



Mojave Water Agency
13846 Conference Center Drive
Apple Valley, CA 92307

October 2019

Mojave Water Agency
**INTEGRATED MODEL
DEVELOPMENT AND ALTERNATIVES
EVALUATION PROJECT**

WaterSMART: Applied Science Grant
FY 2019
Funding Opportunity Announcement No. BOR-DO-19-F012

Location: San Bernardino County, CA



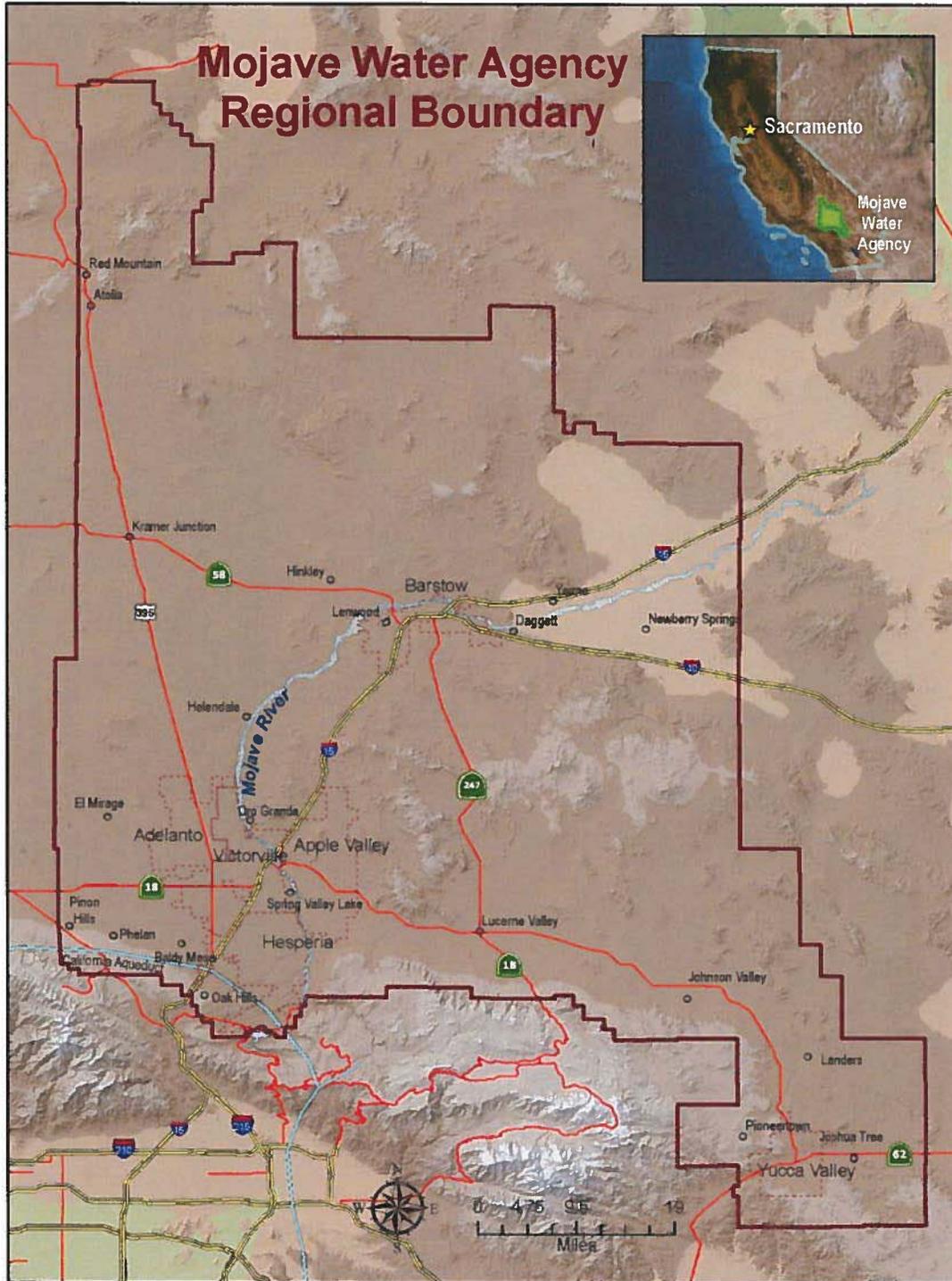
2. Mandatory Federal Forms

SF424 Application for Federal Assistance

SF424A Budget Information – Non-Construction Programs (More information on this is located in Section 6 Project Budget)

SF424B Assurance Non-Construction Programs

SF424 – Item 14: “Areas Affected by Project”



Mojave Water Agency is a water purveyor within the State of California and is part of San Bernardino County. The cities it encompasses include Adelanto, Apple Valley, Barstow, Hesperia, Victorville and Yucca Valley.

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Integrated Model Development and Alternatives
Evaluation Project**

**WaterSMART: Applied Science Grants for FY 2019
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**Project Location
Mojave Water Agency
San Bernardino County, CA**

Applicant

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October 30, 2019

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5. Technical Proposal and Evaluation Criteria

5.1 Executive Summary

Date: October 30, 2019
Applicant Name: Mojave Water Agency (MWA or Agency)
City, County, State: Apple Valley, San Bernardino, California

Summary of Benefits to Achieve FOA Goals

The Mojave Water Agency (MWA or Agency) is requesting federal funding to assist the Agency in funding its Integrated Model Development and Alternatives Evaluation Project (Project). The Project is divided into the following two major components:

- Expanding and refining the MWA’s existing groundwater modeling capability by developing a fully integrated groundwater / surface water model, and
- Applying the integrated model in performing comprehensive evaluations of alternatives to improve water management within the Agency’s service area.

The Agency seeks \$150,000 of funding from the WaterSMART Applied Science grant program to assist in developing this integrated model and in applying it to aid in formulation of water management alternatives and in assessment of their impact on conjunctive water use management. As a water agency in California, MWA qualifies as a “Category A” applicant. If WaterSMART funding is awarded, the Agency anticipates a two-year schedule with activity beginning in June 2020 and completion in April of 2022.

The Agency views implementation of effective water management and water conservation projects as powerful tools that will prepare the Agency’s service area for future droughts in a way that is preferable to enforcement of water use restrictions imposed as reactions to foreseeable water shortages. Therefore, the primary objective of this Project is developing the capability to evaluate alternatives that:

- Enhance the Agency’s ability to conjunctively manage its water resources, and
- Have the potential to produce ancillary benefits such as from peak-period hydropower generation through pumped storage.

All costs for project administration and reporting would be borne by the Agency and are excluded from both the funding requested from Reclamation and the Agency’s cost share.

Funding Summary

Table 5.1 Funding Sources

Funding Source	Cost Share	Percentage
Local Cost Share (MWA internal funds)	\$150,000	50%
Reclamation	\$150,000	50%
Total	\$300,000	100%

5.2 Project Location and Background Data

The Mojave Water Agency was established in 1959 by an act of the California Legislature. The Agency was activated by a vote of the residents in 1960 to manage declining groundwater levels in the Mojave Basin Area, the Lucerne Valley and the El Mirage Basin. The Morongo Basin and Johnson Valley areas were annexed in 1965. MWA covers over 4,900 square miles spread over a hydrologically diverse region facing a unique set of water management issues.

Essentially, all water used within the MWA service area is pumped from the local groundwater basins. Groundwater adjudication proceedings were initiated in 1990 to control the impacts of rapid population growth on the local basins resulting in the Warren Valley Basin Judgment and the Mojave Basin Area Judgment, rulings that required additional surface water be imported into both basins to balance groundwater extractions.

In implementing these judgments, the Agency serves as the Watermaster for the Mojave Basin Area Judgment and is the contractor for State Water Project (SWP) water delivered from the Bay-Delta to the Agency's service area. MWA has an annual contract for up to 89,800 acre-feet from the SWP, a quantity that includes 25,000 acre-feet of annual entitlement purchased from Berrenda-Mesa Water District in 1998 and 14,000 AF of annual entitlement purchased from Dudley Ridge Water District in 2009. The allocation from the Dudley Ridge purchase is being transferred to MWA incrementally with the last portion of this purchase resulting in the 4,000 AFY increase on total Table A allocation set to take place in 2020.

Water imported from the California Bay-Delta is introduced into the MWA's extensive groundwater recharge facilities to replenish groundwater pumped by individuals and by retail water suppliers, all within the confines of the adjudication. **Appendix A – Figure 1** displays the location of the Mojave Water Agency within the State of California. **Appendix A – Figure 2** shows the regional boundary of the Agency, while **Appendix A – Figure 3** shows areas included in the adjudication.

Concerns over the SWP's future ability to supply water to MWA and other contractors have brought into clear relief the need to strengthen ongoing water management and conservation programs and to augment the toolbox the Agency has available to analyze water management project alternatives and their operations. To place MWA's stewardship of water into perspective, data provided by MWA show total production in the service area during 2015 to have been 134,238 AF, a reduction from the rate of production during 2005 of 156,181 AF due to conservation efforts and implementation of the adjudication. This Project would complement the MWA's recognized success in reducing per capita demand, by developing and applying a tool to aid the Agency in evaluating alternatives to increase the security and reliability of water supplies.

Geographic Location – The Agency is located in the California High Desert area of San Bernardino County, approximately 90 miles northeast of downtown Los Angeles. The area lies on the northeastern flanks of the San Bernardino and San Gabriel mountains which separate the High Desert from the coastal basins and inland valleys of the greater Los Angeles area. The Mojave River is the main surface water feature within the MWA service area. Municipalities within the Agency's boundaries include Adelanto, Apple Valley, Barstow, Hesperia, Victorville

and Yucca Valley. Interstate 15 is the central east-west artery running through the Agency, while US 395 is the main north-south highway.

Water Supply and Rights – Average rainfall within the lower-lying areas of the Mojave Basin Area and the Morongo Basin/Johnson Valley Area is roughly five inches per year. **Appendix A - Figure 4** shows the distribution of average annual precipitation in the Agency’s service area.

MWA's water supply imported from the California Bay-Delta rests on a contractual entitlement of up to 85,800 AFY from 2015 to 2019; and 89,800 AFY from 2020 to 2035. Since 2005, MWA purchased less than its available yearly allocation, on average 24,600 AFY (2017 DWR Delivery Capability Report, Table 7, Historical SWP Deliveries, Calendar Years 2007-2016). This water is brought into MWA through various conveyance facilities and then distributed throughout the service area for groundwater recharge with operation of recharge and recovery facilities governed by the judgments described above.

