



## STAFF REPORT

TO: Board of Directors  
THRU: Mark Foree, General Manager  
FROM: Laine Christman, Resource Economist  
Christian Kropf, Senior Hydrogeologist  
DATE: April 11, 2016  
SUBJECT: **Discussion and action on adoption of Resolution No. 239: A resolution to approve a grant proposal with the Bureau of Reclamation with respect to the Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency**

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### Recommendations:

Accept the grant application and provide an official resolution in support of the obligations associated with the U.S. Bureau of Reclamation's federal financial assistance requirements.

### Summary:

In April of 2016, TMWA prepared a proposal for federal funding through the U.S. Bureau of Reclamation's WaterSMART Drought Resiliency funding opportunity for FY 2016. The purpose of the grant is to fund a project that would equip three wells in Spanish Springs Valley with aquifer storage and recovery (ASR) capabilities. This proposed project is expected to: (1) immediately benefit the groundwater aquifer by replenishing water removed during drought years; (2) decrease nitrate concentrations observed at each production well; (3) provide more drought-storage and operational flexibility in the system as a whole; (4) support long-term planning efforts and drought-mitigation strategies of TMWA; and (5) move TMWA closer to its goal of having a more automated ASR program.

The proposal estimates a total cost of \$790,240 for the project. This estimate includes a request of \$300,000 in federal funding with the remainder to be borne by TMWA. Table 1 provides the total project costs and percent share, by source. A copy of the full proposal can be found in the Appendix of this report.

Table 1: Well Aquifer Storage and Recovery Retrofit Project Funding by Source

<b>Funding Sources</b>	<b>Percent of Total Project Cost</b>	<b>Total Cost by Source</b>
TMWA	62%	\$490,240
Reclamation	38%	\$300,000
<b>TOTALS</b>	<b>100%</b>	<b>\$790,240</b>

**Discussion:**

ASR is an effective method to increase the reliability and flexibility of water supply delivery. It does so by allowing for conjunctive use of surface and groundwater supplies. A groundwater well with ASR capabilities allows TMWA to inject treated surface water into the aquifer (when surface water is available for such use) for later extraction (when water demands peak). ASR is a cost-effective means to reverse the trend of declining water levels and replenish groundwater reserves. ASR can also improve the quality of water that has been impacted by natural and anthropogenic contaminants, such as nitrate and arsenic.

Spanish Springs Valley Basin (SSV) has been affected by both issues. First, SSV is over-appropriated, which has led to an overdraft situation in parts of the Basin. Second, nitrate and arsenic have been detected in groundwater above the maximum contaminant level (MCL) on the west side of the Basin. TMWA's 2016-2035 Water Resource Plan identifies retrofitting the existing wells within SSV as a prioritized project to enhance the supply and quality of groundwater in SSV (refer to Chapter 6 of the 2016-2035 Water Resource Plan for more details).

The proposed project will retrofit three of TMWA's groundwater production wells on the west side of SSV with ASR capabilities. These west side wells (Desert Springs 1, 2, & 3) have been impacted by high nitrate levels from septic systems and have only been used as a last resort during drought years. Consequently, wells on the east side of SSV, which are unaffected by contamination, are pumped longer at times to make up for the lost capacity from west side wells. Recharging the Desert Springs wells with surface water will force contaminated water away from the wells and provide in-situ dilution of contaminated native groundwater. This will allow the wells to be returned to service when needed most, thereby resting wells on the east side when possible. If the grant is awarded to TMWA, the project will utilize the requested federal funds to implement this well modification project to increase ASR capacity in SSV. TMWA currently has budgeted funds to rehabilitate these three wells, but not for ASR retrofit modifications. If federal funds are not secured, ASR retrofitting would need to be budgeted for a future date. If the ASR retrofitting is completed, TMWA will be closer to net-zero groundwater extraction in SSV. Overall, this project will enable TMWA to better serve its growing customer population in that area.

## Grant Application Package

<b>Opportunity Title:</b>	Drought Resiliency Project Grants for Fiscal Year 2016
<b>Offering Agency:</b>	Bureau of Reclamation
<b>CFDA Number:</b>	15.514
<b>CFDA Description:</b>	Reclamation States Emergency Drought Relief
<b>Opportunity Number:</b>	R16-FOA-DO-006
<b>Competition ID:</b>	R16-FOA-DO-006
<b>Opportunity Open Date:</b>	02/10/2016
<b>Opportunity Close Date:</b>	04/11/2016
<b>Agency Contact:</b>	Michael Dieterich Grants Management Specialist E-mail: mdieterich@usbr.gov Phone: 303-445-2484

**This opportunity is only open to organizations, applicants who are submitting grant applications on behalf of a company, state, local or tribal government, academia, or other type of organization.**

**Application Filing Name:** Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency

### Select Forms to Complete

**Mandatory**

<a href="#">Application for Federal Assistance (SF-424)</a>	<b>Complete</b>
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**Optional**

- |  |                 |
|--|-----------------|
| <input checked="" type="checkbox"/> <a href="#">Attachments</a>  | <b>Complete</b> |
| <input checked="" type="checkbox"/> <a href="#">Budget Information for Construction Programs (SF-424C)</a> | <b>Complete</b> |
| <input checked="" type="checkbox"/> <a href="#">Assurances for Construction Programs (SF-424D)</a>         | <b>Complete</b> |
| <input type="checkbox"/> <a href="#">Disclosure of Lobbying Activities (SF-LLL)</a>                        |                 |
| <input type="checkbox"/> <a href="#">Assurances for Non-Construction Programs (SF-424B)</a>                |                 |
| <input type="checkbox"/> <a href="#">Budget Information for Non-Construction Programs (SF-424A)</a>        |                 |

### Instructions

[Show Instructions >>](#)

This electronic grants application is intended to be used to apply for the specific Federal funding opportunity referenced here. If the Federal funding opportunity listed is not the opportunity for which you want to apply, close this application package by clicking on the "Cancel" button at the top of this screen. You will then need to locate the correct Federal funding opportunity, download its application and then apply.

