance and water resource sustainability. Completion of these conservation plans supports all of these objectives and priorities as determined by the Inyo-Mono RWMG.

Project Map



Project Physical Benefits

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a presentation of quantifiable benefits is not required. However, a qualitative description of the proposed work and anticipated benefits of the project upon completion of a subsequent phase is included below in table form. Note, at this time, subsequent construction project(s) resulting from this project's outcomes are very likely, but the exact nature and scope of such projects are unknown at this time. Additionally, outcomes from this project will most likely result in policy and management decisions being implemented to ensure the long-term management of tribal water resources.

System	Probable Needs	Possible Solutions	Anticipated Benefits
Irrigation	Lining of ditches to prevent infiltration to conserve water; improved irrigation practices	Lining of ditches to prevent infiltration and conserve water; installation and use of improved irrigation practices/technology; yard hydrants; use of reclaimed irrigation water instead of not domestic groundwater; water conservation education	Increase water availability due to ditch water and groundwater conservation; decrease electrical use and costs; reduction of GHG emissions

System	Probable Needs	Possible Solutions	Anticipated Benefits
Domestic	Water fixture replacement; Leak sealing; water meters; antiquated infrastructure upgrades	Leak detection and water fixture replacement; Leak sealing; water meters	Increase water availability due to ditch water and groundwater conservation; decrease electrical use and costs; reduction of GHG emissions
Wastewater	Wastewater rate study; leak infiltration detection	Revised rate structure; Replacement of antiquated wastewater lines following leakage detection	Adequate funding to plan the system; decrease waste water; increased operating efficiency; curtailed odors; reduced potential contamination of soil and water

Technical Analysis of Physical Benefits Claimed

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of DAC and not intending to complete construction with this solicitation. As such, only an explanation of why the proposed project is needed is provided below addressing Item 1 within the section of the PSP.

The people of the Bishop Paiute Tribe have occupied the Owens Valley and surrounding areas since time immemorial and practiced irrigated agriculture long before the first European contact. A 1912 Executive Order set aside over 67,000 acres for the Bishop and Big Pine Reservations. But in 1939 the Secretary of the Interior authorized the exchange of Indian land and water, including abundant water from Sierra Nevada runoff, for land owned by the city of Los Angeles in Mono and Inyo counties. Three thousand acres of trust property were exchanged for 1,400 valley acres, ending the Indian ranching and farming economies. Other land exchanges occurred, and the total acreage held in trust for the Bishop Paiute Tribe now totals only 879 acres.

Water, and the purity of water, is very important to the Paiute people for its use in ceremony and cultural activities, as well as for economic growth and self-reliance, and most importantly, for the health of the people. Elders, infants, and those with immune deficiencies are more vulnerable to water pollutants and contaminants. The continuing drought and climate change is negatively impacting water supplies, habitats as well as plants and animals of significance to the Bishop Paiute people. There has been a loss of wetland ecosystem in the Tribe's commercial park/Conservation Open Space Area between 1995 and the present, documented by repeated botanical surveys. The water shortage has affected irrigation delivery and domestic water pumping. The irrigator has had to change rotation schedules because of the shortage.

The Bishop Paiute Tribe would like to ensure that it is using its water efficiently and effectively as well as protecting the health and quality of life of tribal residents. The current severe drought has not only affected the watershed supply for irrigation but also groundwater supplies for domestic use. The irrigation, domestic, and wastewater systems need to be assessed to implement long-term planning and management of the Reservation's increasingly scarce water resources. A comprehensive water conservation plan is critical to achieve long-term water sustainability on the Reservation. The proposed project will address the three main components of the Reservation's water system: irrigation, domestic water, and wastewater. Additionally, the project will complete a water-rate study to determine appropriate water rates for domestic water and irrigation uses. Doing so will facilitate adequate funding for infrastructure, operations & management as well as the establishment of a capital improvement fund.

Irrigation: Half of the Reservation is irrigated by 70-year old pipes. This project will develop a plan for leak assessment and replacement. Pipe replacement will decrease the likelihood of contamination. Irrigation

ditches are unlined, allowing seepage and thus, wasted water. The plan will examine soil types, compare advantages and disadvantages of various types of liners, examine the best slope angle, and compare material and installation costs. A seepage rate may be conducted using a ponding test to judge increased water availability. The ditch improvement and sloping will decrease soil erosion and increase bank stability. Various improved irrigation techniques will be explored including installation of yard hydrants and reclaiming irrigation water rather than using groundwater for landscaping purposes. The hydrants will also provide freeze protection. The cost and benefits of these innovations will be included in the plan to demonstrate increased operational efficiency. Based on the outcome of this portion of the larger conservation plan, it is expected that water resources will be used in a more conservation-oriented manner.

Domestic: The estimates for current usage were based on the South Lahontan region's usage per person shown on DWR 2013 usage map of 272 gpd (http://www.mercurynews.com/science/ci_25090363/california-drought-water-use-varies-widely-around-state, <http://i0.wp.com/mavensnotebook.com/wp-content/uploads/2013/08/Slide-5.jpg>). This number was multiplied by 1,796 reservation residents (census.gov ACS 2008-2013 data), and multiplied by 365 days per year (178,306,80 gpd = 547.2 acre feet per year, <http://www.convertunits.com/from/gallons/to/acre+foot> or http://earthsci.fullerton.edu/laton/Groundwater_Resources/Common_Conversions.html) to determine out the Tribe's annual groundwater usage. Future years' acre feet are based on an annual .07% population increase (World Bank table <http://data.worldbank.org/indicator/SP.POP.GROW>) after the 2016 baseline of 1,796 for 2013 ACS data). By 2035, the Tribe's water usage may be 624.6 acre-feet per year if no measures are taken to conserve groundwater.

According to a recent electricity consumption review by Southern California Edison, the Tribe used 446,173 kW of electricity in 2014 to pump water, which cost the Tribe \$73,648.08. The Tribe also pays for wastewater treatment conducted by the Eastern Sierra Community Services District and is limited to 315,000 gallons per day of output. Conserving water at the source will help the Tribe meet its current residential, commercial, and governmental needs. It will also ensure that the Tribe stays within its allotted amount of wastewater output. Conservation may allow for future commercial projects that will aid the financial self-sufficiency of the Tribe by making available groundwater for these pursuits. Fixture, pipe, and valve replacement will decrease the likelihood of contamination and ingestion of pipe erosion products, increase water quality, and increase the quality of life, health and well-being of tribal members. Eventually, reduced water use and electric consumption from behavioral changes due to metering will have economic benefits to the Tribe and increase the operating efficiency of the system.

Wastewater: The Tribe currently has a contract with the Eastern Sierra Community Services District (ESCSA) for wastewater service. The Tribe is allowed an allotment of 315,000 gallons per day of wastewater. It is unlikely that this allotment will be increased (and increasing it will require a higher payment for services) because the ESCSD has a limited capacity in its treatment ponds, located approximately 3 miles east-southeast of the Reservation.

In the past, during overflow of surface water during rain-on-snow and flooding events, water has infiltrated the Tribe's wastewater system and thus, increased the amount of wastewater. Repairing leaks and sources of infiltration would eliminate non-wastewater sources from entering the wastewater system and therefore helping to maintain the Tribe's ability to meet its wastewater quota.

A leak, infiltration, and flow survey will allow the Tribe to determine presence and scale of leaks in the wastewater system. These leaks could then be addressed in the project(s) that will result from this plan. Preventing infiltration by detecting/fixing leaks will ensure that no excess wastewater is produced. Less wastewater to treat means less electricity and water that the ESCSD has to spend on treatment; however, figures for these savings are unknown at this time. In addition, any allotment that is not used because of stopping leaks might be used for future Tribal commercial ventures that will contribute to the Tribe's financial self-sufficiency.

Rate Study: Defining and implementing water rates to offset Public Works costs and to achieve financial sustainability of the water systems on the Reservation will occur in conjunction with the three conservation

plans described above. A rate study will be conducted for the domestic water and wastewater systems on the Reservations. Elements of this analysis will include:

- Comparing cost of operations with actual water use
- Investigating potential rate structures and determining break-even point
- Projecting changes in water use with population expansion, drought, and future development on the Reservation

A proposed rate structure will be developed, and at least two public hearings will be held regarding the suggested rates. After the hearings, public comments will be summarized, adjustments will be made as needed, and a Tribal Ordinance will be prepared. Rate structures for the domestic water and wastewater systems will then be administered.

Direct Water-Related Benefits to a DAC

The Tribe seeks to be self-sufficient, and economic pursuits are stifled by the limitations that result from poor water-related operational systems. Because this is a disadvantaged indigenous community, in addition to economic challenges, the Tribe faces a challenge to its entire culture that is centered around water. Reliance on plants for food, medicine, spirituality, and cultural lifeways makes water availability and affordability of paramount importance.

The Reservation's 70+-year-old domestic, irrigation, and sewer systems are in need of repair and rehabilitation. Currently, there are known leaks, antiquated infrastructure, and over-exploitation of water resources for both domestic and irrigation purposes. This project will provide the basis for improving water conservation, management and the efficient use of water resources via the completion of four-sub studies (irrigation, domestic, wastewater, plus a rate study). Collectively, the project will provide the basis for implementing projects that will conserve and improve water resources for the Tribe as well as contribute to economic development. The project area is part of a disadvantaged community Census Tract as listed on the DWR mapping tool. One hundred percent of the project service area (by population and geography) will benefit a water-related need of a DAC.

Project Performance Monitoring Plan

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a Project Performance Monitoring Plan is not required per the PSP.

Cost-Effectiveness Analysis

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a Cost Effectiveness Analysis is not required per the PSP.