Table 5.2 provides the long-term average water supply conditions and *does not take into account either acute drought periods or reductions in the reliability of SWP deliveries anticipated to result from climate change and other factors*. Additionally, **Table 5.2** does not reflect basin management practices such as locally over-drafted areas in the aquifer or areas of surplus due to groundwater banking. Because of the factors noted above, water supply shortages could occur by 2030 or sooner, depending on the success of the MWA’s conservation programs in reducing the Agency’s reliance on imported water.

Table 5.2 Summary of Current and Planned Water Supplies (AFY)

Water Supply Source	2015	2020	2025	2030	2035	2040
Imported Supplies						
SWP ^{(a)(b)}	53,196	55,676	55,676	55,676	55,676	55,676
Yuba Accord Water	0	600	600	600	600	600
Local Supplies						
Net Natural Supply	57,349	57,349	57,349	57,349	57,349	57,349
Return Flow	47,825	52,356	54,471	57,057	59,727	62,157
Wastewater Import	2,773	2,800	2,800	2,800	2,800	2,800
Total Supplies	161,143	168,781	170,896	173,482	176,152	178,582
Projected Demand	138,009	148,366	153,186	159,079	165,164	170,700

- a) Assumes 62% of Table A amount based on the California DWR State Water Project Delivery Capability Report 2017.
- b) Historically underutilized/unpurchased due to lack of local funding and affordability.

Water Use and Users Served – Water imported and recharged by the Agency is pumped by individuals and retail water purveyors within the Agency’s service area. There are over 30 retail purveyors that provide water service to most residents within the MWA service area through approximately 145,000 connections.

Current and Projected Water Demand - Data provided by MWA show total production in the service area during 2015 to have been 138,009 AF, a reduction from the rate of production during 2005 of 166,280 AF due to conservation efforts and implementation of the adjudication

(Kennedy/Jenks, 2016). Projected water use for the entire MWA service area is calculated by multiplying the per capita water use (estimated from 2010 to 2015 purveyor data) by population projections from the MWA Population Forecast conducted by Beacon Economics in December 2015 for the regional Urban Water Management Plan. Projected water demand can be found in **Table 5.2** above. It is important to note that while MWA has a large Table A allocation, it currently uses only a small portion to meet demands. Table A is the amount of water that MWA has the right to receive through the SWP. However, DWR determines the ‘reliability’ of the Table A amounts every year, and in years that may be drier, the available amount of Table A “wet water” is reduced. Thus, an agency may only receive a portion of its Table A when those “wet” supplies are less available. Despite this, MWA’s Table A allocation is still a contractual ‘commodity’, in that it can be used to assist other water agencies meet their reliability requirements via exchanges and transfers. For example, MWA can exchange their Table A, not as ‘wet water’ but contractually as what is referred to sometimes as ‘paper water’. As the adjudications becomes fully implemented, MWA’s demands will increase over time and the region will have the financial mechanisms in place to purchase more of its Table A allocation. In the meantime, MWA has storage for wet water and available Table A, which will ultimately form a resilient water portfolio together that will not only benefit the region but can benefit multiple SWP contractor partners across the state.

Water Delivery System – Appendix A - Figure 5 shows the Agency’s existing and planned water conveyance, recharge and recovery facilities including pipelines, pumping plants, recharge areas and wells.

To distribute water from the California Aqueduct to the points of need, MWA has taken a central role in designing and constructing the Morongo Basin and Mojave River pipelines, which extend from the California Aqueduct. The Morongo Basin Pipeline was completed in 1994 and deliveries began in 1995 to the Hi-Desert Water District. Water flowing through the pipeline is diverted to recharge ponds in an effort to reduce overdraft in the Warren Valley Basin. The MWA also financed and constructed the enlargement of Reach 1 of the Morongo Basin Pipeline to facilitate artificial recharge of the Alto Subarea along the Mojave River in the vicinity of Hesperia and Apple Valley. The Mojave River pipeline was completed in 2006 and extends from the California Aqueduct through Barstow, and east to Newberry Springs. The Hodge and Lenwood Recharge sites, located west of Barstow, have been completed as have the Daggett and Newberry Springs recharge sites, east of Barstow.

MWA also owns and operated the “Upper Mojave River Groundwater Regional Recharge and Recovery” (R3) Project, for which Reclamation provided significant financial support. The project delivers SWP water from the California Aqueduct in Hesperia to recharge sites in the floodplain aquifer along the Mojave River in Hesperia and southern Apple Valley. R3 Project wells on either side of the Mojave River located immediately downstream of the recharge area recover and deliver the potable stored water through pipelines directly linked to retail water agencies. Utilizing R3 for basin management offsets these agencies’ need to continue excessive pumping within the declining regional aquifer system. This allows the MWA to manage recharge and extractions and takes advantage of underutilized infrastructure that could easily be included and utilized for a pumpback scenario, in an area that is highly monitored with a high degree of

control. It should also be noted that the future phases of the Amethyst Basin project, also funded in part by Reclamation, could also be utilized in a groundwater recharge banking program.

Potential Shortfalls — MWA evaluates potential water supply shortfalls within the context of the Integrated Regional Water Management Act, initiated in 2002 by California State Senate Bill 1672. Drought probability, severity and response are analyzed in greater detail in MWA’s 2015 Urban Water Management Plan. Demand for imported SWP water, primarily used for mitigating groundwater overdraft, averaged approximately 22,400 AFY per year over the past decade and is projected to increase to 55,676 AFY by 2040.

The 2015 SWP Reliability Report from the State of California predicts that Sierra Nevada snowpack will diminish by 25 to 40 percent from the historical average by mid-century, a reduction with profound implications on the future reliability of SWP deliveries. Water suppliers and water users are deeply concerned over this forecast, which underscores the importance of drought resiliency projects for preserving the economic health of the region.

Past Working Relationships with Reclamation – The Agency has enjoyed an effective partnership with Reclamation through implementation of several programs. Recent projects implemented by the Agency thanks to Reclamation support are noted in **Table 5.3**, below:

Table 5.3 Past Working Relationship with Reclamation

Grant	Project	Amount Awarded	Date Awarded
USBR Water Supply Management Studies MOU No. RIOMU350020	Phase I: Evapotranspiration Water Use Analysis of Salt Cedar and other Vegetation in the Mojave River Flood Plain, 2007 and 2012	NA	August 2011
USBR Challenge Grant No. R09AP35R21	Oro Grande Wash Groundwater Recharge (Amethyst Basin)	\$3,456,660	October 2012
USBR Title XVI Grant No. R10AC35R15	Regional Recharge and Recovery (R3)	\$10,997,056	May 2013
USBR Water Management Studies Agreement No. 08FC350246	Upper Mojave River Groundwater Regional Recharge and Recovery Feasibility Study	\$110,000	September 2009
USBR Water Supply Management Studies No. RIOMU350020	Phase II: Mojave River Watershed Climate Change Assessment to support the Mojave IRWM	NA	September 2013
USBR Technical Service Center Irrigation Analysis	Mojave Water Agency Baja Subarea Irrigation Efficiency Analysis	\$100,000	November 2014
USBR BSA Crop Conversion Economic Analysis	Economic Analysis of Three Crop Conversion Scenarios in Mojave Water Agency’s Baja Subarea	\$100,000	January 2015
USBR WaterSMART Grant No. R15AS00002	CII Turf Replacement Program	\$300,000	July 2015

USBR WaterSMART Grant No. R16-FOADO-004	CII Turf Replacement Program	\$300,000	October 2017
USBR WaterSMART Grant No. BOR-DO-17-F012	CII Turf Replacement Program	\$300,000	December 2019
USBR WaterSMART Grant No. BOR-DO-18-F008	City of Adelanto Connection to R3 Pipeline	\$300,000	June 2018
USBR Water Supply Management Study R16-MU-35-0041	Mojave River Alto Transition Zone Analysis of Streamflow Conveyance in the Context of Environmental Compliance	Not yet available	December 2017
USBR WaterSMART Grant No. BOR-DO-19-F006	Long-Term Water Management/Water Banking Program	Not yet available	Not yet available
Prepared by: USBR Lower Colorado Region- Engineering Services Office	Draft – Exploration of Potential Modification of Mojave Dam		Completed September 2019

Past WaterSMART Grant Results

Subsequent to adoption of the Integrated Regional Water Management Plan (IRWMP), the Agency applied for funding from the California Department of Water Resources (DWR) to initiate the *Cash for Grass Turf Replacement Program*. The first phase of this program began in February 2008 and was supported by bond funds from the State of California’s Proposition 50. A second phase of the turf replacement program was self-funded, and the third phase is being supported by funds from the State of California’s Proposition 84. The *Cash for Grass Program* targeted removal of turf from residential and small commercial landscapes and provided the Agency with the experience and expertise needed to formulate the *CII Turf Replacement Program* which refined the Agency’s existing turf replacement program by targeting commercial, industrial and institutional users.

In 2018, MWA applied for funding under the WaterSMART: Drought Response Program for the City of Adelanto Connection to R3 Pipeline Project. The goal of this pipeline project is to improve the City of Adelanto’s drought resiliency by delivering imported SWP water from the MWA’s Upper Mojave River Groundwater Regional Recharge and Recovery Project (R3) to the City of Adelanto; an underserved part of the MWA’s service area. The new pipeline will reduce groundwater overdraft in the Regional Aquifer, thereby providing drought resiliency and increasing the reliability of Adelanto’s water supply. In 2019, a Long-Term Water Management and Water Banking Project was applied for by MWA under the USBR WaterSMART Water Marketing Strategy Grant. This project would restart the collaborative process with other SWP Contractors, including Metropolitan, to update and implement a long-term strategy to store SWP water within the Mojave region as well as complete associated, and necessary environmental documentation. If funding is awarded, identified benefits from this project would include enhanced local water security, being able to leverage available storage, develop a consistent source of outside funding, better manage imported water that is brought into the region, and assist with state-wide water supply reliability. As of the time of this grant submission, MWA is awaiting notification of the funding decision on the Long-Term Water Management and Water Banking Project application.

5.3 Technical Project Description and Milestones

The *Integrated Model Development and Alternatives Evaluation Project* entails completion of the following two major components:

1. The development of an integrated groundwater and surface water computer model, and
2. Application of the model for developing and evaluating alternatives whose benefits depend on understanding of interactions between groundwater and surface water.

Upon completion of this Project, MWA and water users in its service area will benefit by:

- ✓ Having a working computer model capable of processing input data for both groundwater and surface water parameters in the Mojave River drainage basin.
- ✓ Improving conjunctive water management and water supply reliability by enhancing understanding of critical regional water issues, allowing for the evaluation of alternatives for operation of the Mojave River Dam, development of groundwater banking projects, and investigation of project alternatives having ancillary features such as pumped storage to improve the ability to match power generation capacity with energy demands.