<b>Application for Federal Assistance SF-424</b>		
* 1. Type of Submission: <input type="checkbox"/> Preapplication <input checked="" type="checkbox"/> Application <input type="checkbox"/> Changed/Corrected Application	* 2. Type of Application: <input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	* If Revision, select appropriate letter(s): <input type="text"/> * Other (Specify): <input type="text"/>
* 3. Date Received: <input type="text"/> Completed by Grants.gov upon submission.	4. Applicant Identifier: <input type="text"/>	
5a. Federal Entity Identifier: <input type="text"/>	5b. Federal Award Identifier: <input type="text"/>	
<b>State Use Only:</b>		
6. Date Received by State: <input type="text"/>	7. State Application Identifier: <input type="text"/>	
<b>8. APPLICANT INFORMATION:</b>		
* a. Legal Name: <input type="text"/> Truckee Meadows Water Authority		
* b. Employer/Taxpayer Identification Number (EIN/TIN): <input type="text"/> 88.0488450	* c. Organizational DUNS: <input type="text"/> 1044647680000	
<b>d. Address:</b>		
* Street1: <input type="text"/> 1355 Capital Blvd Street2: <input type="text"/> * City: <input type="text"/> Reno County/Parish: <input type="text"/> * State: <input type="text"/> NV: Nevada Province: <input type="text"/> * Country: <input type="text"/> USA: UNITED STATES * Zip / Postal Code: <input type="text"/> 89502-3013		
<b>e. Organizational Unit:</b>		
Department Name: <input type="text"/>	Division Name: <input type="text"/>	
<b>f. Name and contact information of person to be contacted on matters involving this application:</b>		
Prefix: <input type="text"/> Middle Name: <input type="text"/> * Last Name: <input type="text"/> Kropf Suffix: <input type="text"/>	* First Name: <input type="text"/> Christian	
Title: <input type="text"/> Senior Hydrogeologist		
Organizational Affiliation: <input type="text"/> Truckee Meadows Water Authority		
* Telephone Number: <input type="text"/> 775-834-8016	Fax Number: <input type="text"/>	
* Email: <input type="text"/> ckropf@tmwa.com		

**Application for Federal Assistance SF-424**

**\* 9. Type of Applicant 1: Select Applicant Type:**

B: County Government

Type of Applicant 2: Select Applicant Type:

Type of Applicant 3: Select Applicant Type:

\* Other (specify):

**\* 10. Name of Federal Agency:**

Bureau of Reclamation

**11. Catalog of Federal Domestic Assistance Number:**

15.514

CFDA Title:

Reclamation States Emergency Drought Relief

**\* 12. Funding Opportunity Number:**

R16-FOA-DO-006

\* Title:

Drought Resiliency Project Grants for Fiscal Year 2016

**13. Competition Identification Number:**

R16-FOA-DO-006

Title:

**14. Areas Affected by Project (Cities, Counties, States, etc.):**

Add Attachment

Delete Attachment

View Attachment

**\* 15. Descriptive Title of Applicant's Project:**

Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency

Attach supporting documents as specified in agency instructions.

Add Attachments

Delete Attachments

View Attachments

<b>Application for Federal Assistance SF-424</b>	
<b>16. Congressional Districts Of:</b>	
* a. Applicant <input type="text" value="NV-002"/>	* b. Program/Project <input type="text" value="NV-002"/>
Attach an additional list of Program/Project Congressional Districts if needed.	
<input type="text"/>	<input type="button" value="Add Attachment"/> <input type="button" value="Delete Attachment"/> <input type="button" value="View Attachment"/>
<b>17. Proposed Project:</b>	
* a. Start Date: <input type="text" value="10/01/2016"/>	* b. End Date: <input type="text" value="09/30/2018"/>
<b>18. Estimated Funding (\$):</b>	
* a. Federal	<input type="text" value="300,000.00"/>
* b. Applicant	<input type="text" value="490,240.00"/>
* c. State	<input type="text" value="0.00"/>
* d. Local	<input type="text" value="0.00"/>
* e. Other	<input type="text" value="0.00"/>
* f. Program Income	<input type="text" value="0.00"/>
* g. TOTAL	<input type="text" value="790,240.00"/>
<b>* 19. Is Application Subject to Review By State Under Executive Order 12372 Process?</b>	
<input type="checkbox"/> a. This application was made available to the State under the Executive Order 12372 Process for review on <input type="text"/> .	
<input checked="" type="checkbox"/> b. Program is subject to E.O. 12372 but has not been selected by the State for review.	
<input type="checkbox"/> c. Program is not covered by E.O. 12372.	
<b>* 20. Is the Applicant Delinquent On Any Federal Debt? (If "Yes," provide explanation in attachment.)</b>	
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	
If "Yes", provide explanation and attach	
<input type="text"/>	<input type="button" value="Add Attachment"/> <input type="button" value="Delete Attachment"/> <input type="button" value="View Attachment"/>
<b>21. *By signing this application, I certify (1) to the statements contained in the list of certifications** and (2) that the statements herein are true, complete and accurate to the best of my knowledge. I also provide the required assurances** and agree to comply with any resulting terms if I accept an award. I am aware that any false, fictitious, or fraudulent statements or claims may subject me to criminal, civil, or administrative penalties. (U.S. Code, Title 218, Section 1001)</b>	
<input checked="" type="checkbox"/> ** I AGREE	
** The list of certifications and assurances, or an internet site where you may obtain this list, is contained in the announcement or agency specific instructions.	
<b>Authorized Representative:</b>	
Prefix: <input type="text"/>	* First Name: <input type="text" value="Michele"/>
Middle Name: <input type="text"/>	
* Last Name: <input type="text" value="Sullivan"/>	
Suffix: <input type="text"/>	
* Title: <input type="text" value="Chief Financial Officer"/>	
* Telephone Number: <input type="text" value="775-834-8284"/>	Fax Number: <input type="text"/>
* Email: <input type="text" value="msullivan@tmwa.com"/>	
* Signature of Authorized Representative: <input type="text" value="Completed by Grants.gov upon submission."/>	* Date Signed: <input type="text" value="Completed by Grants.gov upon submission."/>

## ATTACHMENTS FORM

**Instructions:** On this form, you will attach the various files that make up your grant application. Please consult with the appropriate Agency Guidelines for more information about each needed file. Please remember that any files you attach must be in the document format and named as specified in the Guidelines.