Project 3. June Lake Public Utility District Uranium Removal Plant

Implementing Agency: June Lake Public Utilities District

Project Description

Short: The June Lake PUD's project will install an ion exchange unit to treat and remove uranium to improve water quality and domestic water supplies.

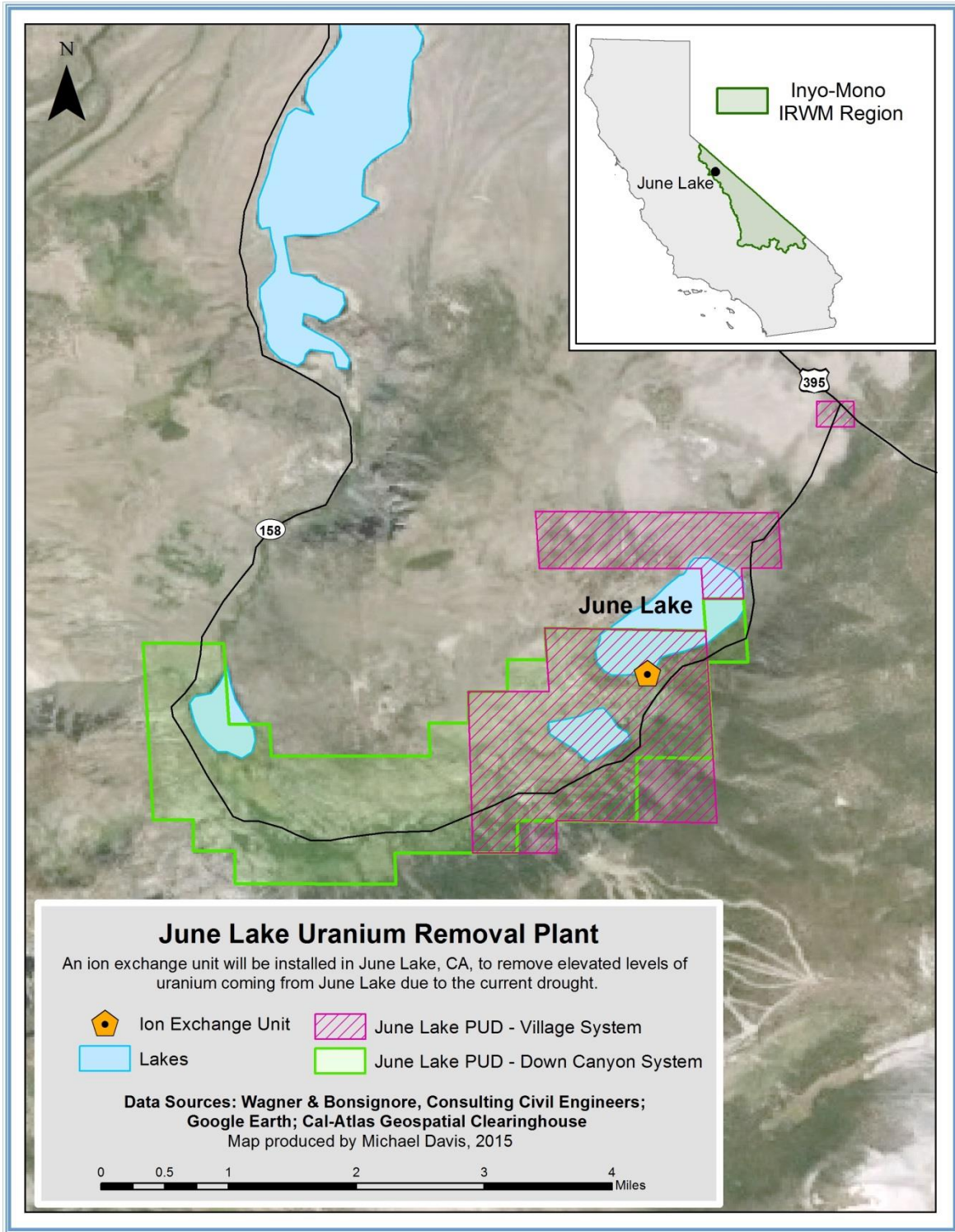
Long: The June Lake Public Utility District ("District" or "PUD") is confronted with a water quality, and in turn a significant water supply, issue as it relates to the uranium content in June Lake, which is an approved surface water source for the District. Over the last three years, the District has seen uranium test results in exceedance of what the State allows, which is 20 pCi/L. Currently, uranium in the domestic water supply tests at about 24 pCi/L. District officials believe the more concentrated uranium is a result of reduced lake levels due to the ongoing drought conditions and decomposing natural materials within the lake. If the drought continues, uranium levels in June Lake would presumably continue to increase. The District has attempted to blend water from a secondary water treatment plant with the June Lake water treatment plant to reduce the uranium content. Blending has worked for the short term; however, if the secondary plant is offline for any reason, the District would be forced to use only the June Lake plant with the uranium content in exceedance of the State standard.

The June Lake Public Utility District is proposing to install an ion exchange unit that would connect to the incoming raw water supply from June Lake, process the raw water through the ion exchange filtration system and then through the normal microfiltration process, and subsequently pump the water to the storage tank for domestic use. The District is required to install an ion exchange system that can treat raw water at a rate that matches the current microfiltration rate (approximately 200 gallons per minute) in order to adequately supply domestic and commercial use within June Lake. This project requires an amended special use permit from the US Forest Service to allow the District to install the 20' x 8' x 9.5' container (or pod) adjacent to the existing June Lake water treatment plant. The pod is a self-contained unit that houses all of the ion exchange equipment and requires a small construction footprint and minimal setup. The District would also need to amend its current standard operating plan for the June Lake water treatment plant to include the use of the ion exchange system. The District would also need to seek approval from the State Water Resources Control Board for the new standard operating procedure. It is expected that this project would be exempt from CEQA through a categorical exemption. The project is subject to NEPA since the water treatment plant is located on U.S. Forest Service land, although the project may be exempt because it would be a modification to an existing US Forest Service permit.

The June Lake Public Utility District is a small water purveyor for a rural community in eastern California that is driven largely on seasonal tourism. The District must be able to provide a reliable and clean water supply during times of peak demand in the summer and the winter, regardless of drought conditions. Currently, the District relies entirely on surface water for its domestic and commercial water supply and does not have the ability to supplement with groundwater. Ensuring adequate water quantity is already a challenge. Therefore, it is important to be able to ensure that the surface water supply meets all state and federal water quality regulations.

Protecting and conserving reliable water supplies (and quality) to communities throughout the Inyo-Mono IRWM Region is an identified objective within the Inyo-Mono IRWM Plan. This project will result in an improved, more reliable and safer drinking water supply for the community of June Lake and therefore is addressing an identified regional need.

Project Map



Project Physical Benefits

Table 5 – Annual Project Physical Benefits - Primary			
Project Name: June Lake Public Utility District Uranium Removal Plant			
Type of Benefit Claimed: Reliably Treated Water Supply -Primary			
Units of the Benefit Claimed: Acre Feet			
Anticipated Useful Life of Project (years) 30-40 Years			
(a)	(b)	(c)	(d)
Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project (c) - (b)
2015	0	521	521
2016	0	521	521
2017	0	521	521
Etc. through Last Year of Project Life	0	521	521
Total Savings		15,630 AF	
Comments: The primary benefit to the District is total amount of water treated. Without the uranium treatment pod, total production is 0AFY, with the uranium treatment pod, total production would be 521 acre feet/year. The life expectancy for this project is between 30-40 years. Using a conservative figure of 30 years, total amount of reliably available treated water supply for the life of the project is 15,630 AF.			

Table 5 – Annual Project Physical Benefits - Secondary			
Project Name: June Lake Public Utility District Uranium Removal Plant			
Type of Benefit Claimed: Water Quality			
Units of the Benefit Claimed : Uranium Level Less than 20 pCi/L			
Anticipated Useful Life of Project (years) 30-40 Years			
(a)	(b)	(c)	(d)
Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project (c) - (b)
2015	24 pCi/L	16 pCi/L	8 pCi/L
2016	24 pCi/L	16 pCi/L	8 pCi/L
2017	24 pCi/L	16 pCi/L	8 pCi/L
Etc. through Last Year of Project Life	24 pCi/L	16 pCi/L	8 pCi/L
Comments: The secondary benefit to the District is water quality. Without the uranium treatment pod the uranium levels exceed State requirements of 20pCi/L, with the uranium treatment pod, treated water uranium content level is expected to be 16 pCi/L or less.			

Technical Analysis of Physical Benefits Claimed

Water Supply

The June Lake Public Utility District is proposing to install an ion exchange unit that would connect to the incoming raw water supply from June Lake. The June Lake Water Treatment Plant is a surface water treatment plant designed to treat June Lake raw water to comply with drinking water regulations. The plant is rated at 200 gpm. Raw water is from three lake intakes, two of which feed the plant directly and one that supplies a rock filled basin with two raw boosters. Raw water from the combined header is strained in a 2-micron filter before treatment at the two membrane trains. The plant utilizes submerged polyvinylidene fluoride (PVdF) Siemens/Memcor S10V ultrafiltration membrane technology for surface water treatment. No chemical pre-treatment is utilized. Liquid chlorine is added for disinfection at the plant's effluent. The plant includes a clean-in-place system which uses citric acid and chlorine to clean the membrane units as needed.

Recently the District has consulted with an organization that manufactures a treatment pod for uranium removal. The treatment pod can be connected to the existing filtration plant. The pod operates solely on water flow throughput (no electricity required) and will capture the uranium molecules through the ion exchange process.

During ion exchange treatment, water is passed through a resin containing exchangeable ions. Stronger binding ions displace weaker binding ions and are removed from the water. There are two types of ion exchange—anion exchange and cation exchange. Anion exchange resins generally exchange chloride for anionic contaminants, like uranium. Cation exchange resins generally exchange sodium or potassium for cationic contaminants, such as radium. Mixed bed resins with cation and anion exchange media in two layers are available for systems that need to remove both radium and uranium. Ion exchange is also effective for the removal of beta particles and photon emitters.