Scope of Work – The *Integrated Model Development and Alternatives Evaluation Project* will build upon the capability of MWA’s existing Modflow groundwater model, initiated in 2006 and recently updated in 2019. Model development under this Project will expand the capabilities of the groundwater model to enable it to represent the surface water hydrology of the Mojave River drainage basin including the following surface water features and potential water banking sites critical to conjunctive water management in the basin:

- Mojave River Dam – U.S. Army Corps of Engineers facility;
- Silverwood Lake / Cedar Springs Dam – DWR facility;
- Deep Creek and Rock Springs Recharge facilities, and
- Upper Mojave River Groundwater Regional Recharge and Recovery (R3) Project.

Developing the ability to store water behind the Mojave River Dam for regulated releases would enable each of the other facilities named above to be utilized to move water captured from local sources and delivered from the SWP to be stored / banked in reservoirs and groundwater recharge and recovery infrastructure throughout the MWA service area.

Development of the computer model will be undertaken by the Agency with the support of qualified technical consultants. Project costs to be covered under a grant agreement are included in Section 6. If the Project is awarded funding from Reclamation, implementation is anticipated to begin in June 2020 and is projected to continue for two years ending in April 2022.

Implementation of the Project is expected to begin in June 2020 and is projected to continue for two years until April 2022.

Project Tasks - Project implementation has been divided into the following five tasks:

- 1) Grant and Project Administration;
- 2) Reporting;
- 3) Integrated Model Development;
- 4) Model Application for Evaluation of Alternatives, and
- 5) Webinar Presentation of Model Development and Application.

The Agency will manage each of these tasks with the active involvement of Reclamation.

Task 1: Grant and Project Administration

Work to be performed under this task entails coordination of all Project activities, including budget, schedule, communication, and grant and cost-share administration (preparation of invoices and maintenance of financial records). All costs for this task will be borne within the Agency's normal operating budget. Therefore, no federal funds are being requested for this activity and the staff time devoted to this work will not be included in the Agency's cost share.

Deliverables: (1) review of USBR Grant Agreement; (2) project kick-off meeting with USBR personnel; (3) preparation of invoices and maintenance of financial records; (4) preparation of grant reimbursement requests; and (5) other deliverables as required.

Task 2: Reporting

This task involves reporting on the financial status and Project progress to Reclamation. In addition of semi-annual progress reports, a final project report will be submitted within 90 days of Project completion. The Project will also comply with any other reporting requirements specified in the Grant Agreement. All costs for this task will be borne within the Agency's normal operating budget. Therefore, no federal funds are being requested for this activity and the staff time devoted to this work will not be included in the Agency's cost share.

Deliverables: Submission of semi-annual and final reports as specified in the Grant Agreement.

Task 3: Integrated Model Development

Subtask 3.1: Consultant Selection

Upon notification from Reclamation of award of federal funding, the MWA will develop an RFP for consulting services based on the scope of work presented in this application. The purpose of the RFP will be to solicit proposals from consulting firms qualified to support MWA staff in development and application of the integrated model. The RFP will be issued upon signing of the grant agreement, and the consultant selection process will be completed within three months of signing. All costs for this task will be borne within the Agency's normal operating budget. Therefore, no federal funds are being requested for this activity and the staff time devoted to this work will not be included in the Agency's cost share.

Deliverables: Preparation and issuance of an RFP for modeling services and selection of a consulting firm with the capabilities to support MWA in completion of the Project.

Subtask 3.2: Model Selection

The consultant, working together with MWA staff, will review the MWA groundwater model and available groundwater and surface water data sets and will recommend a modeling platform to be the foundation of the integrated groundwater / surface water model. Broad options for the modeling platform include:

- a modeling approach that links surface water modules to the MWA's established groundwater model (coupled model structure), or
- an approach that relies on groundwater data sets used in the MWA model together with available surface water data as inputs to a public-domain integrated modeling platform (integrated model structure).

Deliverable: Submission of a Technical Memorandum describing the model selection process and the recommended modeling platform.

Subtask 3.3 Model Development

Using the modeling platform selected in the preceding task and working closely with MWA staff, the selected consultant will rely on available data on groundwater and surface water hydrology to develop the integrated groundwater / surface water model. If the recommended modeling platform differs from that used in the MWA groundwater model, the MWA model will be used as tool for development of the integrated model and for model calibration.

Appendix A - Figure 6 shows the geographical boundaries of the existing MWA groundwater model and of the area that would be integrated with a surface water model to form the extent of the proposed integrated model.

Deliverables: Submission of a Technical Memorandum describing the structure of the integrated model and executable code necessary for operation of the model, preparation of input data and analysis of outputs.

Subtask 3.4: Model Validation and Calibration

MWA staff will supervise the selected Consultant in use of industry-accepted model validation and calibration practices to prepare the integrated groundwater / surface water model for use in modeling of alternatives based on operation of the Mojave River Dam, proposed groundwater banking opportunities and other scenarios requiring understanding of groundwater / surface water interactions.

Deliverables: Submission of a Technical Memorandum describing model validation and calibration procedures and the results of these procedures.

Subtask 3.5: Program Outreach and Technical Review

MWA will use its existing Technical Advisory Committee (TAC) processes to form a standing TAC dedicated to advising the Project team on development and application of the model. In MWA, a TAC acts as an independent, voluntary group of water purveyors; pumpers; NGOs; county, state and federal agencies; and other interested parties. The TAC would meet in a public forum every two months to discuss progress on the modeling effort and to assist the MWA and the consulting team selected to support the Project with technical, professional, economic, and community recommendations.

Deliverables: On-going technical review of the model by the TAC.

Task 4: Model Application for Evaluation of Alternatives

The calibrated integrated model will be applied to refine and evaluate conjunctive management alternatives that have been developed by the MWA. These alternatives will be based on those presented in the report *Exploration of Potential Modification of Mojave Dam* (September 2019) developed by Reclamation's Lower Colorado Region Engineering Services Office to assess the impacts of various alternatives on groundwater recharge and streamflow of storage and release of stormwater flows and/or imported water in Mojave River Dam and will also examine operation of alternatives developed through the MWA's *Long-term Water Management/ Water Banking Program*.

The specifics of alternatives to be modeled will be determined by the MWA. Opportunities to be assessed through evaluation of alternatives will include

- Storage/ banking of water for other SWP contractors;
- Hydropower generation/ pumped storage, and
- Stormwater capture.

Deliverables: Technical Memorandum on methodology and results of the evaluation of alternatives. The alternative evaluations will include economic analyses assessing the costs, benefits and feasibility modeled alternatives.

Task 5: Webinar Presentation of Model Development and Application

The MWA will work with Reclamation staff to develop a webinar describing the Project and will present the Webinar as well as making it available on the WaterSMART website.

Deliverable: Webinar presentation which may be open to the public and may be made available on the WaterSMART website at Reclamation's discretion.

5.4. Evaluation Criteria

5.4.1 Evaluation Criterion A: Benefits to Water Supply Reliability

1. *Describe the water management issue(s) that your project will address. Describe the severity of the water management issues to be addressed through the project.*

The Mojave Water Agency lies in an arid region of California with growing demands placed on its limited, and increasingly uncertain, water supply. The Agency's main mechanism for providing a reliable water supply to users within its service area has been a successful program of conjunctive water management where surface water available from the State Water Project and from local rivers and streams recharges aquifers that are the source of the region's water supplies.

The purpose of the Integrated Groundwater / Surface Water Modeling Project is to add an important tool to enable the Agency to better exercise its conjunctive management program by exploring alternatives to improve management of flows in the Mojave River through operation of the Mojave River Dam, investigate operation of existing and potential water banking projects and assess the viability of development of a pumped storage project at Silverwood Lake.

2. *Explain how the project will address the water management issues identified in the response to the preceding bullet. In your response, please explain how your project will contribute to one or more of the following water management objectives and provide support for your response:*

i. water supply reliability

The central purpose for development of an integrated groundwater / surface water model is to better understand groundwater / surface water interactions along the Mojave River and to apply this understanding to guide evaluation of proposed conjunctive management programs. In particular, the model will be used to improve integration of operation of the Mojave River Dam for flood control with potential water banking and pumped storage initiatives.

ii. management of water deliveries

MWA non-potable water facilities are used to deliver water directly to turnouts for groundwater recharge. The R3 project delivers wholesale potable groundwater, previously recharged from the SWP, to area water purveyors. This infrastructure is essential for management of groundwater within the Agency's service area, which is the source that water users throughout the area rely on. Therefore, an integrated groundwater / surface water model will be a valuable tool for operation of the MWA's conjunctive management policy, which has the purpose of supporting the regional aquifers for the benefit of water users.

iii. water marketing activities

Since the late 1990's, MWA has been marketing water with other SWP contractors through various transfer and exchange mechanisms with groundwater banking sites within the MWA service area. This has provided secure locations to store water that are near the terminus of the East Branch of the SWP to provide drought reliability for partners in water marketing.

The MWA has also long held an interest in developing a long-term water banking and water marketing program and has constructed water banking facilities including the Regional Recharge and Recovery [R3] Project and the Amethyst Basin Project, two projects identified as important banking infrastructure in the report, *Technical Study to Evaluate a Potential Long-Term Water Management Program Between Mojave Water Agency and Metropolitan Water District (Bookman-Edmonston, SAIC; 2005)*.

Now that California has recovered from its recent prolonged drought, MWA has applied for funding from the WaterSMART Water Marketing Strategy Grant program (FOA No. BOR-DO-19-F006) to restart its collaboration with other SWP Contractors, including the Metropolitan Water District of Southern California (MWD), to update and implement a long-term strategy to store SWP water within the Mojave region.