**Important:** Please attach your files in the proper sequence. See the appropriate Agency Guidelines for details.

1) Please attach Attachment 1	<input type="text" value="01__TitlePage.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
2) Please attach Attachment 2	<input type="text" value="02__TableofContents.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
3) Please attach Attachment 3	<input type="text" value="03__Proposal_Narrative.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
4) Please attach Attachment 4	<input type="text" value="04__Environmental and Cultural"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
5) Please attach Attachment 5	<input type="text" value="05__FundingPlan.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
6) Please attach Attachment 6	<input type="text" value="06__Budget_Proposal.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
7) Please attach Attachment 7	<input type="text" value="07__Budget_Narrativepdf.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
8) Please attach Attachment 8	<input type="text" value="08__Permits.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
9) Please attach Attachment 9	<input type="text" value="09__2035WRP_select_sections.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
10) Please attach Attachment 10	<input type="text" value="PriceQuotes.pdf"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
11) Please attach Attachment 11	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
12) Please attach Attachment 12	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
13) Please attach Attachment 13	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
14) Please attach Attachment 14	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>
15) Please attach Attachment 15	<input type="text"/>	<input type="button" value="Add Attachment"/>	<input type="button" value="Delete Attachment"/>	<input type="button" value="View Attachment"/>

**BUDGET INFORMATION - Construction Programs**

NOTE: Certain Federal assistance programs require additional computations to arrive at the Federal share of project costs eligible for participation. If such is the case, you will be notified.

COST CLASSIFICATION	a. Total Cost	b. Costs Not Allowable for Participation	c. Total Allowable Costs (Columns a-b)
1. Administrative and legal expenses	\$	\$	\$
2. Land, structures, rights-of-way, appraisals, etc.	\$	\$	\$
3. Relocation expenses and payments	\$	\$	\$
4. Architectural and engineering fees	\$	\$	\$
5. Other architectural and engineering fees	\$	\$	\$
6. Project inspection fees	\$	\$	\$
7. Site work	\$	\$	\$
8. Demolition and removal	\$	\$	\$
9. Construction	\$ 790,240.00	\$	\$ 790,240.00
10. Equipment	\$	\$	\$
11. Miscellaneous	\$	\$	\$
12. SUBTOTAL (sum of lines 1-11)	\$ 790,240.00	\$	\$ 790,240.00
13. Contingencies	\$	\$	\$
14. SUBTOTAL	\$ 790,240.00	\$	\$ 790,240.00
15. Project (program) income	\$	\$	\$
16. TOTAL PROJECT COSTS (subtract #15 from #14)	\$ 790,240.00	\$	\$ 790,240.00
<b>FEDERAL FUNDING</b>			
17. Federal assistance requested, calculate as follows: (Consult Federal agency for Federal percentage share.) Enter the resulting Federal share.	Enter eligible costs from line 16c Multiply X <input type="text" value="38"/> %		\$ 300,291.20

## ASSURANCES - CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

**NOTE:** Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant:, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure non-discrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards of merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to non-discrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681 1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333) regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.

<p>SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL</p> <p>Completed on submission to Grants.gov</p>	<p>TITLE</p> <p>Chief Financial Officer</p>
<p>APPLICANT ORGANIZATION</p> <p>Truckee Meadows Water Authority</p>	<p>DATE SUBMITTED</p> <p>Completed on submission to Grants.gov</p>

SF-424D (Rev. 7-97) Back

**Title:** Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency

**Applicant:** Truckee Meadows Water Authority

**Project Manager:** Christian Kropf (Senior Hydrogeologist)  
Truckee Meadows Water Authority  
1355 Capital Blvd.  
Reno, NV 89502  
Email: [ckropf@tmwa.com](mailto:ckropf@tmwa.com)  
Office: (775) 834-8016, Fax: (775) 834-8003

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**Date:** 4/8/2016  
**Proposal Title:** **Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency**  
**Applicant:** Truckee Meadows Water Authority  
1355 Capital Blvd  
Reno, NV 89502  
  
**Project Location:** City of Reno, Washoe County, Nevada  
**Project Located on a Federal Facility?** No  
**Start/End Date:** October 1, 2016 / September 30, 2018  
**Project Length:** 2 years

### **Executive Summary**

Aquifer Storage and Recovery (ASR) is an effective method to increase the reliability and flexibility of water supply delivery. It does so by allowing for conjunctive use of surface and groundwater supplies. A groundwater well with ASR capabilities allows for treated surface water to be injected into the underground aquifer (when surface water is available for such use) for later extraction (when water demands peak). ASR is a cost-effective means to reverse the trend of declining water levels and replenish groundwater reserves. ASR can also improve the quality of water that has been impacted by natural and anthropogenic contaminants, such as nitrate and arsenic. For this proposed project, Truckee Meadows Water Authority (TMWA) proposes to retrofit three groundwater production wells on the west side of Spanish Springs SSV (SSV) to ASR wells, so it can better manage surface water and groundwater supplies in the basin conjunctively, in order to be more drought resilient. Moreover, the ASR will help replenish groundwater which has been over-drawn for many decades. Finally, the proposed project will help to improve water quality in SSV, as these west side wells (Desert Springs 1, 2, & 3 wells) have been impacted by high nitrate levels from septic systems and are only used a last resort during periods of drought. Consequently, wells on the east side of the SSV, which are unaffected by such contamination, have been over-drawn to make up for the resulting loss in capacity in the west side wells. Recharging the Desert Springs wells with surface water will force contaminated water away from the wells and dilute contamination in-situ, thereby allowing the wells to be returned to service when needed most and resting wells on the east side when possible. The project will utilize the requested funds to implement the well modification projects necessary to increase ASR capacity in the SSV to better serve the 16,000 customers.