Ion exchange has been identified by EPA as a “best available technology” (BAT) and Small System Compliance Technology (SSCT) for radium, uranium, gross alpha, and beta particle and photon emitters. It can remove up to 99 percent of these contaminants depending on the resin, pH, and competing ions. Ion exchange resins are regenerated by a series of steps, including backwashing, brining, and rinsing.

The District has attempted to blend water from a secondary water treatment plant with the June Lake water treatment plant to reduce the uranium content. Blending has worked for the short term; however, if the secondary plant is offline for any reason, the District would be forced to use only the June Lake plant with the uranium content in exceedance of the State standard. Using the proposed technology the proposed project will result in 521 annual acre feet of water supply that has been reliably treated.

Water Quality

The June Lake Public Utility District (“District” or “PUD”) is confronted with a water quality issue as it relates to the uranium content in June Lake, which is an approved surface water source for the District. Over the last three years, the District has seen uranium test results in exceedance of what the State allows, which is 20 pCi/L. Currently, uranium in the domestic water supply tests at about 24 pCi/L. District officials believe the more concentrated uranium is a result of reduced lake levels due to the ongoing drought conditions and decomposing natural materials within the lake. If the drought continues, uranium levels in June Lake would presumably continue to increase. The District has attempted to blend water from a secondary water treatment plant with the June Lake water treatment plant to reduce the uranium content. Blending has worked for the short term; however, if the secondary plant is offline for any reason, the District would be forced to use only the June Lake plant with the uranium content in exceedance of the State standard.

Without this project, the District would not be able use the June Lake water source due to the higher uranium concentrations exceeding 20 pCi/L. District management would also need to issue a Tier 2 public notice to all of its customers if domestic water was supplied at these higher levels. District available water rights for June Lake are approximately 170 million gallons per year. Being that this is one of two sources for June Lake Village, it becomes very concerning if this water is not available for domestic needs. District staff would obtain monthly grab samples of treated water to determine the physical benefits to this water source. Uranium levels would continue to be verified on a monthly basis to ensure they are less than 20 pCi/L and

preferably between 12 and 16 pCi/L. The District does not expect any negative impacts to physical benefits once the uranium treatment equipment is installed and put into service. The District is preparing for long-term drought needs by exploring groundwater through private well sources. District management is currently working with a hydrologist and geologist consultant to better define District needs for long-term groundwater sources for the June Lake village and down canyon service areas.

Direct Water-Related Benefit to a DAC

This project does not provide a direct benefit to a DAC.

Project Performance Monitoring Plan

The project will be implemented by employees of June Lake Public Utilities District. The project will consist of install an ion exchange unit to improve water supplies and water quality. A total time of 19 months will be required to complete this project. During the project, reports will be produced on a quarterly basis showing progress, deficiencies, expenditures, and any additional information required for grant administration. A final report will be produced at the end of the project to summarize results and cost. Additional performance monitoring information is provided below.

Table 6 – Project Performance Monitoring Plan		
Project: June Lake Public Utility District Uranium Removal Plant		
Proposed Physical Benefits	Targets	Measurement tools and methods
521 acre feet/year of reliably treated water supply	Water treatment, capable of producing “up to” 280,000 gallons per day	District staff will record daily treated production after ion exchange unit is brought online
Improved water quality/reduction of current uranium levels from 24 pCi/L to less than State MCL level of 20 pCi/L	Less than 20 pCi/L Uranium Content	Grab samples will be taken quarterly once the uranium ion exchange unit is installed and brought online to ensure MCL of 20 pCi/L is being achieved

Once the ion exchange unit has been installed and is completely functioning, the benefits of the project will include increased available (and more reliable) water supplies as well as improvements to water quality. Therefore, determining whether target treatment for water supplies and quality are being met is a robust indicator of whether the project is achieving desired outcome/proposed benefits.

Once the project has been completed, District staff will collect and record daily treatment production statistics, allowing for the determination of whether or not target treatment of up to 280,000 gpd is being realized. Alternatively, daily records will be compared to daily treatment objectives to determine if the ion exchange unit is performing adequately.

In addition to daily records for treated production, grab-samples of treated water will be collected following appropriate protocols and analyzed at least quarterly to ensure MCL of 20 pCi/L is being achieved as required for compliance purposes. Lab samples will be sent to either BC Laboratories in Bakersfield or the Mammoth Community Water District. Lab results will indicate whether treatment targets are being met and the treatment facility is meeting performance goals.

Cost Effectiveness Analysis

Table 7 – Cost Effective Analysis	
Project name: June Lake Public Utility District Uranium Removal Plant	
Question 1	<p>Types of benefits provided as shown in Table 5</p> <ul style="list-style-type: none"> -Reliably-treated water supply: 521 AF/year -Reduced Uranium Content: Current levels are 24 pCi/L, target level is less than 20 pCi/L
Question 2	<p>Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified? Yes</p> <p>If no, why? If yes, list the methods (including the proposed project) and estimated costs. Yes, the June Lake PUD has attempted to blend two water sources. Controlling the uranium levels in the blended water would require major water distribution upgrades including new CLA valves, vaults, and water line installations. Estimated costs would be \$325,000.</p>
Question 3	<p>If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods. This project is the least cost alternative. Currently the June Lake water source is the only water source that exhibits the high uranium levels, and District management is confident that introducing the uranium treatment pod to the existing treatment process would be less expensive and would not introduce uranium into the alternative source by blending water sources.</p>
Comments: n/a	

Project 4. Amargosa Basin Water, Ecosystem Sustainability, and Disadvantaged Community Project

Implementing Agency: Amargosa Conservancy

Project Description

Short: This project will provide essential information for long-term management of water resources for the severely disadvantaged community and surrounding environment of Tecopa.

Long: The Amargosa River Basin of Eastern California supports a unique and diverse ecosystem, a free-flowing river, and human needs – especially in the severely economically disadvantaged Tecopa area. Groundwater and surface water in the basin sustain one of the largest arrays of endemic and rare desert plant and animal species in the United States. In the disadvantaged community of Tecopa, groundwater and spring flow water resources supply municipal, domestic, agricultural, wildlife, stock-watering, mining, and other industrial uses. The recently designated (2009) Wild & Scenic flowing portion of the Amargosa River near Tecopa is a groundwater-fed surface water body, and relatively small variations in the groundwater surface elevation can have considerable effects on spring flow and surface flow in the river. Severe economic, social, and environmental impacts could occur as result of a relatively minor lowering of the groundwater surface in the area, as the local economy depends on the tourism generated by the Amargosa River, the area's warm and hot springs, and the water-fed ecosystems, and the local community increasingly depends on local groundwater resources for domestic and irrigation water. A comprehensive water management plan for the Tecopa area is essential to ensure sustainable use of these critical water resources. However, at present time there are very limited data to support the development of such a plan.

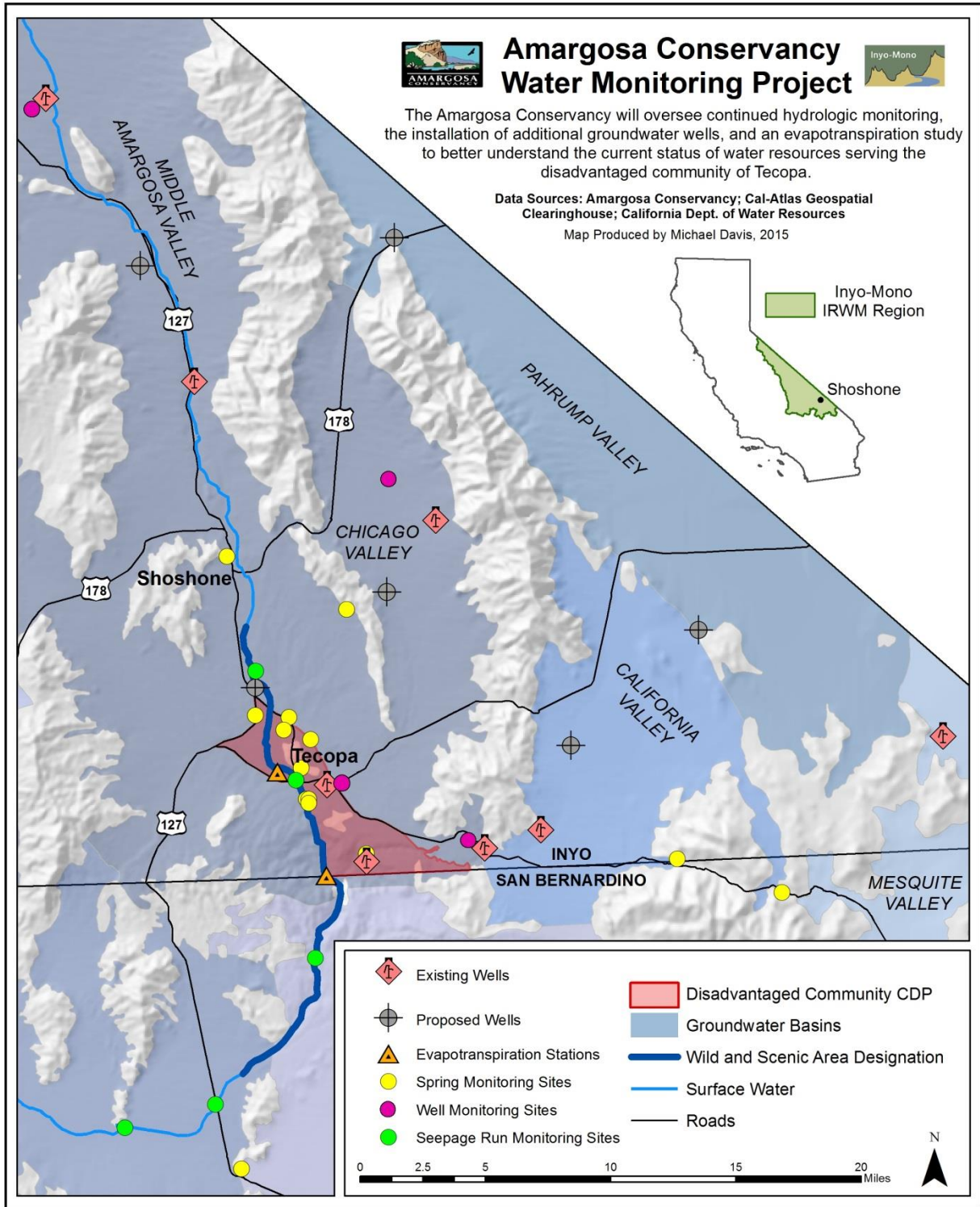
Given the importance of the issues described above, the following tasks will provide the greatest benefit in protecting that water supply by monitoring changes to the groundwater/ surface water system due to regional water resource pressures, such as groundwater pumping upstream in the basin, proposed industrial-scale solar developments, and increasing climate variability. This project will accomplish two goals: (1) developing an improved understanding of the region's hydrologic system in order to effectively and economically monitor and protect water resources for the benefit of the disadvantaged community, and the environment in general, by enhancing the limited monitoring currently conducted, and (2) establishing a long-term groundwater monitoring network. The work includes:

- Siting, permitting, installing and sampling up to six monitoring wells;
- Robust evaluation of evapotranspiration (ET) along the Amargosa River (essential to an understanding of the basin's groundwater budget and water availability);
- Continued groundwater level, spring flow and river flow monitoring for 12 months.

It is expected that the results of this project will lead to a comprehensive water management plan for the Tecopa area as well as one or more projects to secure the quality and quantity of water supply for the community. This project will also contribute to the development of the management plan for the stretch of the Amargosa River that has been designated as Wild & Scenic. This reach travels through Tecopa and could become an important source of ecotourism income if managed properly.

The Inyo-Mono IRWM Plan has identified supporting sustainable groundwater management as a regional objective. The Plan also has identified engaging and supporting the needs of DACs with respect to water resources as a regional water management objective. Given the paucity of data and necessary information having to do with groundwater in and around Tecopa for management purposes, and the fact that Tecopa is a severely DAC, the project addresses key identified needs within the region.

Project Map



Project Physical Benefits

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a presentation of quantifiable benefits is not required. However, a qualitative description of the proposed work and anticipated benefits of the project upon completion of a subsequent phase is included below.

The proposed work (monitoring well installation, hydrological monitoring, and evapotranspiration study) consists of expanding the existing hydrologic monitoring network for enhanced local water resource management planning, protection of water resources, increased understanding of the hydrologic system, and improved knowledge regarding the volume of water that moves through the system sustaining the springs that the Tecopa area is reliant upon.

Upon completion of the project inclusive of monitoring well construction, the project will:

- Be incorporated into, and provide critical information for, the Amargosa Wild & Scenic River Management Plan (in progress – the plan incorporates sustaining springs that feed the river and are critical to the disadvantaged Tecopa area);
- Provide enhanced monitoring to protect the water resource being used to provide potable water to the Tecopa area (a feasibility study was conducted under prior DWR grant);
- Provide a greater understanding of the groundwater available in the area and an increased planning confidence with respect to new development (both from renewable energy development and future regional population growth); and
- Provide the basis for a future groundwater management plan should one be developed.

Technical Justification of Physical Benefits Claimed

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, only an explanation of why the proposed project is needed is provided below addressing Item 1 within the section of the PSP.

The DAC-Tecopa is entirely dependent on springs and associated groundwater to maintain the economic lifeblood of the community. Numerous endangered and other sensitive species such as the Southwestern Willow Flycatcher, Least Bell's Vireo, Desert Pupfish and the critically endangered Amargosa Vole are dependent on shallow groundwater and the plants sustained by that groundwater. Recent studies have documented substantial declines in several area springs with decreases in flow of as much as 90% during the last 80 years. It is believed that these declines were likely the result of regional groundwater pumping. Given the effects of the ongoing drought on historically seasonal springs, and regional (including out of state) stresses from pumping on the larger springs associated with the regional flow system (for example at Tecopa Hot Springs), the proposed work is essential for strategically managing the existing water resources in the area. Groundwater in this portion of the Amargosa Basin all flows toward Tecopa and is critical for sustaining the fragile ecology of the springs in and around Tecopa and the fragile economy of the area.

This project will provide direct water-related benefits to a project area entirely comprised of a DAC, and despite the inclusion of monitoring well construction, is in the planning/development stage and not intending to complete construction with this solicitation. After the proposed work is completed, a final round of monitoring well construction and long-term monitoring may be proposed pending the results of this work. Those recommendations would be included within the final report for this project. This portion of California has not seen the level of water resource management investment that other regions in the state have had available, and is essentially catching up in needed monitoring and associated infrastructure to inform water resource management.

Direct Water-Related Benefit to a DAC

Although portions of the project lie outside the immediate area of the disadvantaged Tecopa area, as described above, the disadvantaged community of Tecopa is a key down-gradient receptor of declines in groundwater movement and decreased spring flow in the full area to be included within the monitoring well construction, monitoring, and hydrologic investigations. Therefore, direct water-related benefits resulting from this project, and potential projects subsequent to this project, will benefit an area entirely comprised of a DAC.

The existing monitoring network is only minimally protective of identifying changes to the groundwater system before those changes would become irreversible and potentially severely impact the economy of the already disadvantaged community along with the endangered and other sensitive species present that rely on the shallow groundwater and associated groundwater-dependent surface flow of springs and the Amargosa River. A more robust monitoring network has not been developed due to a lack of funding for the area.

As described earlier, upon completion of the project, direct benefits to the disadvantaged community of Tecopa will include:

- Critical information for the Amargosa Wild & Scenic River Management Plan (in progress – the plan incorporates sustaining springs that feed the river and are critical to the disadvantaged Tecopa area);
- Providing enhanced monitoring to protect the water resource being used to provide potable water to the Tecopa area (a feasibility study was conducted under prior Prop. 84 Implementation grant);
- A greater understanding of the groundwater available in the area and increased planning confidence with respect to new development (both from renewable energy development and future regional population growth).

Project Performance Monitoring Plan

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a Project Performance Monitoring Plan is not required per the PSP.

Cost Effectiveness Analysis

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a Cost Effectiveness Analysis is not required per the PSP.

Project 5. Big Pine Tribal Fire Hydrant Replacement Project

Implementing Agency: Big Pine Paiute Tribe of the Owens Valley

Project Description

Short: This project will replace 38 obsolete, non-functional fire hydrants, protecting structures, tribal members, and the environment from fire threat throughout the Big Pine Indian Reservation.

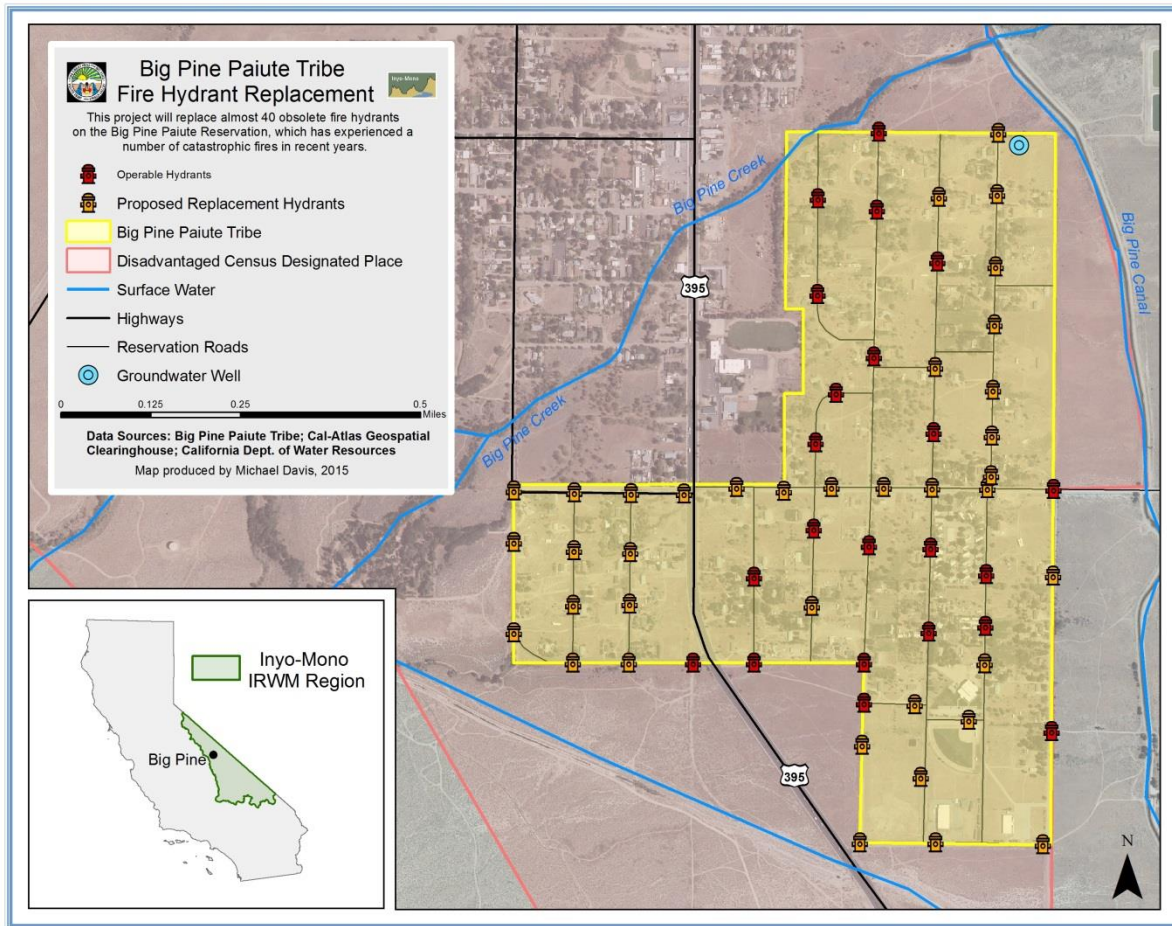
Long: The Big Pine Paiute Tribe of the Owens Valley (Tribe) is a federally recognized tribe located on the Big Pine Indian Reservation in Inyo County. The Tribe is considered a disadvantaged community with an annual median household income (MHI) of \$36,477, significantly less than 80 percent of the Statewide MHI. The Big Pine Indian Reservation has a population of 500 people of which 400 are tribal members. The Big Pine Indian Reservation exists along a wildland-urban interface on the eastern slopes of the Sierra Nevada Mountains. Isolated residential fires have caused extensive destruction of homes over the past decade on the Big Pine Indian Reservation, and the potential for wild fire is a great risk to the community. In 2012, the Big Pine FireSafe Council was formed to protect the homes, communities, and environments from wildfire in the Big Pine area. The Tribe is a partner in the Council and through this proposal is working to protect the Big Pine area by replacing fire hydrants on the Reservation.