The Integrated Model Development and Alternatives Evaluation Project will support development of long-term water banking projects by providing a valuable analytical tool for evaluation of banking alternatives.

iv. drought management activities

As discussed throughout this document, the central purpose for MWA to develop an integrated groundwater / surface water model is to help the Agency evaluate

conjunctive management projects and operations and other multiple-benefit projects made possible through effective conjunctive water management. The most important objective of conjunctive management is to recharge aquifer storage using surface water available during wet periods to provide a reliable water supply during droughts. The integrated model will be valuable for matching the volume and rate of surface water deliveries with the Agency's recharge capacity to maintain adequate reserves of groundwater and for investigation into how the conjunctive management program will need to be adjusted in the face of growing demands within the area.

v. *conjunctive use of ground and surface water*

Conjunctive use of groundwater and surface water is fundamental to the MWA's operation, as seen in the recharge and distribution facilities the Agency has completed to advance conjunctive use throughout its service area. The objective of this Project is to provide the Agency with a modeling tool developed specifically to aid in formulation and evaluation of conjunctive management alternatives and operational improvements. It additionally the model will provide the analytical capability to assess related operational improvements such as introduction of pumped storage.

vi. *water rights administration*

The integrated groundwater / surface water model will be a valuable tool for analyzing projects and operation scenarios to determine viable options considering the conditions of the Mojave adjudication.

vii. *ability to meet endangered species requirements*

Development of an integrated model will be useful in assessing groundwater / streamflow interactions and the impact of operational alternatives for facilities, such as for the Mojave River Dam, on endangered or threatened species. The Groundwater Dependent Ecosystems (GDEs) of the Transition Zone of the Mojave River contain six identified federally endangered or threatened species (least Bell's vireo, Southwestern willow flycatcher, Yellow-billed Cuckoo, desert tortoise, arroyo toad, and California red legged frog) according to the 2017 *Analysis of Streamflow Conveyance in the Context of Environmental Compliance* report for the Mojave River Alto Transition Zone. Improved groundwater / surface water modeling capabilities will better enable MWA to predict and mitigate potential consequences to vulnerable species in the area.

viii. *watershed health*

The application of an integrated model is unlikely to affect the health of the Mojave River Watershed upstream of the Mojave River Dam. However, alternatives for dam operation that could be investigated through modeling would consider the impact of these alternatives on downstream reaches of the river.

ix. *conservation and efficiency*

An objective of the integrated model will be to assess the efficiency of various reservoir operation, water banking and pumped storage alternatives to minimize losses due to evaporation and unrecoverable seepage. Another objective is to maximize the proportion of recharged water that can be recovered from the aquifer zones where it is stored. Therefore, while the integrated model is not viewed as a

demand-reduction tool, it is intended to identify alternatives that increase the efficiency of the Agency's water management practices.

x. *other improvements to water supply reliability.*

Given the extreme variability of the region's natural wet-dry weather cycle high quality hydraulic modeling of the watershed could prove invaluable in maximizing natural and imported water resources while simultaneously maintaining vital flood control efficiency of the Mojave River Dam. Infrequent wet year water supplies are crucial elements of the water supply to the Mojave Basin and, due to the often-significant magnitude of natural runoff events, robust flood control management is essential to the protection of life and property downstream. This model will contribute to a better understanding and more effective management of the river system and will help achieve the following objectives.

- a. More water stored in the upper basin of the Mojave River will directly support baseflow at the Lower Narrows stream gauge which measures the discharge from the area of the Transition Zone and that supports a 1-mile-wide desert riparian corridor.
- b. Leverages significant public investments to optimize operation of infrastructure for purposes including:
 - responding to climate change;
 - increasing long-term natural supply by reducing losses of stormwater to evaporation from desert playas;
 - supporting state-wide water supply reliability by banking water locally for future use by other SWP contractors, and
 - avoiding costly and environmentally damaging new surface water projects.
- c. Offers the potential to reduce energy demands, improve management of renewable energy and reduce greenhouse gas emissions by:
 - reducing pumping lifts needed for groundwater extraction by raising and stabilizing groundwater elevations through increased recharge, and
 - optimizing use of surface water facilities including the potential for development of pumped storage at Silverwood Lake.

3. *Describe the significance or magnitude of the benefits of the project, either quantitatively or qualitatively, in meeting one or more of the listed objectives.*

The proposed Integrated Groundwater / Surface Water Model Project will provide a valuable tool for enabling the Agency to assess the benefits and risks of water management alternatives with respect to many of the objectives listed above. As indicated in the preceding responses, the model is expected to be particularly useful for assessing the benefits of various alternatives associated with the following objectives:

- Water supply reliability;
- Water marketing activities;
- Drought management activities;
- Conjunctive use of ground and surface water, and

- Improved flood control.
4. *Explain how the project complements other similar efforts applicable to the area where the project is located. Applicant should make a reasonable effort to explore and briefly describe related ongoing projects.*

The Integrated Model Development and Application Project will complement and enhance related water management activities in the MWA service area. Among these are the Agency's efforts to:

- institute a Long-term Water Management / Water Banking Program;
- evaluate alternatives for operation of the Mojave River Dam, and
- assess the viability of pumped storage hydroelectric generation that would rely on the excess power now generated by renewable sources to pump water to Silverwood Lake for release to meet peak energy demands.

5.4.2 Evaluation Criterion B: Need for Project and Applicability of Project Results

Explain how your project will result in readily useful applied science tools that meet an existing need:

1. Does your project meet an existing need identified by a water resource manager(s) within the 17 Western States?
 - a. *Explain who has expressed the need and describe how and where the need for the project was identified.*
The need for the project has been identified by the MWA and its retail agencies as well as by prospective water banking partners. These parties recognize that development of an integrated groundwater / surface water model will be important for strengthening the MWA's ability to effectively manage the water resources available to the Agency.
 - b. *Provide letters of support from any resource managers, stakeholders or partners that have stated that they will benefit from the project.*
Letters of support are presented in Appendix B of this application.
2. Explain how the project will result in an applied science tool(s) or information that is readily applicable and be highly likely to be used by water resource managers in the West.
 - a. *How will the project results be used?*
The project results will give the Agency a better understanding of surface water / groundwater interactions. Improved understanding of the system will directly lead to better resource management, appropriate policy development, and more efficient future infrastructure for the Agency. The model results will additionally provide benefit to San Bernardino County Flood Control District, the U.S. Army Corps of Engineers, the many municipalities along the River corridor, as well as other private and public entities in proximity to the River.

- b. *Will the results of your project inform water resource management actions and decisions immediately upon completion of the project, or will additional work be required?*

The Project is divided into two phases. The first phase is development, calibration and validation of the integrated model. After validation, the model will then be used to evaluate alternatives for operation of the Mojave River Dam and of groundwater banking facilities. Therefore, work completed within the scope of the grant agreement will be of use in informing water resource management actions and decisions. The expectation is that the model will continue to be refined and applied after completion of the grant agreement and will become a standard tool for analysis of alternatives used by the Agency.

- c. *Will the results of your project be transferrable to other users and locations?*

The model will be used to assess project alternatives and operational scenarios specific to the MWA, and the modeling results can be used by other users and locations such as the San Bernardino County Flood Control District, the U.S. Army Corps of Engineers, the many municipalities along the river corridor, as well as other private and public entities in proximity to the river who may find this data helpful to achieving their goals. Furthermore, the model itself should be both transferrable and applicable to users engaged in analysis of conjunctive management and water banking facilities and operations for their own custom use.

- d. *If the applicant is not the primary beneficiary of the project, describe how the project beneficiaries have been or will be involved in planning and implementing the project?*

The applicant, the Mojave Water Agency, and water users within the applicant's service area will be the primary beneficiaries of the Project.

5.4.3 Evaluation Criterion C: Project Implementation

Describe your implementation plan

1. *Describe the objectives of the project and the methodology and approach that will be undertaken. Provide support for your methodology and approach.*

The objectives of the Integrated Model Development and Application Project are two-fold:

- Develop an integrated groundwater / surface water model of the Mojave River and underlying aquifer system based on the MWA's existing groundwater model and the extensive data on surface water flows, precipitation and other hydrologic parameters available for the watershed of the Mojave River.
- Apply this model to evaluate alternatives for operation of the Mojave River Dam designed to improve conjunctive water management. This will support drought resiliency within the MWA's service area and provide opportunities for development of long-term water banking and water marketing arrangements with other SWP contractors. These contractors would be those wishing to strengthen the reliability of their water supplies by using MWA facilities to recharge groundwater for recovery during droughts and in response to emergencies such as earthquakes.

2. *Describe the work plan for the project. Include an estimated project schedule that shows the stages and duration of the proposed work, including major task, milestones, and dates.*

The work plan for the Project is described under the scope of work presented above in Section 5.3. An estimated project schedule included as **Appendix A – Figure 7**.

3. *Describe the availability and quality of existing data and models applicable to the project.*

The integrated model will rely on current (2019) groundwater input files developed for the MWA's recalibrated Modflow groundwater model originally developed by USGS. The MWA regularly monitors a network of wells, and data from this monitoring program will be used to support development and calibration of the integrated model. Data for the surface water module of the integrated model will be drawn from the extensive period of record available from the network of USGS surface water gages in the study area. Additional information on the surface water gaging network is available at the following location -<http://www.mojavewater.org/regional-surface-water.html>.

- a. *Identify staff with appropriate credentials and experience and describe their qualifications. Describe the process and criteria that will be used to select appropriate staff members for any positions that have not yet been filled. Describe any plans to request additional technical assistance from Reclamation or via a contract.*

Lance Eckhart, PG, CHG, Director of Basin Management and Resource Planning for MWA, has been with the Agency since 2001 and will manage the Integrated Model Development and Application Project. Lance has directed numerous major scientific studies across the Agency's nearly 5,000 square-mile management area and been involved in long-term water management strategy since the 2000s. In addition to his knowledge of the Agency's operations, Mr. Eckhart has been responsible for the creation and implementation of 5 major local modeling projects over the last 18 years.

Tony Winkel, PE, PG, Senior Hydrogeologist/Engineer, for MWA will participate in model development and contribute technical expertise. Tony is an expert in Mojave River Basin aquifers and is knowledgeable in both current and historical groundwater and surface water dynamics of the region. He has modeling experience and understands hydraulic data sets relevant for the use of model development and application.

- i. *Have the project team members accomplished projects similar in scope to the proposed project in the past either as a lead or team member?*

Lance Eckhart has managed the following projects that are similar in scope to this Project.

- Directed the use of the 2001 USGS Modflow model for various resource management investigations to help support the Mojave Basin Area adjudication
- Principle in Charge for the Agency of the development of the 2006 Upper Mojave River Basin Groundwater Modeling Project (UMRBGMP)(see report). This model used (at the time) cutting edge modeling platforms developed in by the petroleum industry that publicly available groundwater modeling packages could not perform. This work was to mainly support the

design and later construction of the R3 program which was partially funded in 2008 (Agreement No. R10AC35R15) through the American Recovery and Reinvestment Act of 2009

- Principle in Charge for the Agency of updating the 2006 UMRBGMP to current, conversion to a modern version of MODFLOW and recalibration

Tony Winkel has studied the upper watershed, both personally and professionally, for the past several years. Furthermore, he studied groundwater modeling similar to the type to be developed in this Project during his time in graduate school. Throughout his career, he has engaged in many projects involving the analysis of weather, surface water, and groundwater data.

- ii. *Is the project team capable of proceeding with tasks within the proposed project immediately upon entering into a financial assistance agreement?*

Yes. As described in the Scope of Work presented in Section 5.3, the MWA is capable of proceeding immediately upon entering into a financial assistance agreement. The Agency has funds set aside in the current fiscal year and is fully prepared to bringing a consultant under contract to support Agency staff in implementation of the Project, establishing the TAC and proceeding with development of the integrated model.