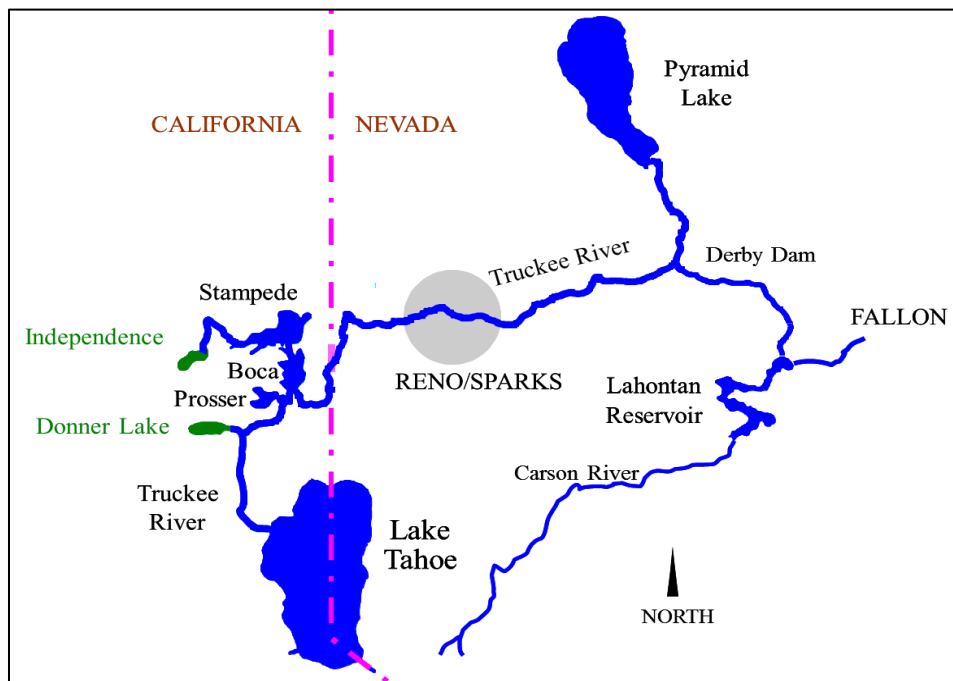
Construction activities associated with this proposed project include modifying existing well house piping to allow for recharge, removing the existing pumps and motors, rehabilitating the wells to increase efficiency and capacity, modifying the pump columns with variable flow ASR valves, installing telemetry (SCADA) control systems, and restoring the area to its original condition. This proposed project is expected to: (1) immediately benefit the groundwater aquifer by replenishing water removed during drought years; (2) decrease nitrate concentrations observed at each production well; (3) provide more drought-storage and operational flexibility in the system as a whole, (4) support long-term planning efforts and drought-mitigation strategies of TMWA; and (5) move TMWA closer to its goal of having a more automated ASR program.

## Background

### *Truckee River Basin*

Originating in Lake Tahoe, California, the Truckee River flows from the northern Sierra Nevada into the Truckee Meadows and terminates in Pyramid Lake. Figure 1 provides an overview of the Truckee River system in its entirety. The river is the primary water source for the Truckee Meadows communities of Reno-Sparks, Fernley, and Fallon. Additional stakeholders for the river's water resources include commercial interests in the largest industrial park in the U.S. located on the outskirts of Sparks, agricultural producers and livestock grazers in the region, and the Pyramid Lake Paiute Tribe. The river's terminus, Pyramid Lake, is home to endangered (Cui-ui) and special status (Lahontan Cutthroat Trout) species of fish. Given its many competing stakeholders and uses, the Truckee River has been one of the most litigated rivers in the U.S., and over the last century of litigation, the water rights in the Truckee have become fully appropriated.

**Figure 1: Truckee River Basin system**



Similar to other communities in the western U.S., the Truckee Meadows region continues to be gripped by persistent drought. The Truckee Meadows is characterized as an arid, high desert region that depends on snow-fed water resources. On a year-to-year basis, these resources are highly variable in terms of overall quantity and form of precipitation (rainfall versus snowpack). Analysis of historical climate records and current weather trends within the Truckee River Basin indicate extreme weather events such as drought will worsen in the foreseeable future (Dettinger and Cayan 1995; Regonda et al. 2005; Cayan et al. 2008). This increased variability creates significant challenges for water sustainability planning, pushing conservation and efficiency to the forefront of water resource management in the area.

### *Truckee Meadows Water Authority*

TMWA is the main purveyor that meets the demands of municipal and irrigation water service within the Truckee Meadows Service Area (TMSA). TMWA is chartered with the responsibility of managing the water resources within the TMSA. TMWA's primary supply of water resources is captured from the Truckee River, which it delivers to approximately 120,000 service connections, including residential, commercial, irrigation, fire protection, and wholesale customers. In conjunction with surface water, TMWA utilizes up to 90 groundwater production wells to meet peak time demand during the irrigation season (approximately May through September). In 2015, the total amount of water supplied to customers within the TMSA was approximately 83,000 acre feet (or 27 billion gallons). Figure 2 provides the TMSA boundaries, locations of traditional wells, ASR wells, and the three wells targeted for retrofit under this proposed project. TMWA currently has 27 groundwater wells permitted for ASR across the TMSA and recharges groundwater aquifers with treated surface water in the off-peak months. However, SSV does not yet have adequate ASR capabilities.

### *TMWA's Relationship with Bureau of Reclamation*

TMWA is currently engaged in a project with Reclamation funding titled: "Developing a Dynamic Drought Contingency Support Management System that Accounts for Information on Climate Change and Institutional Constraints." This project aims to update TMWA's Drought Contingency Plan and is scheduled for completion by July 2017. If funded, this proposed project would complement the existing Drought Contingency grant by enhancing TMWA's groundwater resources.

### *Historic Drought Conditions and Planning*

The water supply for the region is primarily spring runoff from the preceding winter's snowpack. TMWA uses this spring runoff, via Truckee River flows, to meet the majority of customer demands. According to historical records, the Truckee River Basin's annual snowpack and resulting river flows have always been variable. Figure 3 provides a historical record of precipitation in the Truckee River Basin with the yellow horizontal line depicting the average flow over the past century. Prolonged periods of drought that last up to eight years are not uncommon within the TMSA (e.g., 1987 to 1994 drought). Due to this variability in surface water flows, TMWA operates under a conjunctive management approach, i.e., it utilizes a combination of surface water and groundwater to meet customer demands that occur during the summer-time irrigation season.

Lake Tahoe captures the majority of the snowpack as it melts. The level of stored water in Lake Tahoe is directly affected by the variability in annual precipitation, making the elevation of Lake Tahoe a key indicator of the severity of drought cycles. Currently, the TMSA is experiencing persistent drought conditions. The past four years (2012 to 2015) have *exceeded* the previous worst dry cycle on record, and 2015 was exceptionally bad with the lowest snowpack on record. The result of this low snowpack has been consistently below-average flows in the Truckee River (Figure 4). While Lake Tahoe serves as a key indicator of drought, the lake also serves as the largest storage reservoir for the Truckee Meadows area. TMWA also stores surface water in a series of federally-operated reservoirs within the Truckee River watershed. This Privately Owned Surface Water (POSW) is utilized during times when irrigation demands

are such that the combination of natural river flows and groundwater are not enough to meet peak demands (i.e., during Drought Situations).