The Tribe has experienced eight catastrophic household fires (one as recently as June 2015) in the past ten years that could have posed less of a danger to the rest of the community if fire hydrants were able to function at their peak performance. Reasons for the catastrophic nature of these household fires have been noted as due to a lack of working fire hydrants within the proximity of the homes (Big Pine Volunteer Fire Department Chief personal communication). The Tribe operates an independent public water system that is in need of fire protection infrastructure upgrades for improved access to water at fire hydrants to assist the local volunteer fire department and other fire agencies in extinguishing fires within the tribal community.

This project will replace 38 hydrants on the Tribe's public water system that have reached the end of their useful lives, or for which hydrant parts are no longer available for purchase. The Big Pine Tribal Fire Hydrant Replacement Project shall replace obsolete fire hydrants throughout the distribution system to increase the safety of the residents, prevent property and infrastructure damage, reduce habitat degradation, prevent a wildfire from spreading to other areas, and reduce the likelihood of sedimentation and water quality impacts on Big Pine Creek.

Maintaining and enhancing water, wastewater, emergency response, and power generation infrastructure efficiency and reliability is a management objective included in the Inyo-Mono IRWM Plan. This project will specifically address the need for improving emergency response infrastructure and reliability through replacement of antiquated fire hydrants that are unreliable and pose threats to infrastructure, property, human health and safety, and the surrounding environment of Big Pine. Therefore, this project addresses a regional need.

Project Map



Project Physical Benefits

By improving emergency response in the project area, this project has the potential to reduce losses from fire. Improved fire-fighting infrastructure can only reduce the risk of fires spreading beyond the initial ignition. Because of many factors beyond the influence of this project, direct benefits cannot be readily forecast. For example, over any given time period, there could be a complete absence of fires. At the other extreme, the community could face a fire situation so difficult that any fire-fighting efforts are overwhelmed. Therefore, we have used a simple accounting procedure that has been commonly used by local governments to evaluate investments in infrastructure and personnel for emergency response. This accounting scheme uses historical loss data and an assumed rate of reduction resulting from the implementation of the project.

Table 5 – Annual Project Physical Benefits			
Project Name: Big Pine Tribal Fire Hydrant Replacement Project			
Type of Benefit Claimed: Avoided Loss - Primary			
Units of the Benefit Claimed: Number of Homes Destroyed by Fire			
Anticipated Useful Life of Project: 40 years			
(a)	(b)	(c)	(d)
Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project (c) - (b)
2015	0.8	0.2	-0.6
2016	0.8	0.2	-0.6
2017	0.8	0.2	-0.6
2018	0.8	0.2	-0.6
Etc. through Last Year of Project Life	0.8	0.2	-0.6
Total Avoided Loss	32	8	-24

Comments: 1 home = an estimated worth of \$208,602 (<http://www.city-data.com/city/Big-Pine-California.html#ixzz2A9WpxvaK>); (b) 32 homes lost = \$6.6 million; (c) 8 homes lost = \$1.6 million; (d) Avoided cost = 24 homes and \$5 million

Table 5 – Annual Project Physical Benefits			
Project Name: Big Pine Tribal Fire Hydrant Replacement Project			
Type of Benefit Claimed: Avoided Loss - Secondary			
Units of the Benefit Claimed: Area of Land Burned (acres)			
Anticipated Useful Life of Project: 40 years			
(a)	(b)	(c)	(d)
Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project (c) - (b)
2015	0.4	0.1	-0.3
2016	0.4	0.1	-0.3
2017	0.4	0.1	-0.3
2018	0.4	0.1	-0.3
Etc. through Last Year of Project Life	.4	.1	-0.3
Total Avoided Loss	16	4	-12

Comments: Over the past decade, 8 lots averaging 0.5 ac each have burned

Technical Analysis of Physical Benefits Claimed

The primary physical benefit of the project is the avoided cost of property and infrastructure damage and loss associated with fire-related impacts on the Reservation. The loss of eight homes on the Reservation over the last decade due to fire has placed a tremendous financial and social burden on the community. The estimated median house or condo value for Big Pine in 2012 was \$208,602 (<http://www.city-data.com/city/Big-Pine-California.html#ixzz2A9WpxvaK>). Therefore, the destruction of eight homes to fire on the Reservation over the last 10 years has resulted in a financial loss of over \$1.6 million.

This project will provide additional firefighting capability to reduce fire-related impacts on the Reservation. It is estimated that the project will decrease the risk of a catastrophic residential fire by 75%. When factoring the value of a house at \$208,602 coupled with a fire hydrant’s life expectancy of 40 years, the avoided cost benefit for this project is \$5 million, and 24 homes would be saved. If this project was not implemented and the amount of homes destroyed by fire continues to average 0.8 structures a year, then an estimated 32 homes will be consumed by fire on the Reservation over the next 40 years resulting in costs of \$ 6.6 million.

The secondary physical benefit of this project is a potential reduction in land burned and consequent avoided degradation of physical habitat. Over the past decade, each of the eight homes that burned on the Reservation occupied a lot averaging about 0.5 ac. Although not all of each lot was burned, some fires burnt portions of adjacent properties. Therefore, it is estimated that about four acres burned in the past decade, with a crude average of 0.4 ac per year. We have used the same 75% loss-reduction estimate that the project will decrease the amount of land burned by 16 acres. The rural nature of the Reservation provides significant habitat for many species of wildlife and native plants. The project could also contain residential fires before they spread on to nearby wild lands.

There are no potential adverse physical effects as a result of this project. This project will replace fire hydrants in locations that have previously been impacted by the construction of the water distribution system. In addition, the fire hydrants are located in the right of way for roadways on the Reservation that require regular maintenance.

The long-term impacts associated with drought will continue to increase the risk of wildfire on the Reservation, and this project will provide a means for extinguishing fires in a more timely and efficient manner.

Project Performance Monitoring Plan

The project will be implemented by a two-member force account team with oversight by the Tribal Utility Operator and Tribal Administrator. The project will consist of removing the old fire hydrants and associated material and installing new fire hydrants. A total time of 22 months will be required to complete this project. During the project, reports will be given on a quarterly basis showing progress, deficiencies, expenditures, and any additional information required for grant administration. A final report will be produced at the end of the project to summarize results and cost.

Table 6 – Project Performance Monitoring Plan		
Project: Big Pine Tribal Fire Hydrant Replacement Project		
Proposed Physical Benefits	Targets	Measurement tools and methods
Decrease in residential structure loss	75% reduction in residential structure loss as compared to last 10 years	Data on residential structure loss from fire; data from the decade before and after project construction will be compared.
Decrease in land area burned	75 % reduction in land area burned as compared to last 10 years	Data on land area burned; data from the decade before and after project construction will be compared.

The fire hydrants installed as a part of this project will be tested, and verification will be made that they operate as intended prior to project completion. In addition, an annual hydrant flushing program will be initiated after the completion of the project to ensure that hydrants are kept in good working order for optimal life expectancy.

Residential Fire Structure Loss Data will be evaluated following a ten-year period to determine the cost/benefit ratio of this project for the Tribe. The evaluation will compare loss of residential structures due to fire from 2005-2015 and 2016-2026 in order to show the beneficial impact the project has made to the Tribe.

The secondary benefit will be assessed through the annual inventory of fires with estimates of the area of land burned each year from 2016-2026.

Cost Effectiveness Analysis

Table 7 – Cost Effective Analysis	
Project name: Big Pine Tribal Fire Hydrant Replacement Project	
Question 1	Types of benefits provided as shown in Table 5 - Avoided Property Loss and Avoided Acreage Burned
Question 2	Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified? No alternative methods for achieving the same goals have been identified If no, why? If yes, list the methods (including the proposed project) and estimated costs. This project is replacing antiquated components within an existing water system infrastructure for improved fire protection. The only other alternative to this project would be replacing the current water infrastructure, which would not be cost effective.
Question 3	If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods. There are no known cost effective alternatives to replacing fire hydrants throughout the Reservation for improved fire protection. Fire hydrants are relatively inexpensive to install and maintain. The proposed project is the least cost alternative.
Comments:	

Project 6. Ridgecrest Cash-for-Grass Landscape Rebate Incentive Program

Implementing Agency: Indian Wells Valley Water District

Project Description

Short: This project will implement a turf removal program for residential, multi-family, commercial, industrial, and institutional water users to conserve water in the Indian Wells Valley.