- b. *Provide a summary description of the products that are anticipated to result from the project. These may include data, metadata, digital or electronic products, reports and publications.*

Products that are anticipated from the Project fall into two categories described in Section 5.3 – Scope of Work. During the Project’s first phase, which focuses on development of the integrated groundwater / surface water model, the work product will be a functional integrated model that is either founded on the MWA’s existing Modflow groundwater model or that applies data sets developed for this model. This product will include the executable model code, input data sets, metadata and technical memoranda describing the model, and its development, calibration and validation.

The Project’s second phase will emphasize application of the model to evaluate alternatives for operation of the Mojave River Dam, development of long-term water banking programs and other activities whose operations depend on clear understanding of the interactions between groundwater and surface water that will be analyzed through operation of the integrated model. These analyses will be documented in technical memoranda.

5.4.4 Evaluation Criterion D: Dissemination of Results

1. Describe how the tools, frameworks, or analyses being developed will be disseminated, communicated, or made available to water resources managers who may be interested in the results.
 - a. *If the applicant is the primary beneficiary of the project, explain how the project results will be communicated internally, and to interested stakeholders and interested water resources managers in the area, if appropriate.*

The MWA is the primary beneficiary of the Project since the model will be used to assess project alternatives and operational scenarios specific to the Agency. However, the modeling results can be applied by other users and at other locations such as the San Bernardino County Flood Control District, the U.S. Army Corps of Engineers, the many municipalities along the river corridor, and other private and public entities in proximity to the river who may find this data helpful for achieving their goals.

Avenues for dissemination of tools, frameworks and analyses developed during the life of the project will include:

- Regularly update the TAC and request input from public
- Regularly update MWA Board in public meetings
- Work with Reclamation, U.S. Army Corps of Engineers, San Bernardino County Flood Control District and DWR technical staff from Project kick off to conclusion to ensure all parties are in the loop and can help guide model development, alternative testing, and data sharing.
- Ensure conformity with Mojave Basin Area adjudication by having the Watermaster Engineer as part of the project team.

b. If the applicant is not the primary beneficiary of the project (e.g., universities or research institutes) describe how project results will be communicated to project partners and interested water resources managers in the area.

As noted above, the applicant is the primary beneficiary of the Project.

c. Explain why the chosen approach is the most effective way to disseminate the information to end users in a usable manner.

The TAC, as an open forum with participants including a broad spectrum of stakeholders, will be the primary vehicle for disseminating information to end users. Given its stakeholder-driven, bi-monthly format, the TAC is expected to be widely attended and accessible by interested parties. Since MWA first introduced the TAC process in the early 2000's, the Agency's experience is that TACs have proven to be an excellent way to openly share information, get feedback and avoid conflict.

5.4.5 Evaluation Criterion E: Department of Interior Priorities

1. Creating a conservation stewardship legacy second only to Teddy Roosevelt
 - a. utilize science to identify best practices to manage land and water resources and adapt to changes in the environment;*
The purpose of the integrated groundwater / surface water model to be developed by this Project is to enable the MWA to better assess the benefits and shortcomings of alternatives the Agency formulates to improve water management within its service area. The model will enable the Agency to evaluate the long-term performance of proposed actions to determine their effectiveness in helping the Agency adapt to changes in a range of environmental and water supply conditions including changes in land uses and in deliveries of water from the State Water Project.
 - b. examine land use planning processes and land use designations that govern public use and access;*

This water resource model development and application project is expected to have little impact on the land use planning processes and land use designations.

- c. revise and streamline the environmental and regulatory review process while maintaining environmental standards;*

The proposed modeling project is expected to have little impact on the environmental and regulatory review process.

- d. review DOI water storage, transportation, and distribution systems to identify opportunities to resolve conflicts and expand capacity;*

While the integrated groundwater / surface water to be developed by this Project has the potential to be applied to DOI facilities, the work performed under the proposed Project does not encompass federal facilities.

- e. foster relationships with conservation organizations advocating for balanced stewardship and use of public lands;*

The proposed Project is not expected to influence relationships with conservation organizations advocating for balanced stewardship and use of public lands.

- f. identify and implement initiatives to expand access to DOI lands for hunting and fishing;*

The proposed Project is not expected to influence access to DOI lands for hunting and fishing.

- g. shift the balance towards providing greater public access to public lands over restrictions to access.*

The modeling performed under the proposed Project is not expected to have any impact on access to public lands as lands within the study area are now open to public access and are expected to remain open.

2. Utilizing our natural resources

- a. ensure American Energy is available to meet our security and economic needs;*

Alternatives likely to be evaluated using the integrated model include development of a pumped storage facility at Silverwood Lake. The purpose of this facility would be to store energy generated by various sources to provide capacity needed during peak demand periods.

- b. ensure access to mineral resources, especially the critical and rare earth minerals needed for scientific, technological, or military applications;*

The proposed Project is not expected to influence access to mineral resources.

- c. refocus timber programs to embrace the entire 'healthy forests' lifecycle;*

The proposed Project is not expected to influence timber programs.

- d. manage competition for grazing resources*

The proposed Project is not expected to influence competition for grazing resources.

3. Restoring trust with local communities

- a. Be a better neighbor with those closest to our resources by improving dialogue and relationships with persons and entities bordering our lands;*

Although not an explicit part of the Project scope, the integrated groundwater / surface water model is expected to evolve into an important tool for communicating how various alternative configurations and modes of operation will affect groundwater resources in areas bordering the MWA. The TAC will be an important mechanism for improving dialogue and relations with neighboring areas.

- b. *Expand the lines of communication with Governors, state natural resource offices, Fish and Wildlife offices, water authorities, county commissioners, Tribes, and local communities.*

Similar to the preceding response, an integrated groundwater / surface water model can be a valuable tool for communicating with stakeholders and for formulating alternatives that respond to the concerns of state, county, tribal and local officials.

4. Striking a regulatory balance

- a. *Reduce the administrative and regulatory burden on U.S. industry and the public;*
The proposed Project is expected to have no effect on the administrative and regulatory burden imposed on U.S. industry and the public.

- b. *Ensure that Endangered Species Act decisions are based on strong science and thorough analysis.*

The proposed Project is expected to support application of strong science and analysis to Endangered Species Act decisions.

5. Modernizing our infrastructure

- a. *support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure;*

The integrated groundwater / surface water model that would be the main product of this Project has the potential to be applied to evaluate alternatives that would advance public / private partnerships to modernize U.S. infrastructure.

- b. *remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs;*

The model will be applied to evaluate alternatives with the objective of strengthening water management within the Agency's boundaries. Efforts to improve the reliability of the area's water supply will likely include construction of new infrastructure.

- c. *prioritize DOI infrastructure needs to highlight:*

1. *construction of infrastructure,*
2. *cyclical maintenance, and*
3. *deferred maintenance.*

As noted in the response to question 1.d, above, the integrated model will be initially applied to assess alternatives that do not include DOI infrastructure.

5.5 Data Management Practices

No specific data management practices have yet been created for this Project. Note that this Project will involve integrated groundwater and surface water modeling, and thus data management practices will be developed throughout the Project to accommodate the specific modeling technique(s) decided upon.

6. Project Budget

6.1 Funding Plan and Letters of Commitment

(1) How you will make your contribution to the cost share requirement, such as monetary and/or in-kind contributions and source funds contributed by the applicant (e.g., reserve account, tax revenue, and/or assessments).

MWA plans on using a combination of credit for matching fund for our large water banking program that will kick off during the first quarter of 2020 and/or cash.

(2) Describe any in-kind costs incurred before the anticipated project start date that you seek to include as project costs. Include:

The Agency does not plan to include in-kind costs in the budget for this Project.

(3) Provide the identity and amount of funding to be provided by funding partners, as well as the required letters of commitment.

No funding partners are involved in this Project, and thus no letters of commitment are necessary.

(4) Describe any funding requested or received from other Federal partners.

There are no other Federal partners for the proposed Project.

(5) Describe any pending funding requests that have not yet been approved and explain how the project will be affected if such funding is denied.

There are no pending funding requests for this Project. MWA does have an outstanding application for a WaterSMART Water Marketing Strategy Grant, however, if awarded, this grant would support a different project.

Table 6.1 summarizes non-federal and federal sources of funding for the proposed Project.

Table 6.1 Summary of non-Federal and Federal Funding Sources

Funding Sources	Funding Amount
Non-Federal Entities	
1. MWA funds	\$150,000
<i>Non-Federal Subtotal</i>	<i>\$150,000</i>
Other Federal Entities	
1. Not applicable	\$0
<i>Other Federal Subtotal:</i>	<i>\$0</i>
<i>Requested Reclamation Funding:</i>	<i>\$150,000</i>
<i>Total Project Funding:</i>	<i>\$300,000</i>

6.2 Budget Proposal

The Agency proposes to apply all Federal and Non-Federal funds that may be associated with the grant agreement to funding of development of the integrated groundwater / surface water model and to its application in formulating and evaluating alternatives for conjunctive management of the Mojave River. The Non-Federal Cost Share consists of \$150,000 of dedicated MWA funds. In addition to the funds from the proposed grant program to support model development and application, administrative support to the Project will be provided by the Agency.

A summary of the estimated Project costs by funding source is presented in **Table 6.2**. **Table 6.3** has been prepared following the “Budget Proposal” outline from the FOA in support of the budget estimates in **Table 6.2**.

Section 5.3 (Technical Project Description) of this application presents a Scope of Work describing tasks necessary for the successful completion of the Project. The Federal and local cost share funding will be used to cover all costs associated with staff, consultant and contract employee time required to perform the Scope of Work.

Table 6.2 Project Funding Sources

FUNDING SOURCES	PERCENT OF TOTAL PROJECT COSTS	TOTAL COST BY SOURCE
Agency Funding	50%	\$ 150,000
Reclamation Funding	50%	\$ 150,000
Other Federal Funding	0%	\$ -
TOTAL PROJECT COSTS	100%	\$ 300,00

Table 6.3 Budget Summary - Aggregate of Project Costs

BUDGET ITEM DESCRIPTION	COMPUTATION		QUANTITY TYPE	TOTAL COST
	\$/Unit	Quantity		
SALARIES AND WAGES				\$ -
FRINGE BENEFITS				\$ -
TRAVEL				\$ -
EQUIPMENT				\$ -
SUPPLIES/MATERIALS				\$ -
CONTRACTUAL				\$ 300,000
ENVIRONMENTAL/REG. COMPLIANCE				\$ -
OTHER				
TOTAL DIRECT COSTS				
INDIRECT COSTS - 0%				\$ -
TOTAL ESTIMATED PROJECT COSTS				\$ 300,000

6.3 Budget Narrative

Applicant Contributions (Non-Federal Cost Share)

The following discussion addresses budget line items required for completion of the Project. Table 6.3 displays the Project budget and includes explanatory notes.