**Figure 2: Truckee Meadows Water Authority's Service Area in Washoe County, Nevada**

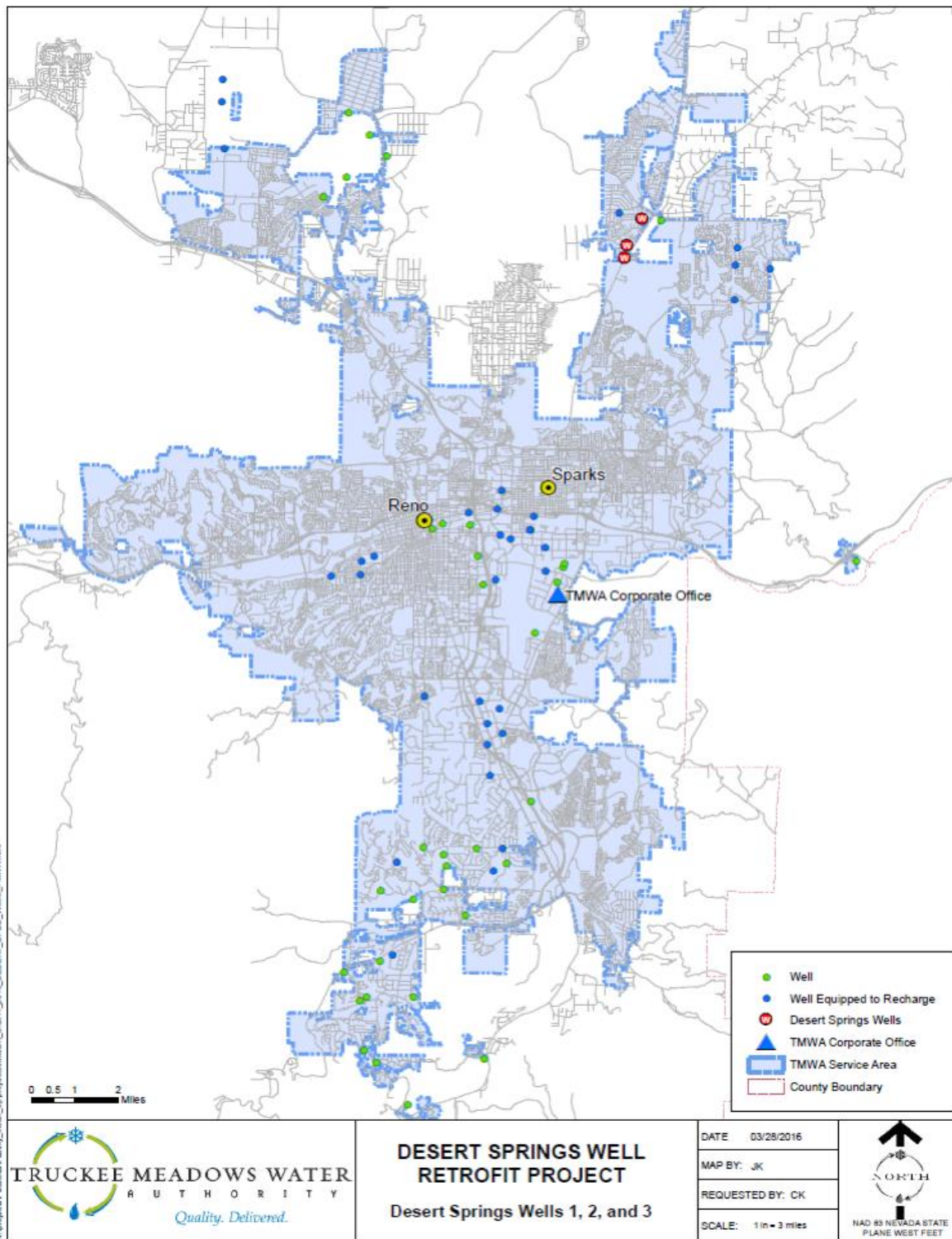


Figure 3: Annual snowpack vs. river flow in the Truckee River Basin, 1910 - 2015

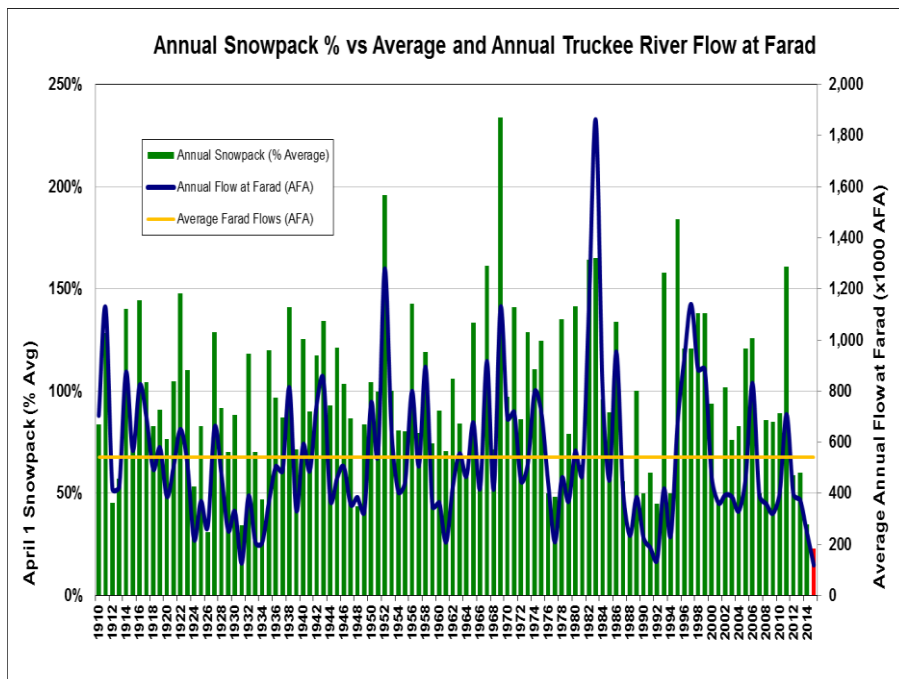
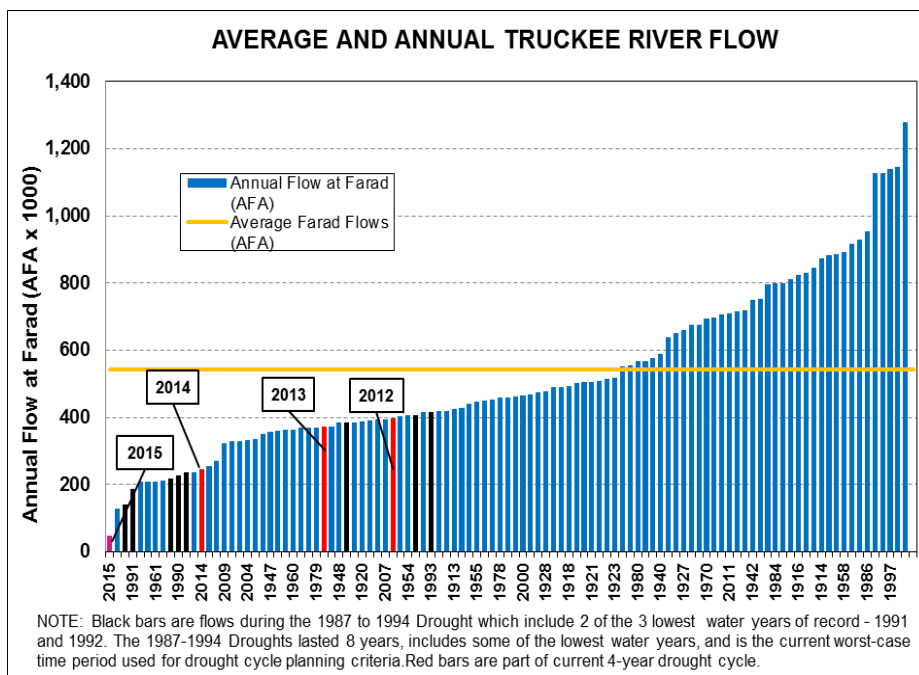