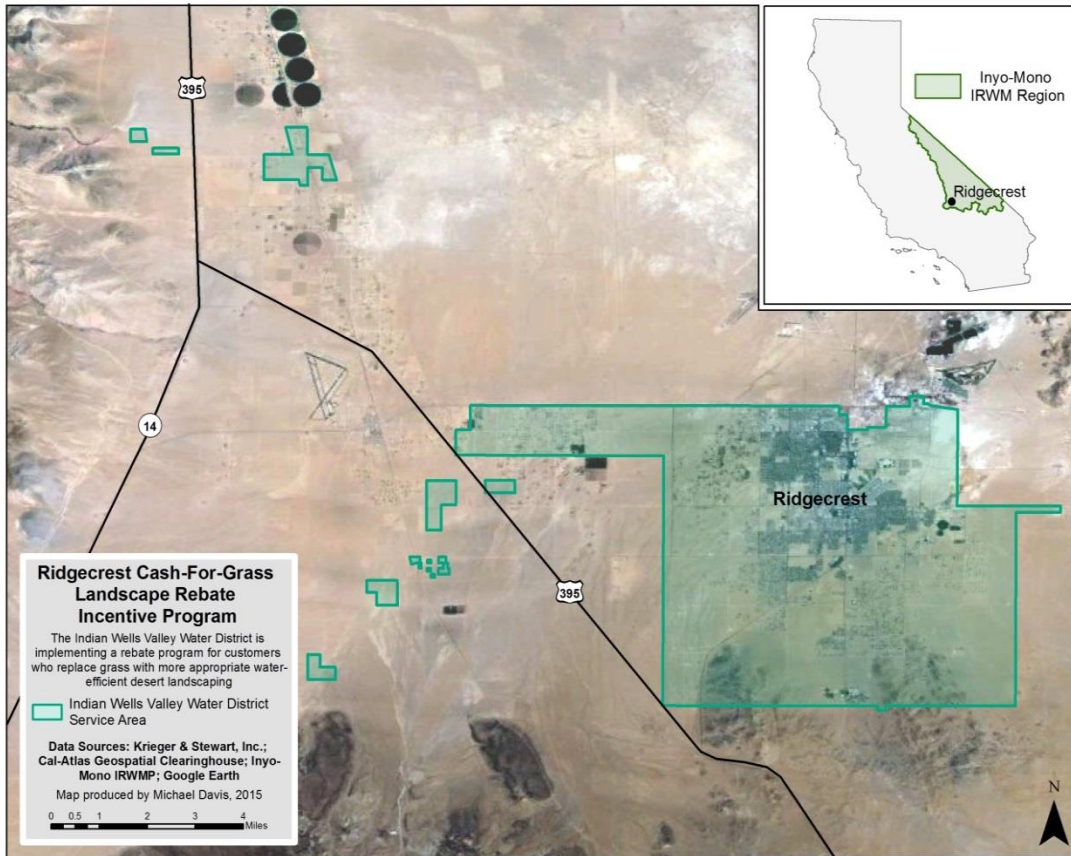
Long: Only one source of potable water exists in the Indian Wells Valley (IWV) of California – an aquifer. Multiple users draw upon this aquifer, including Indian Wells Valley Water District (IWWVD, serving Ridgecrest), China Lake Naval Air Weapons Station, Searles Valley Minerals, Inyokern Community Services District, and private residential and agricultural well owners. Combined usage is about 30,000 acre feet per year, and IWWVD customers are responsible for about 29 percent of that total. However, replenishment off the eastern face of the southern Sierra Nevada has been shown to be only about 9,000 acre feet per year. Water levels are exhibiting a downward trend through time without recovery even as California’s “20 x 2020” is demanding a per capita water use reduction of 20 percent by the year 2020. Therefore, real headway in water efficiency and water conservation is imperative.

The Indian Wells Valley Water District is implementing a cash-for-grass landscape rebate incentive program. It is believed that such a program will achieve measurable results within a reasonable time period. According to a five-year, multi-million-dollar study conducted by the Southern Nevada Water Authority, grass in a similar desert environment to Ridgecrest requires 73 gallons of water per square foot per year to thrive while xeriscape only needs 17 gallons per square foot – a significant savings. By converting a mere 1,000 square feet of grass to xeriscape, a single homeowner could save the Valley one acre foot of water in less than six years, and if all customers followed suit, the District could save nearly 650 million gallons of water in just one year. A program of this nature requires adequate financial incentive to produce enough living turf conversion to substantially reduce water usage in the Indian Wells Valley. An attractive buy-back price per square foot of turf is \$1.00.

This Project is a rebate incentive program to promote living turf removal at residential, multi-family, commercial, industrial, and institutional properties located within the boundaries of the Indian Wells Valley Water District service area to conserve water in the Indian Wells Valley groundwater basin.

Protecting and *conserving* water supplies to communities throughout the Inyo-Mono IRWM Region is an identified objective within the Inyo-Mono IRWM Plan. This project will result in conserved water (water supply) and in doing so, help protect water supplies for the community of Ridgecrest. As such, this project is addressing an identified regional need.

Project Map



Project Physical Benefits

Table 5 – Annual Project Physical Benefits			
Project Name: Ridgecrest Cash-for-Grass Landscape Rebate Incentive Program			
Type of Benefit Claimed: Water Savings -Primary			
Units of the Benefit Claimed : Acre-Feet			
(a)	(b)	(c)	(d)
Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project (b) - (c)
2015	0	16.4	16.4
2016	0	32.8	32.8
2017	0	49.2	49.2
2018	0	65.6	65.6
2019	0	65.6	65.6
2020	0	65.6	65.6
2021	0	65.6	65.6

2022	0	65.6	65.6
2023	0	65.6	65.6
2024	0	65.6	65.6
2025	0	49.2	49.2
2026	0	32.8	32.8
2027 (Last Year of Project Life)	0	16.4	16.4
Total Savings	0	656.5	656.5

Comments: Program applicants must commit to maintaining a xeriscape landscape for 10 years. Based on current implementation schedules per the current budget of \$60,000 plus \$322,000 grant funding, the District assumes it will issue rebates for 95,500 square feet removed in Year One; 95,500 square feet removed in Year Two; 95,500 square feet removed in Year Three and 95,500 square feet removed in Year Four. At 56 gallons of water savings per year, 95,500 square feet removed will yield an annual water savings of 16.4 acre-feet. Thus, the cumulative savings over the 13-year project life is 656.5 acre-feet.

Table 5 - Annual Project Physical Benefits			
Project Name: Ridgecrest Cash-for-Grass Landscape Rebate Incentive Program			
Type of Benefit Claimed: Avoided Energy Use			
Units of the Benefit Claimed : kW-hours			
Additional Information about this Benefit: Once yards are converted, savings occur from reduced pumping. Savings are ongoing through 13-year project life.			
(a)	(b)	(c)	(d)
Physical Benefits			
Year	Without Project	With Project	Change Resulting from Project (b) - (c)
2015	0	12,066	12,066
2016	0	24,151	24,151
2017	0	36,227	36,227
2018	0	48,303	48,303
2019	0	48,303	48,303
2020	0	48,303	48,303
2021	0	48,303	48,303
2022	0	48,303	48,303
2023	0	48,303	48,303
2024	0	48,303	48,303
2025	0	36,227	36,227
2026	0	24,151	24,151
2027 (Last Year of Project Life)	0	12,066	12,066
Total Savings	0	483,009	483,009

Comments: Calculations are based on the projected water savings in acre-feet in Table 5 for water savings and assuming a typical District well pumping unit equipped with a 200 HP motor pumping at a rate of 1,100 gpm.

Although difficult to quantify, another benefit of a turf removal program is a reduction of greenhouse gas emissions. Although living turf does remove CO₂ from the air and store carbon in the soil, it does require maintenance: applying fertilizer, mowing, irrigation, leaf blowing, etc., all of which produce emissions at up to four times greater than the amount of carbon stored. One study indicates eight percent of greenhouse gas emissions in the United States are from lawn maintenance.

Technical Analysis of Physical Benefits Claimed

With California facing a fourth consecutive year of drought conditions and a minuscule 5% of normal snowpack in the Sierra at the traditional April 1st measurement, the State Water Resources Control Board (SWRCB) adopted mandatory restrictions at the Board's May 5th meeting intended to result in a statewide 25% reduction in urban potable water use as directed by Governor Jerry Brown. The restrictions, developed over a period of weeks, established four tiers of conservation for municipal water providers based on residential gallons per capita per day (R-GPCD) usage during September 2013. More than 250 comments were received following the initial draft released April 7th. The SWRCB considered many of the suggestions and comments and re-issued the draft regulations April 17th using reported R-GPCD data for the months of June, July and August 2013 and increasing the number of conservation tiers from four to nine. Another 300 comments were received. In the final regulations adopted by the State Board, IWWWD placed in the ninth tier with a 36% conservation target, based on R-GPCD of 240.8. The SWRCB will be monitoring IWWWD water usage from June through March and comparing it to the same period of time in 2013, the year being used as the baseline. In anticipation and response of this requirement, the Board of Directors of IWWWD adopted Ordinance 97, Emergency Water Conservation Regulation, at their April 13th meeting to implement the mandatory actions enacted by the State Board. Many of these actions are carryovers from the restrictions implemented last year. However the most significant new action is the implementation of a three day per week watering schedule. With outdoor landscaping estimated at anywhere from 50% to 65% of residential water use, the opportunity to achieve the largest savings and attain the established conservation standard of 36% is reducing outdoor watering. In addition to implementing restrictions on landscape irrigation, reducing the amount of living turf requiring irrigation can result in a significant contribution to an overall reduction in water use.