Salaries, Wages, and Fringe Benefits

Lance Eckhart, PG, CHG, Director of Basin Management and Resource Planning, for the Agency will be the representative for the Applicant and will provide overall Project Management. Administration and reporting will be performed by the Agency’s office personnel. In this regard, the Agency’s office staff, which will consist of a Senior Project Manager, staff Professional Engineer, staff Professional Geologist, staff Certified Hydrogeologist and an Administrative Assistant, will perform project-related administration support and grant reporting. Additionally, the Agency will use accounting staff for tracking costs, maintaining financial records and invoicing. Work performed by Agency staff will be completed as part of the Agency’s daily operations and will not be included as part of the local cost share commitment.

The Agency will not be asking for reimbursement or reporting any “In-Kind” contributions for any Salaries and Wages costs. The Agency is proposing not to track these costs separately from daily operations, even though employees will be providing services necessary for implementation of the grant-funded Project. Accordingly, no expenses under “Salaries, Wages, and Fringe Benefits” have been included in **Table 6.3**.

Travel

Local travel by Agency staff will be covered under the Agency’s operating budget. Accordingly, no expenses have been included under “Travel” in **Table 6.3**. Estimated travel expenses for the consultants selected for the Project are included in the “Contractual” line item.

Equipment

Equipment expenses have not been included in the budget because the Agency is not expected to purchase or lease any equipment as part of this Project. Any computers or other equipment necessary for development and application of the integrated model will be provided by the Agency. Accordingly, no “Equipment” expenses have been included in **Table 6.3**.

Materials and Supplies

The Project is for the development and application of a computer model. Acquisition of office supplies needed for the Project will be a general operating expense of the Agency that will take place outside of the grant agreement. Accordingly, no “Materials and Supplies” expenses have been included in **Table 6.3**.

Contractual

A consulting firm with expertise in development and application of integrated groundwater / surface water models will be selected to assist the Agency in execution of this Project. An RFP for this work will be prepared upon notification that the Agency has been awarded grant funding and will be released to the public upon completion of the grant agreement. Among the firms who have worked for the MWA in the past and are now being considered as candidates for performing this work are the following:

- GEI;
- Kennedy Jenks;
- Todd Groundwater;
- Geoscience Support Services;
- URS;
- RBF, and
- Brown and Caldwell.

Environmental and Regulatory Compliance Costs

The project proposed for funding will not result in any physical changes to the environment and therefore no environmental and regulatory compliance costs have been budgeted. Therefore, no costs for Environmental and Regulatory Compliance have been included in **Table 6.3**.

Other Expenses

All project expenses are included in the cost items described above. Therefore, no costs are associated with this budget category in **Table 6.3**.

Indirect Costs

No indirect costs are included in the budget. Accordingly, this category does not apply.

Total Costs

The estimated budget for the Project is presented in **Table 6.3**. As shown, the total budget for the Integrated Model Development and Alternatives Evaluation Project is estimated at **\$300,000**, with **\$150,000** in requested grant funds (Federal Cost Share) and **\$150,000** in Non-Federal Cost Share funds to be furnished by the MWA. The total Federal Cost Share requested is 50 percent of total Project costs with the remainder contributed by the Applicant.

6.4 Budget Form

Included at the beginning of this application (with the other Mandatory Federal Forms) is Form SF-424A for budget proposal purposes, specifically, “Non-Construction Programs” as specified by the FOA.

7. Environmental and Cultural Resources Compliance

The development and application of an integrated groundwater / surface water model as proposed in this grant application will not require environmental or cultural resources compliance through the National Environmental Policy Act (NEPA) or the California Environmental Quality Act (CEQA). As discussed in Section 5, the proposed model may be applied to support future environmental compliance efforts.

8. Required Permits and Approvals

The Agency will be responsible for securing any necessary permits and approvals. However, no permits or approvals are expected to be required for activities to be performed under this Project.

9. Letters of Support

Reclamation funds are being requested from the Applied Science Grant Program to assist the Mojave Water Agency in developing an integrated groundwater / surface water model to be used by the Agency to evaluate alternatives to improve conjunctive management of groundwater and surface water. These alternatives may include modifications to operation of the Mojave River Dam, formulation of long-term water banking programs and other activities intended to improve the security and reliability of water supplies to benefit users in the Agency's service area.

RESOLUTION NO. 1075-19

**A RESOLUTION OF THE BOARD OF DIRECTORS OF THE MOJAVE WATER
AGENCY AUTHORIZING AN APPLICATION FOR FUNDING ASSISTANCE
THROUGH THE BUREAU OF RECLAMATION'S
WATERSMART APPLIED SCIENCE GRANT PROGRAM TO SUPPORT BANKING
PROGRAMS**

WHEREAS, the United States Department of the Interior, Bureau of Reclamation ("Reclamation") has implemented the WaterSMART Program to provide financial assistance to water managers for projects that seek to conserve and use water more efficiently, increase the use of renewable energy and improve energy efficiency, benefit threatened and endangered species, investigate and develop water marketing strategies, prevent any water-related crisis, or otherwise contribute to water supply and sustainability in the Western United States;

WHEREAS, Reclamation has solicited proposals from states, Indian tribes, irrigation districts, water districts, and other organizations with water or power delivery authority for a new round of grant funding under the WaterSMART Program to support development of water marketing strategies that will help prevent water conflicts and will contribute to water supply sustainability, which proposals are due on or before October 30, 2019;

WHEREAS, the Board of Directors of the Mojave Water Agency ("Agency") has identified itself as an eligible applicant under Reclamation's WaterSMART Applied Science Grant Program, FOA No. BOR-DO-19-F012; and

WHEREAS, the Agency is pursuing grant funding assistance under the WaterSMART Program in an amount up to \$150,000 to develop a regional water marketing strategy.

NOW, THEREFORE, be it resolved by the Board of Directors as follows:

1. The Board has reviewed the scope and purpose of Agency's funding application, finds that the Project will serve both the needs of the Agency's ratepayers and satisfy the goals of the WaterSMART Program, and on that basis, supports staff's submittal of the financial assistance application to Reclamation.
2. The Agency is capable of funding the minimum 50-percent cost share required to obtain grant funding under the WaterSMART Applied Science Grant Program. Collaborating agencies will verify their funding capabilities through letters of commitment to be included with the application.
3. The Board hereby ratifies the action of its General Manager or his designee of the Agency in applying for financial assistance from Reclamation's WaterSMART Program as part of a regional collaborative effort and authorizes the General Manager

or his designee to execute any related documents, including a cooperative financial assistance agreement with Reclamation.

4. The General Manager and staff are directed to take all other actions necessary to secure funding for the Project under the WaterSMART Applied Science Grant Program, including working with Reclamation to meet established deadlines for entering into a cooperative financial assistance agreement.

PASSED AND ADOPTED by the Board of Directors of the Mojave Water Agency on the 24th day of October, 2019, by the following vote:

AYES:

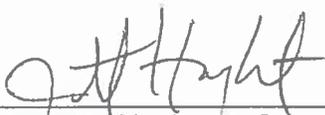
NOES:

ABSENT:



Carl Coleman, President

ATTEST:



Jeanette Hayhurst, Secretary

11. Unique Entity Identifier and System for Award Management

MWA is registered in the System for Award Management (SAM) and will maintain an active SAM registration during the period of any federal assistance agreement.

MWA's DUNS number is 1319366680000.

MWA is registered in the Automated System Application for Payment (ASAP) and will maintain an active ASAP account during the period of any federal assistance agreement.

⚠ ALERT: SAM.gov will be down for scheduled maintenance Saturday, 08/10/2019, from 8:00 AM to 1:00 PM (EDT).

⚠ ALERT: CAGE is currently experiencing a high volume of registrations, and is working them in the order in which they are received. When your registration is assigned to a CA Technician, you will be contacted by CAGE, if necessary, for any additional information.

Entity Dashboard

- ▶ [Entity Overview](#)
- ▶ [Entity Registration](#)

- ▶ [Core Data](#)
- ▶ [Assertions](#)
- ▶ [Reps & Certs](#)
- ▶ [POCs](#)
- ▶ [Reports](#)
- ▶ [Service Contract Report](#)
- ▶ [BioPreferred Report](#)

Mojave Water Agency
 DUNS: 131936668 CAGE Code: 5NU50
 Status: Active
 Expiration Date: 05/01/2020
 Purpose of Registration: Federal Assistance Awards Only