Figure 4: Average and annual Truckee River flow, 1997-2015



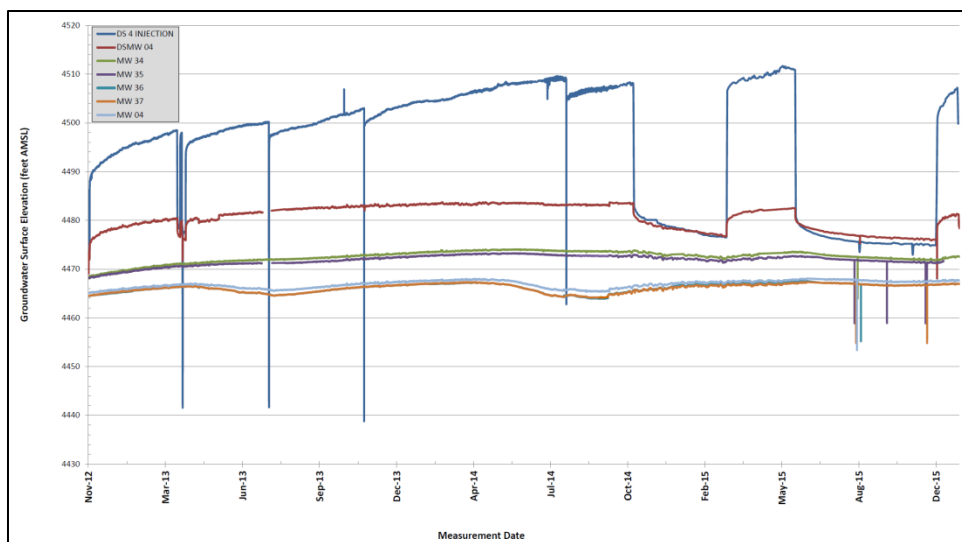
As the economic conditions continue to improve in the Truckee Meadows region, demands for water are expected to increase. Moreover, as stated previously, regional climate projections suggest increased volatility in future water supplies for the TMSA. Given the unpredictable nature of the area’s water supply over time and increasing demand requirements anticipated by additional service connections, a flexible conjunctive use program with ASR at its

core is essential toward ensuring reliability and drought resilience while managing unpredictable sources of supply. TMWA’s ASR Program has been successfully implemented at its core wells at the center of the distribution system and has actively expanding ASR into the outlying areas of the TMSA to increase supply flexibility.