IWWWD has reviewed several Cash for Grass programs that have been implemented in California and Nevada that confirm significant water savings will be achieved. IWWWD has designed its Cash for Grass Landscape Rebate Incentive Program based on existing programs. Water savings estimates for the proposed program are based on projections and savings experienced in similar programs throughout the West. The technical feasibility of living turf replacement programs has long been documented and is a key element to the "New Normal in California landscapes," which promotes an integrated approach to landscaping, defined and promoted by DWR and the California Urban Water Conservation Council.

The 2005 Southern Nevada Water Authority's (SNWA) Xeriscape Conversion Study shows an average water savings of 55.8 gal/ft² by converting grass to a water smart landscape (http://www.snwa.com/assets/pdf/about_reports_xeriscape.pdf). According to the IWWWD 2011 Urban Water Management Plan, the average evapotranspiration (ET) and rainfall in the Indian Wells Valley is 66 and less than 5 inches per year, respectively, which is similar to the conditions in the SNWA service area at the time of the 2005 SNWA Study. The Project water savings is therefore calculated with a standard coefficient of 56 gal/ft² of turf replaced.

Total funding for the IWWWD Cash for Grass Landscape Rebate Incentive Program, including the funds requested in this proposal, will provide for removal of 382,000 ft² of living turf. Using the standard coefficient of 56 gal/ft², a total water annual savings of 66 acre-feet can ultimately be realized with full implementation of the program. The savings can be expected to increase as others see the landscaping examples supported by

this program, recognize the advantages of converting turf to more desert appropriate landscaping, and initiate conversion on their own.

Using the stated water savings from the Table 5 above, there will be an energy savings realized as a result of less hours of pump run time. A typical IWVWD well pumping unit is equipped with a 200 HP motor. Based on the hours required for the motor to run and pump the volume of water, a calculation can be made to estimate the kW-hrs of energy saved. In the case of this proposed project, the range in savings of kW-hrs is from 12,066 in year one to 48,303 in year five and beyond. Combined, it is expected that 483,009 kW-hrs will be saved. An added benefit from the kW-hours savings is a CO2 reduction. Using the EPA’s CO2 calculator at <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>, the kW-hours savings also reduces Carbon Dioxide Equivalent of 333 metric tons.

Direct Water Benefit to a DAC

The project area in which this project is to be implemented does not include a Disadvantaged Community (DAC).

Project Performance Monitoring Plan

The project will be implemented by employees of the Indian Wells Valley Water District. The project will consist of implementing a cash-for-grass rebate program. A total time of 48 months will be required to complete this project. During the project, reports will be given on a quarterly basis showing progress, deficiencies, expenditures and any additional information required for grant administration. A final report will be produced at the end of the project to summarize results and cost. Additional performance monitoring information is provided below.

Table 6 - Project Performance Monitoring Plan		
Project: Ridgecrest Cash-for-Grass Landscape Rebate Incentive Program		
Proposed Physical Benefits	Targets	Measurement tools and methods
Water Savings	Average annual reduction over 13 years of 53 acre feet	Individual accounts are metered, and meters are read monthly. It will be very simple to monitor the meters where the program was implemented to verify the savings.
Avoided Electrical Use	Annual average reduction in energy use of 48,303 kW-hours once the program is fully implemented	Based on the actual water savings by program participants, the District can calculate the kW-hours saved using the following calculation: (gallons saved / pumping rate per minute / 60 to convert to hours /149,140 wattage of 200 HP motor)

IWVWD meters individual services and will be able to monitor water usage where the Cash-for-Grass Rebate Incentive Program has been implemented in order to verify the projected savings have been achieved. Therefore, for performance monitoring purposes, monthly water meters of participating entities will be reviewed and compared against water-use records prior to project implementation. It is possible, however, that other variables can impact water usage at these properties as demand may not necessarily remain constant in subsequent years. For example, the number of residents may increase or decrease, new water saving appliances/devices may be installed, or new water uses such as an additional evaporative cooler, swimming pool or fountain may be added. Also, there may be a leak that goes undetected for a period of time offsetting the expected savings. To address extraneous factors that may influence water demand, once a year

a subset of 10 participants will be contacted and asked to complete a brief questionnaire to collect information such as demographics, changes in appliance, etc. allowing for an estimation of the relative changes in water-use resulting from the rebate program versus other actions.

The projected energy savings from reduced run time of a motor at a typical pumping unit within the District will be difficult to verify due to the complexity of the system and the many variables involved. However, verification of the water savings translates into energy savings since water not pumped requires no energy use.

Cost Effectiveness Analysis

Table 7 – Cost Effective Analysis	
Project name: Ridgecrest Cash-for-Grass Landscape Rebate Incentive Program	
Question 1	Types of benefits provided as shown in Table 5: Water Savings and Avoided Energy Use
Question 2	<p>Have alternative methods been considered to achieve the same types and amounts of physical benefits as the proposed project been identified? No.</p> <p>If no, why? Outdoor landscape irrigation accounts for 50% to 65% of domestic water use, so based on the effectiveness of turf removal rebate programs utilized by agencies including but not limited to Southern Nevada Water District (SNWA) and by Mojave Water Agency (MWA), this is the fastest and most effective way for customers to conserve water with the least cost to the District. This program will also help the District attain the 36% conservation target assigned by the State Water Board with the least impact on safety or health. IWVWD has already implemented other water conservation measures including distribution of free water saving devices such as low flow showerheads, faucet aerators, hose nozzles, moisture meters, and dye tablets to detect leaks in toilets. Although each of these devices reduce water use, none achieve the savings at the same level as turf removal. IWVWD also utilizes a network of volunteer XERIC® Ambassadors to provide individual consultations with residents desiring to landscape with desert-appropriate plants and materials. IWVWD has adopted Ordinance 97, Emergency Water Conservation Regulation, which includes mandatory reduction of landscape irrigation to three days per week. Fixture and appliance rebate programs have been considered, but they require more program management and direct costs than a Cash-for-Grass program. With no other options to incentivize water-use reductions, this project is considered the most effective method of achieving a reduction of water-use as proposed.</p> <p>If yes, list the methods (including the proposed project) and estimated costs.</p>
Question 3	<p>If the proposed project is not the least cost alternative, why is it the preferred alternative? Provide an explanation of any accomplishments of the proposed project that are different from the alternative project or methods. For the amount of potential water savings, a turf removal program as is being proposed with the Cash-for-Grass-Rebate Incentive Programs is one of the most cost effective methods to achieve a significant reduction in water use. The maximum rebate offered by IWVWD will only partially cover the total cost of landscape conversion to xeriscape. Homeowners take on the remaining expense. Furthermore, as reported by SWNA and MWA, landscape conversion tends to be a long-lasting change via a bandwagon effect. It is expected the properties that utilize the program will provide examples to inspire others to convert their landscape using desert appropriate plants and materials and reduce maintenance while achieving a significant water savings.</p>
Comments: None.	

Project 7. Recycled Water for Restoration and Community Projects in Big Pine

Implementing Agency: Inyo County

Project Description

Short: This project will conduct a feasibility study and an improvement plan for the development of wastewater reclamation facilities in Big Pine, which is a DAC.

Long: The County of Inyo proposes completing Phase I of a project to establish a wastewater reclamation facility in the town of Big Pine. Phase I will consist of a planning study (comprised of a feasibility study and improvement plan) to produce and distribute non-potable recycled water. Upon completion, it is anticipated Phase II will be implemented, thereby constructing a reclamation facility for recycled water to be produced in conformance with California's Water Recycling Criteria. Phase II would provide water for landscaping, agriculture, and environmental restoration in the Big Pine area that would otherwise be supplied with an already-limited potable water supply that serves two disadvantaged communities.

With the current drought and water shortages facing California, and local water availability strained by year-after-year low runoff, water recycling needs to be part of the mix of the communities' water supply. This would be the first of its kind water recycling project in Inyo County and would serve to demonstrate the potential for similar systems. This carefully designed and executed system would serve as a blueprint for similar projects that could be built in the Inyo-Mono IRWM planning area.