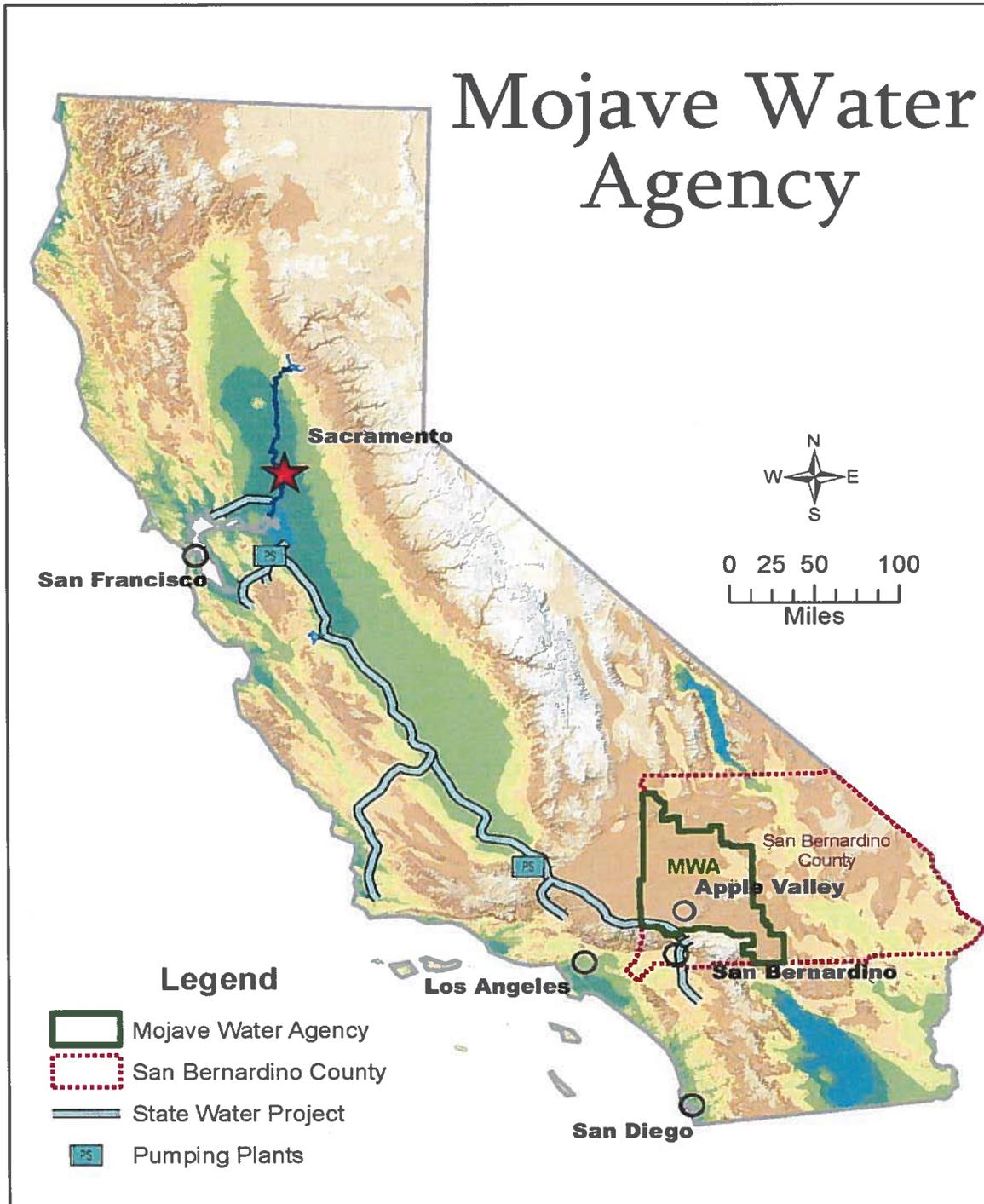
Entity Overview

Entity Registration Summary

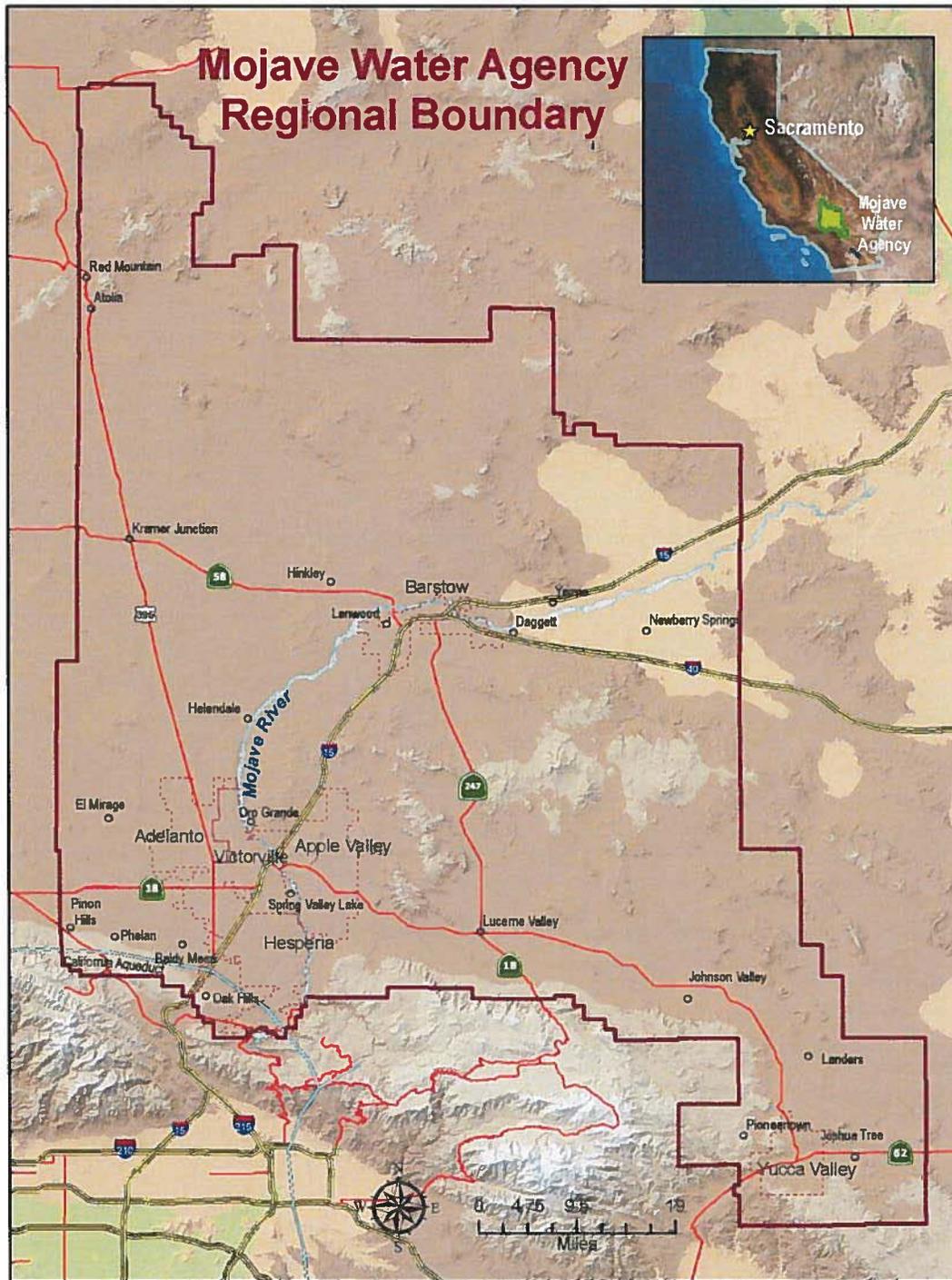
DUNS: 131936668
 Name: Mojave Water Agency
 Doing Business As: MWA
 Business Type: US Local Government
 Last Updated By: Darrell Reynolds
 Registration Status: Active
 Activation Date: 05/02/2019
 Expiration Date: 05/01/2020