**Technical Project Description**

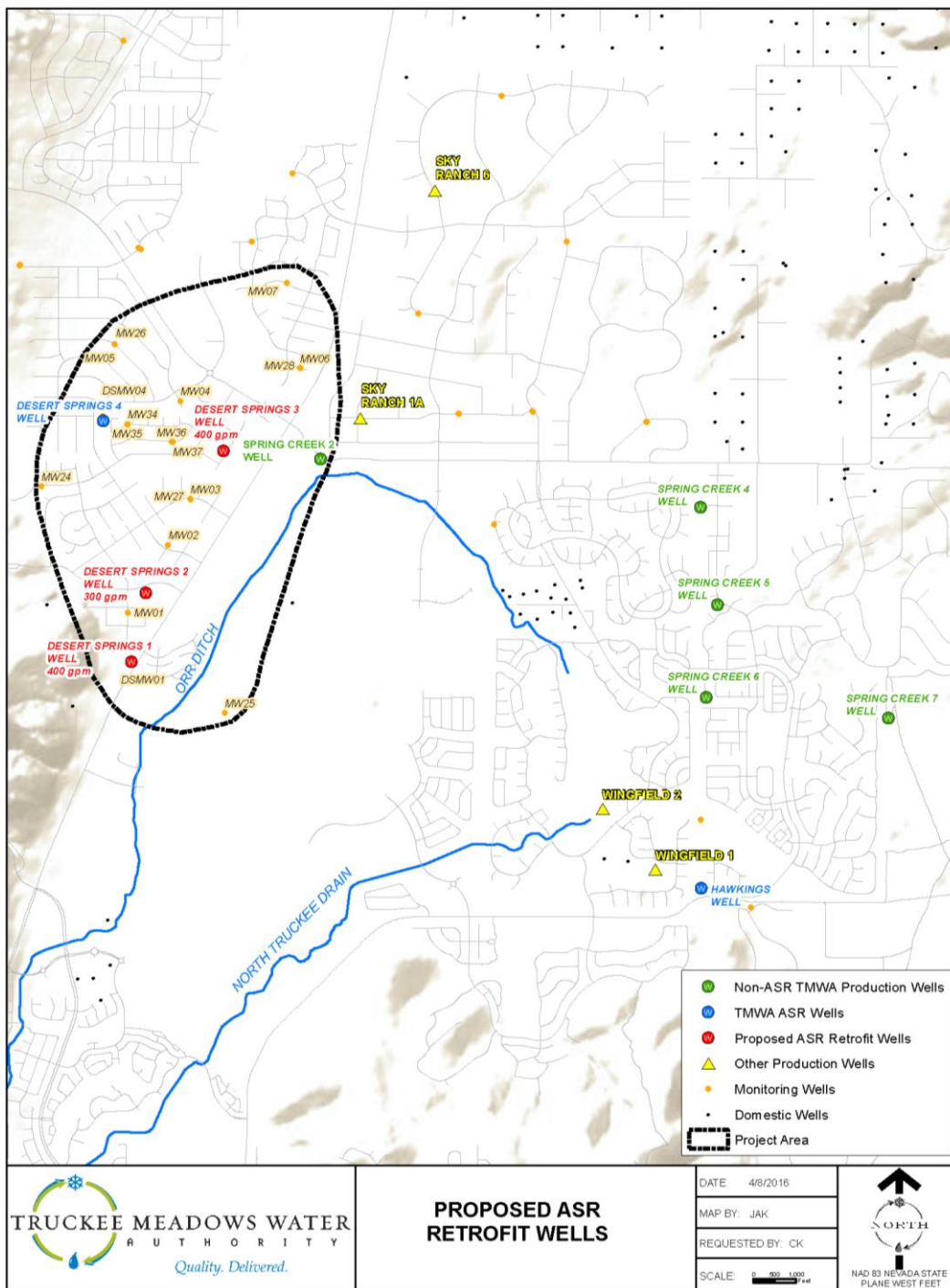
SSV, located at the northeastern extent of the TMSA, is an area that has undergone significant population growth and increasing demands on water supplies in that basin over the past 15 years. This rapid growth has led to increased reliance on groundwater and declining water levels over time. TMWA has successfully reversed that trend in two wells it recharges in the basin. Figure 5 depicts the recharge at the Desert Springs 4 well and the sustained rebound of water levels in the area. The remaining wells on the west side of the basin (Desert Springs 1, 2, & 3) cannot be recharged without significant wellhead modifications and new conveyance system components due to their age and type of pump (submersible). New developments in water conveyance technologies now make it possible to recharge these three wells that have submersible pumps.

*Figure 5: Water level response to recharge activities at Desert Springs 4 well*



For this proposed project, TMWA will retrofit Desert Springs 1, 2, & 3 wells on the west side of the SSV for use as ASR wells. Figure 6 depicts TMWA’s municipal wells and two successful recharge well locations in SSV. This project will increase the recharge capacity and drought storage in the aquifer, accurately monitor and operate recharge at each well remotely, help bring the basin back into balance with respect to recharge and extraction, and help to remediate nitrate-contaminated groundwater in the area. Given these projected outcomes, this proposed project will meet the goals listed under R16-FOA-DO-006 Task A – Increasing the Reliability of Water Supplies through Infrastructure Improvements and Task B – Projects to Improve Water Management through Decision Support Tools, Modeling, and Measurement.

Figure 6: Project location map depicting existing and proposed ASR wells .

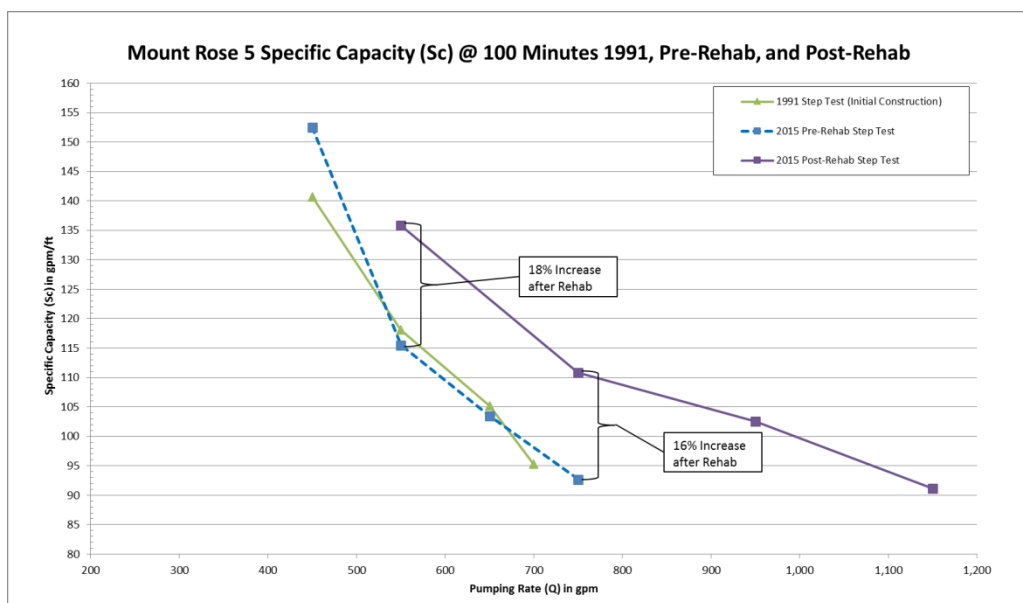


The three wells slated for rehabilitation and ASR retrofit are currently unequipped for ASR due to the nature of the original design and construction of the wells. These wells have downhole submersible pumps and motors with check-valves which prevent water from being recharged down through the pump column. These wells also have small annular spaces which include additional down-hole appurtenances that make the use of a separate recharge supply line unlikely due to lack of space. A novel method to retrofit these wells which were once unlikely to

be recharged includes installation of an inline downhole variable control flow valve which allows water to be directed down the pump column, thereby doing away with the need for a separate recharge supply line.

The first step in the retrofit process will be well rehabilitation. TMWA has a successful well rehabilitation program whereby wells of various ages and declining efficiencies are tested, brushed, bailed, developed, and treated with acid (if necessary) in order to increase the efficiency of the wells. TMWA has successfully returned wells to 100% or more of their original (as-constructed) efficiency, which reduces energy consumption, drawdown, and well interference. Under this project, TMWA will rehabilitate these three aging wells to not only improve the pumping efficiency, but also to improve the recharge efficiency of the wells. An example of efficiency gains after rehabilitation of a TMWA well is presented in Figure 7.