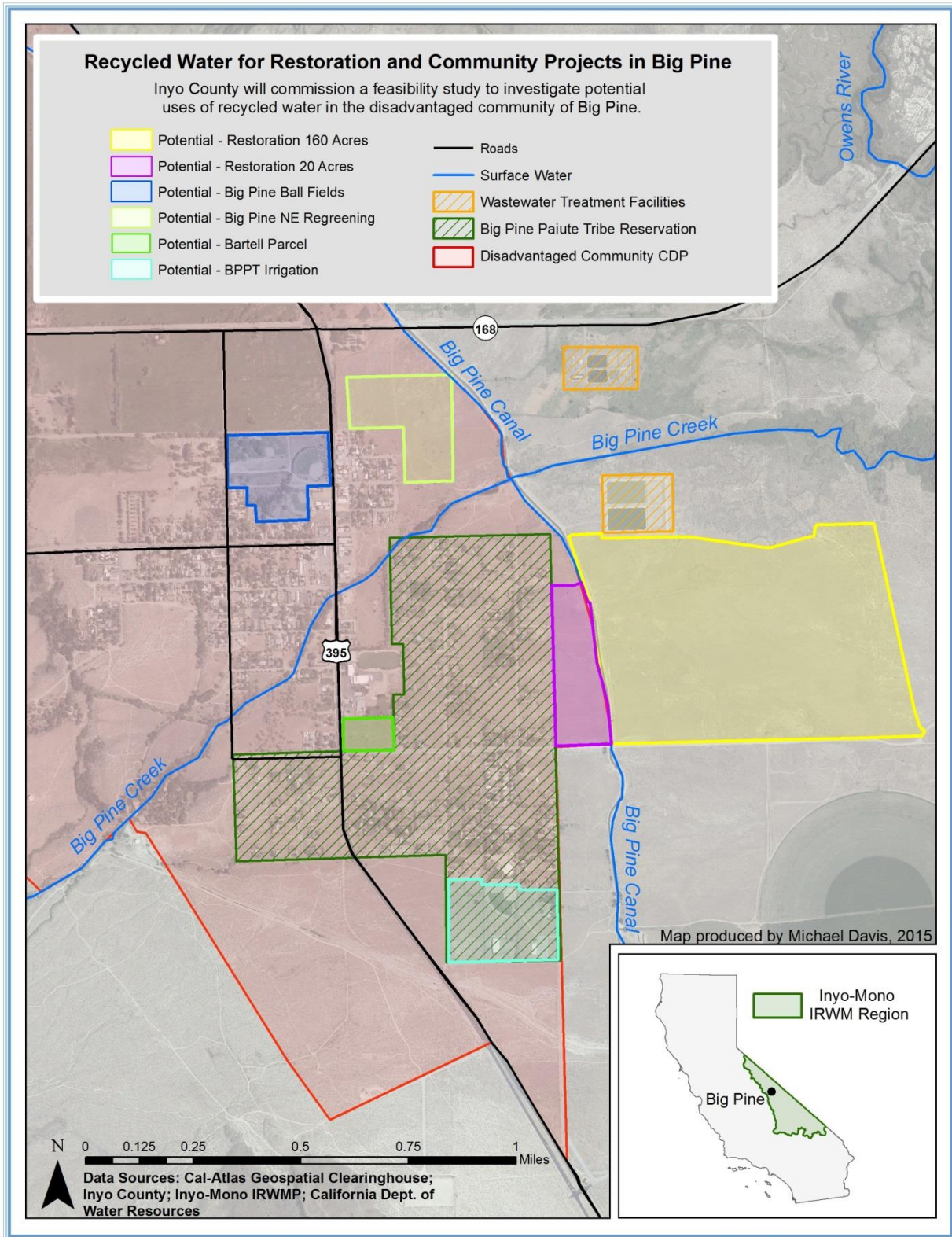
The feasibility study will evaluate using effluent from the Big Pine Community Services District (BPCSD) and Big Pine Paiute Tribe (BBPT) wastewater treatment plants to serve irrigation needs at a number of locations within the community of Big Pine and on the Reservation. The BPCSD serves approximately 340 residences and 20 commercial properties. Their 150,000 gallons/day wastewater facility provides primary treatment at an average flow of 90,000 gallons/day (100 acre-foot/year). The plant currently has an aeration channel, two oxidation ponds, and four percolation ponds. Nearby (0.21 miles), the BPPT wastewater facility treats 20,000 gallons/day (22.4 acre-foot/year). The BPPT system serves 462 members.

The feasibility Study will investigate potential uses for recycled water in Big Pine. The scope of work will be developed by a planning committee composed of Council representatives and environmental staff from the Big Pine Paiute Tribe, representatives from the Los Angeles Department of Water and Power, Big Pine Community Service District Board members, Inyo County Supervisors, and Inyo staff from the Water Department, Public Works, and Environmental Health offices.

The feasibility Study will look at the potential for supplying these alternative uses. The study will consider the quantity and quality of effluent available, reuse regulations, public health, and the level of treatment required. The feasibility study will present draft alternatives that will be the subject of an environmental review. The planning committee and the public will review the projects, and the project or projects chosen to move forward will be the subject of an improvement plan developed by the consultant. The improvement plan will include engineering design and will take the project through permitting. At the end of the *Recycled Water for Restoration and Community Projects* project there will be up to three shovel-ready recycled water projects in the Big Pine area. Construction and operations and maintenance funding for the chosen projects will be obtained by the recycled water recipient.

Addressing the needs of DACs throughout the Inyo-Mono planning region is an identified objective within the Inyo-Mono IRWM Plan. Moreover, managing limited water resources to ensure adequate supplies, especially during drought periods is critical to regional self-reliance and the sustainability of water resources in the region. Completion of this project will benefit a DAC and a tribe, increase water use efficiency and sustainable management of water resources, while also increasing regional self-reliance with respect to water management. Therefore, this project addresses a regional need.

Project Map



Project Physical Benefits

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a presentation of quantifiable benefits is not required. However, a qualitative description of the proposed construction work and anticipated benefits of the project upon completion of construction is included below.

Water supplies

The *Recycled Water for Restoration and Community Projects* proposes to recycle up to 100% of the community's wastewater. Currently, pumped groundwater supplies all of the town's potable water supply. The feasibility study will evaluate using effluent from the Big Pine Community Services District (BPCSD) and BBPT wastewater treatment plants to satisfy irrigation needs at a number of locations within the community of Big Pine and on the Reservation. The BPCSD serves approximately 340 residences and 20 commercial properties. A 150,000 gallons/day wastewater facility provides primary treatment at an average flow of 90,000 gallons/day (100 acre-foot/year). The plant currently has an aeration channel, two oxidation ponds, and four percolation ponds. Nearby (0.21 miles), the BPPT wastewater facility treats 20,000 gallons/day (22.4 acre-foot/year). Combined, and as an anticipated benefit of future construction, the BPCSD and the BPPT has the potential to supply up to 122.4 acre-feet of recycled water per year.

Improved habitat

The primary use of recycled water may be to provide irrigation to support planting native vegetation on 180 acres of barren land that is now a source of particulate pollution affecting the community. Approximately 41 to 45 acre-feet of water per year would be required to provide drip irrigation to the plantings covering an area of 180 acres. As noted above, it is anticipated that the outcome of this project will provide the bases for a recycled water facility to be constructed that will provide up to 122 acre-feet of water per year. Based on estimates of how much water is required to irrigate lands and how much is likely to be produced via water recycling, a benefit of restoring at least 180 acres of habitat with native vegetation is expected.

Technical Analysis of Physical Benefits Claimed

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, only an explanation of why the proposed project is needed is provided below addressing Item 1 within the section of the PSP.

The past three years have been extremely dry, both in terms of precipitation on the Owens Valley floor and in terms of winter snow accumulation in the mountains. Runoff in Owens Valley during 2012, 2013, and 2014 has been 57%, 54%, and 52% of normal, respectively, according to Los Angeles Department of Water and Power's (LADWP) stream flow measurements. This is the lowest runoff for three consecutive years in the record starting in 1935. These conditions have resulted in extremely low stream flows, reduced groundwater recharge, and diminished water availability.

Snow accumulation in the Sierra Nevada is far below normal this year, and warm temperatures have caused the snow pack to dissipate unusually early. LADWP's LA Aqueduct web site (ladwp.com) shows that the snow pack at four of five snow measurement sites in the Owens Valley watershed was less than 10% of normal; two sites had no snow.

Although it is possible that the recent episodes of drought are anomalies, there is mounting evidence that extended periods of reduced precipitation will occur more frequently in California and the west due to global climate change.

In the Owens Valley, a diminished water supply is already having a negative effect on domestic and agricultural water users. Private wells are drying up, and landscape and trees are being lost. Water for ranchers is being restricted, and in addition to economic losses, the lack of agricultural water is resulting in loss of habitat; trees and other vegetation dependent on irrigation are dying. Recycled wastewater can be

used directly to support irrigation, or it can be applied to offset the use of potable water for landscape and environmental mitigation.

Replacing pumped groundwater with recycled water is an important goal of this project. LADWP's groundwater pumping in the Big Pine Wellfield (BPW) since 1974 has been relatively large compared with other wellfields. Minimum pumping to supply uses in the BPW include a local hatchery (Fish Springs Hatchery-approximately 19,500 ac-ft) and Big Pine town supply (500 ac-ft). Pumping under the legally binding Water Agreement between Inyo County and LADP largely has been to supply these uses. In 2009, 2010, 2011, 2012, and 2013 pumping increased above the minimum amounts historical pumped. The increase in pumping in the BPW was primarily for aqueduct supply. With the increase in export pumping, depth-to-groundwater in all four indicator wells during the last year declined. All wells remain below baseline levels in April 2014, on average 5 ft.

The potential uses for recycled water that could be produced as a result of this study include landscape irrigation for community parks and commercial developments as well as restoration of devegetated parcels around the community (estimated to be approximately 180 acres). As much as half of the recycled water produced could be designated for reestablishing native vegetation on 180 acres of land bordering the town of Big Pine. Revegetation of this barren land is expected to reduce airborne particulate pollution and restore native habitat.

Direct Water-Related Benefit to a DAC

This is a planning study that ultimately intends to implement a construction project that will provide water-related benefits to a DAC. The Community of Big Pine, and the Big Pine Paiute Tribe Indian Reservation, both within an identified DAC, will receive up to 122 ac-ft of water for irrigating landscape and/or restoration areas, which would otherwise be supplied from a mix of treated and untreated surface water and pumped groundwater. Groundwater pumping has lowered the water table, and over the years springs and seeps have dried up, and meadows and grasslands have converted to scrublands. Cost savings would be realized by reducing the amount of water requiring treatment to drinking water standards. Recycled water can provide a locally-produced, reliable, and drought-proof supply of water for irrigation and restoration.

Project Performance Monitoring Plan

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a Project Performance Monitoring Plan is not required per the PSP.

Cost-Effectiveness Analysis

This is a planning study that eventually intends to provide direct water-related benefits to a project area entirely comprised of a DAC and not intending to complete construction with this solicitation. As such, a Cost Effectiveness Analysis is not required per the PSP.