Appendices

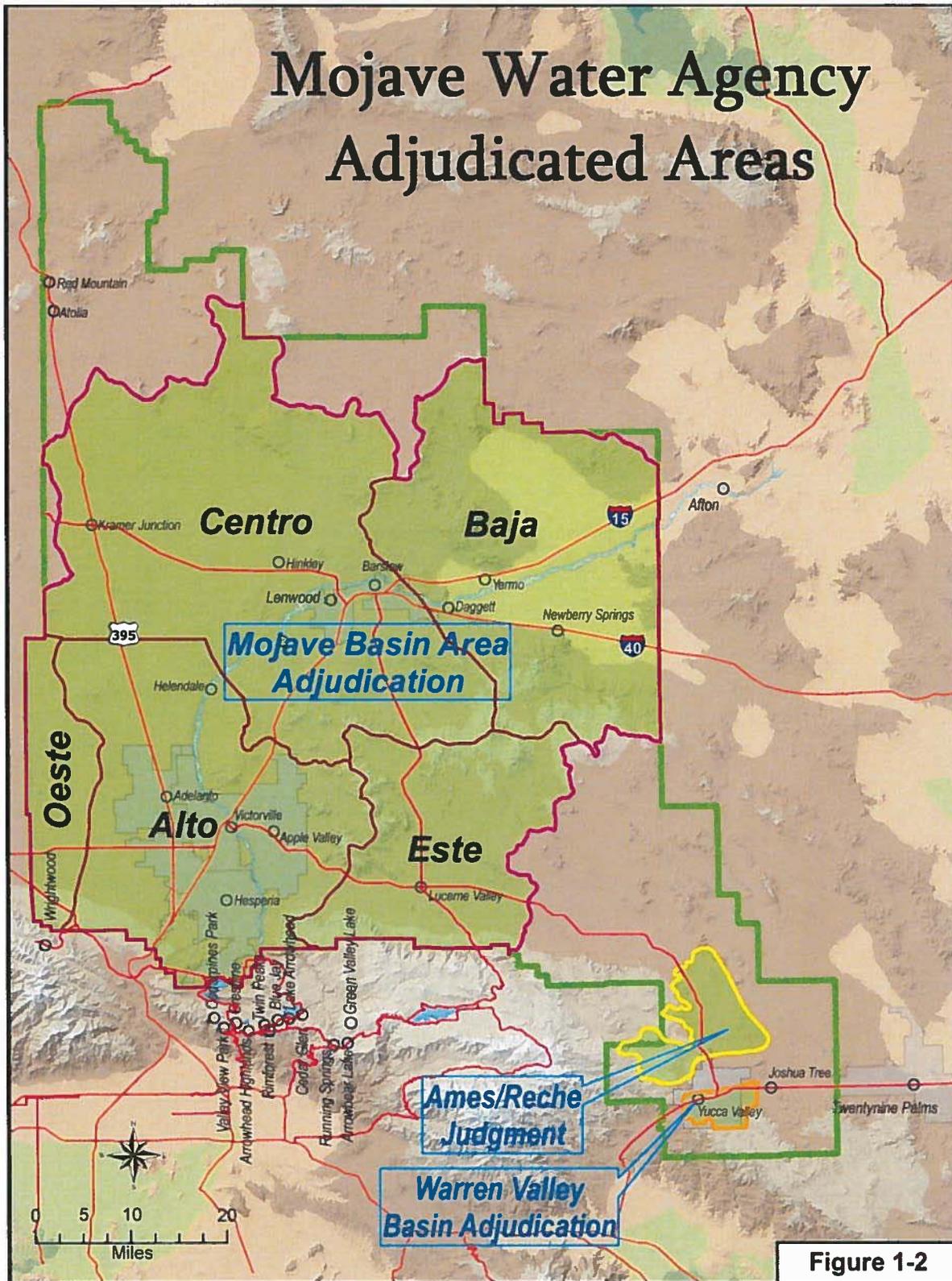
Appendix A – Maps and Schedule



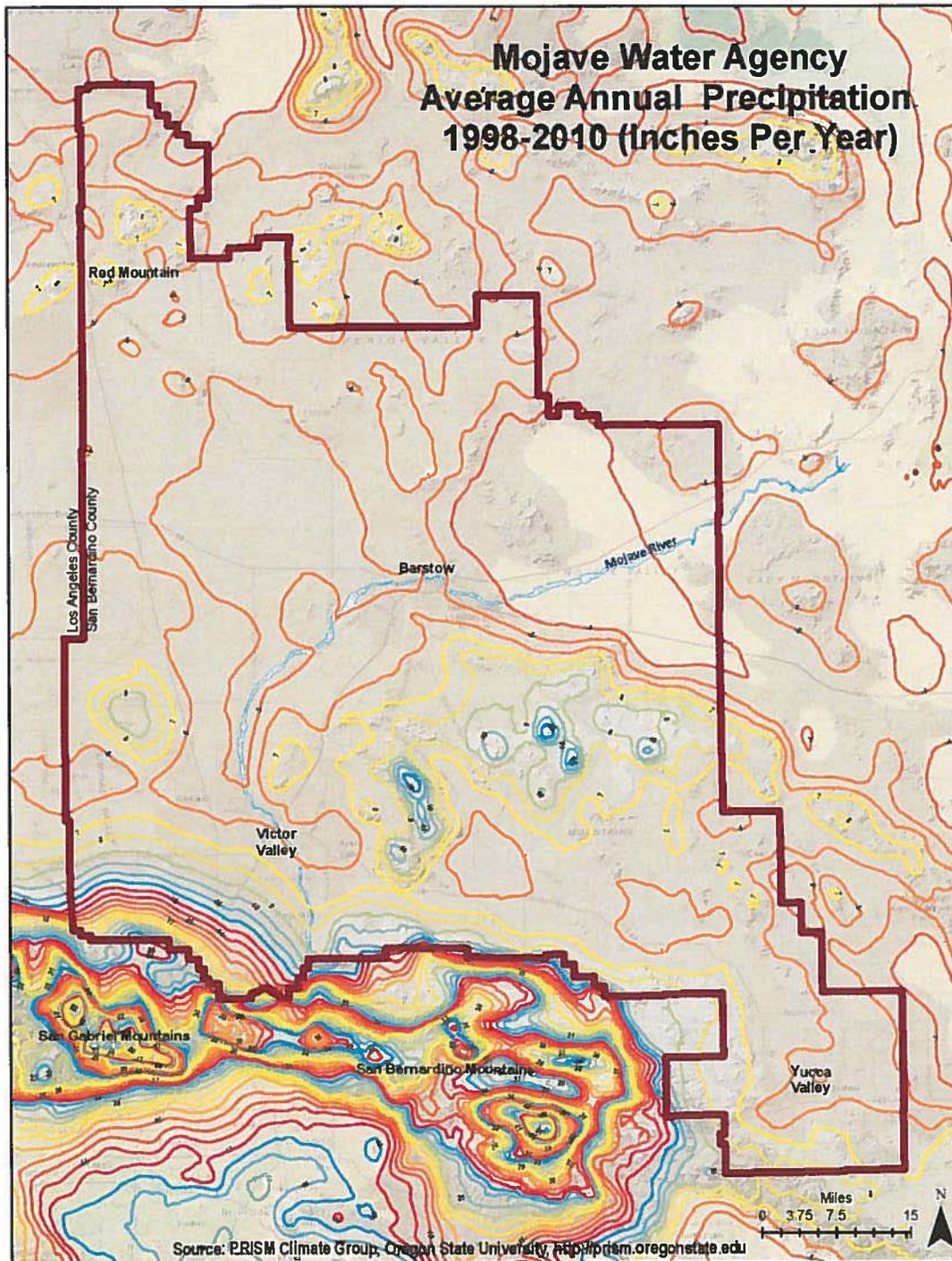
Appendix A - Figure 1. Project Location Map



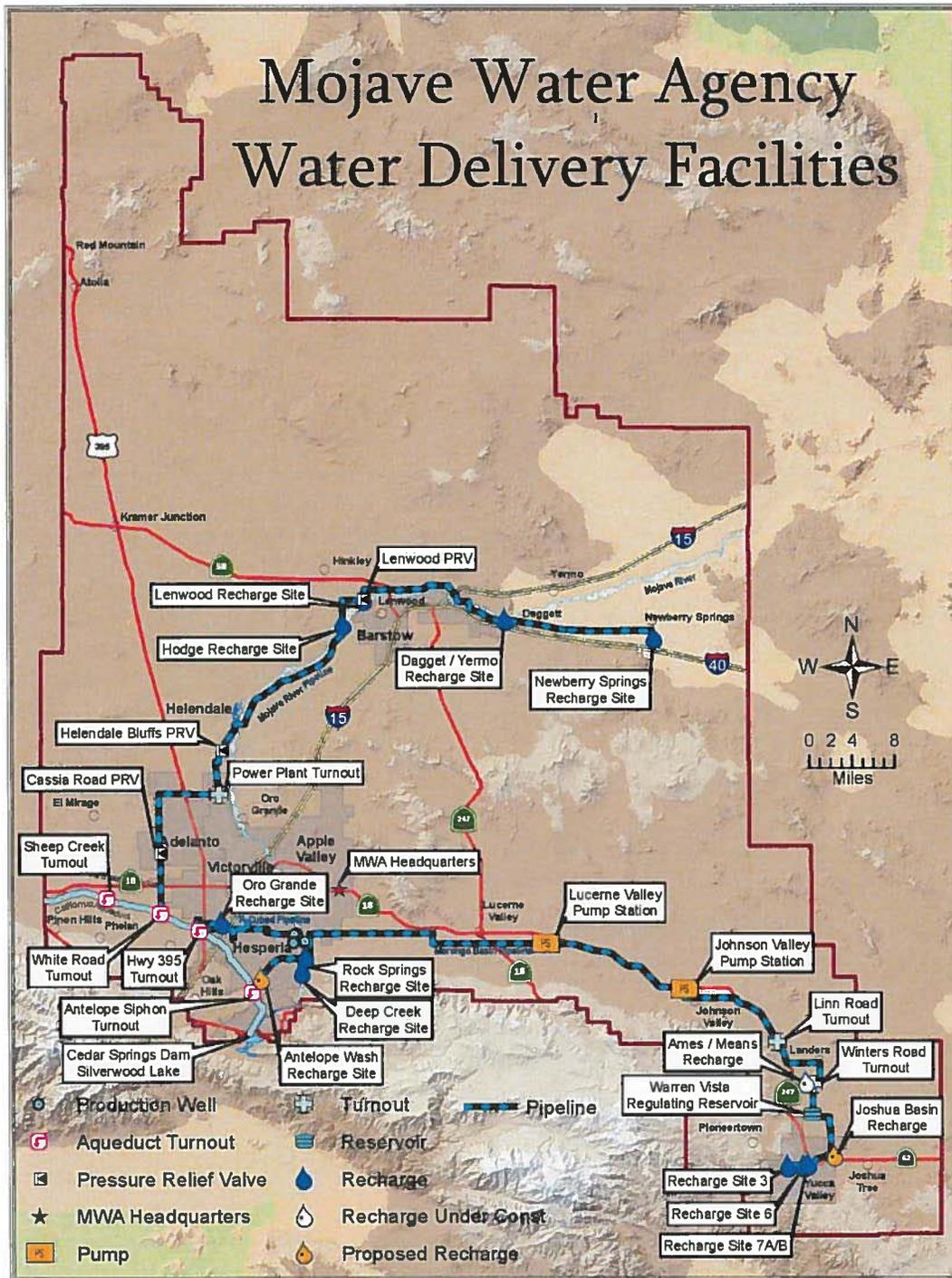
Appendix A - Figure 2. Boundaries of the Mojave Water Agency



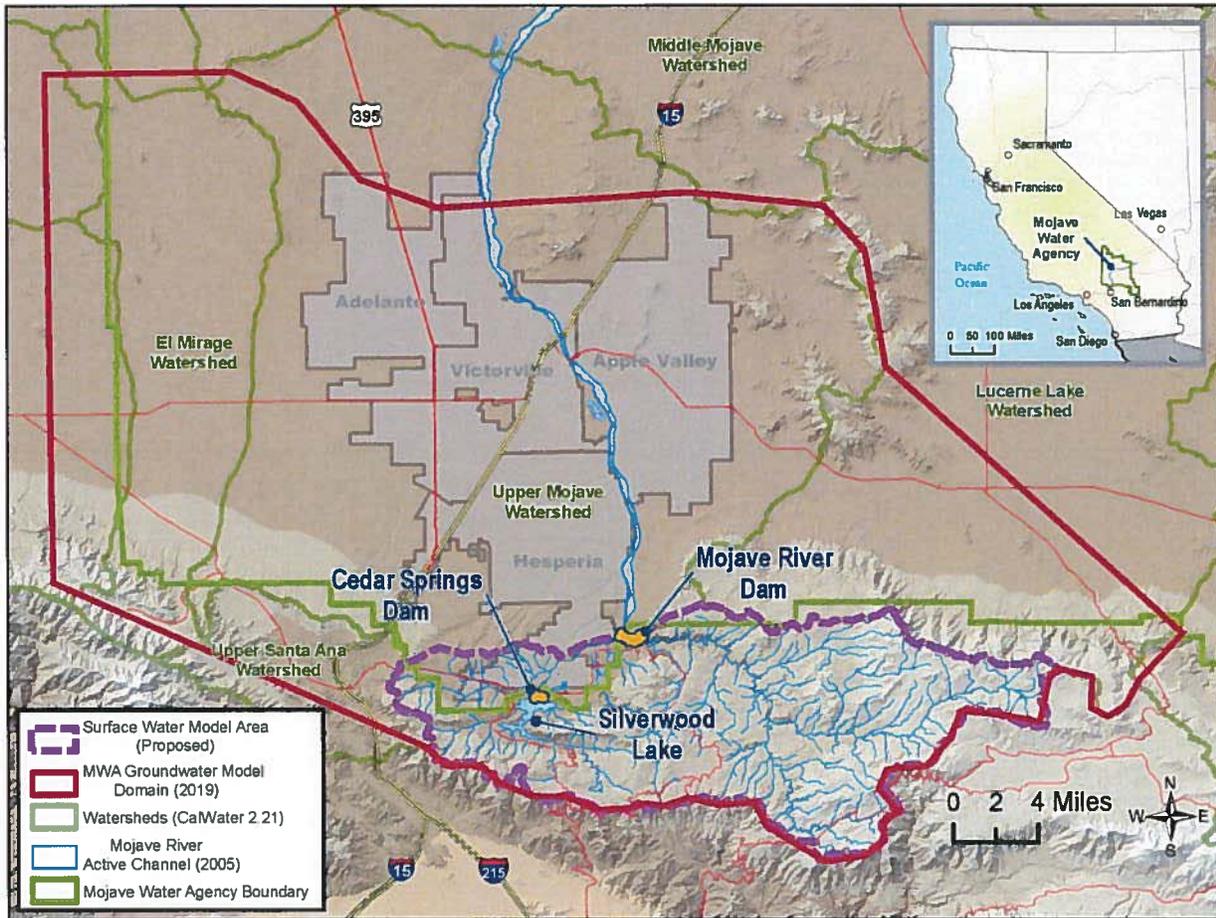
Appendix A - Figure 3. Adjudicated Areas



Appendix A - Figure 4. Average Annual Precipitation



Appendix A - Figure 5. Map of Major Infrastructure of the Mojave Water Agency



Appendix A - Figure 6. Domain of the Proposed Integrated Model