**Figure 7: Efficiency gains at a TMWA production well after successful rehabilitation**



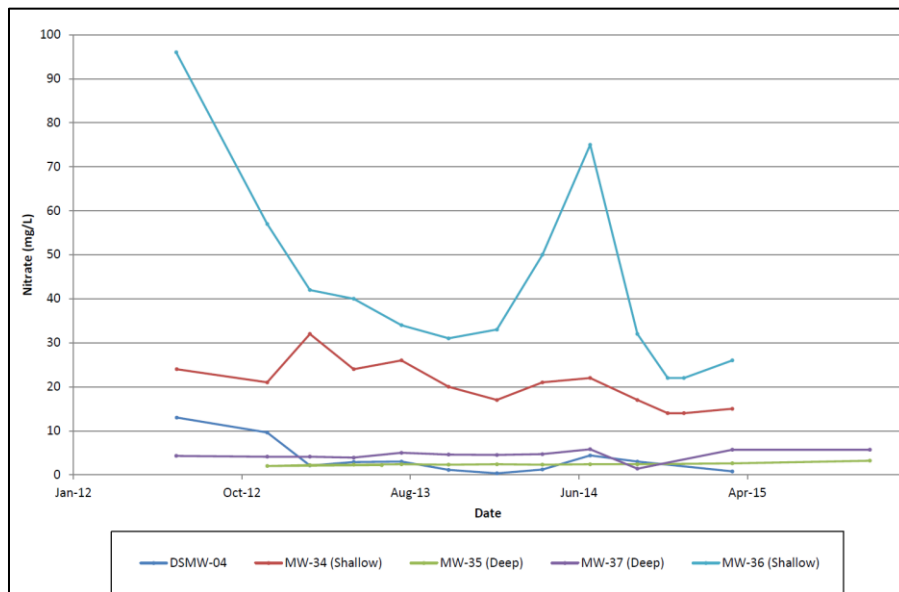
Once rehabilitated, the wells will undergo modifications to the wellhead piping and above-ground appurtenances critical to the delivery of drought storage water into the subsurface. Modifications will include high tech metering and control valves to monitor and track recharge water deliveries and water level response via a SCADA (Supervisory Control and Data Acquisition) system. These modifications will allow the wells to be recharged remotely, thereby greatly reducing onsite management of this satellite system.

After increasing the recharge efficiency and improving the recharge delivery and measurement systems, the downhole control valve will be installed when the pump and motor are reinstalled. The BASKI Inflex™ Flow Control Valve (FCV™) will be installed and connected to the SCADA control system to allow for remote activation and control of downhole recharge rates, which may vary seasonally and may necessitate variability depending on water level response and regional water resource needs.

All systems will be tested and approved before going online. Once online, recharge tests will confirm potential recharge rates and flows will be adjusted accordingly. A series of

groundwater monitoring wells will be used to measure the aquifer response in terms of water levels and water quality. It is anticipated that the project will increase the long-term viability of the wells by pushing nitrate-contaminated groundwater away from the production wells and reducing contaminant concentrations at the fringe of the recharge extent. Recharge at nearby Desert Springs 4 has resulted in reductions in nitrate in nearby groundwater monitoring wells. Figure 8 depicts concentrations of nitrate in groundwater since recharge began.

**Figure 8: Reduction in nitrate concentrations over time near the Desert Springs 4 recharge well**



Groundwater levels and water quality will be monitored from a network of monitoring wells to evaluate the benefit to the aquifer from recharge activities at the three proposed wells. Eighteen months of monitoring will help ensure the efficacy of the project to 1) replenish groundwater in the areas receiving recharge water, 2) ensure that groundwater quality is not diminished by recharge activities, and 3) look for possible reductions in nitrate concentrations. If funded, the project will have immediate benefits to the aquifer and may delay the need for a new well in the area.

**Evaluation Criteria A**

***Will the project make additional supplies available and how was this estimate calculated?***

Yes, the project will allow for storage of approximately 600 acre feet (AF)/year of additional water which will be available for drought supply, if needed. The estimate was based on 6 months of recharge at 300, 220, and 300 gpm for the three wells (750 gal/min x 1,440 min/day x 180 days x 325,851 gal/AF = 600 AF/year).

***What percentage of the total water supply does the additional water supply represent?***

TMWA pumped approximately 1,780 AF from the groundwater system in SSV in 2015. Recharging 600 AF of surface water accounts for approximately 34% of the total water pumped from SSV in 2015. The recharged water will remain in SSV for future use during drought years.

***Provide a brief qualitative description of the degree/significance of the benefits associated with the additional water supplies.***

The groundwater system in SSV is over-appropriated, meaning that the water rights available for use far outnumber the actual water available for extraction from the aquifer (based on perennial yield estimates from the USGS and the Nevada Division of Water Resources). Adding an additional 600 AF of recharge water for storage into the aquifer with this project, in addition to the roughly 1,110 AF (2016 estimates) recharged in SSV at Desert Springs 4 and Hawkings wells, will lessen the effects that over-appropriation has had on SSV. Recharge will account for approximately 96% of the water that TMWA pumps from SSV; 1,710 ASR potential versus 1,782 pumped (2015 data).

***How will the project build long-term resilience to drought? How many years will the project continue to provide benefits?***

As stated above, this additional recharge water will bring SSV closer into balance, leaving much needed groundwater drought reserves in the aquifer for future use. The modifications and improvements made to these three wells will allow for recharge to continue for the life of the well, projected to be another ten to twenty years.

***How will the project improve the management of water supplies? For example, will the project increase efficiency or increase operational flexibility?***

Wellhead and downhole modifications of the wells will improve the management of water supplies by allowing more surface water to be stored underground when it is plentiful and relying on that stored water during drought years. Rehabilitation will increase the efficiency of the wells by reducing groundwater pumping levels and energy required for production. The rehabilitation efforts will allow the wells to more readily accept recharge water more efficiently, thereby increasing the volume of water stored over a given timeframe.

***Will the project make new information available to water managers? If so, what is that information and how will it improve water management?***

The proposed SCADA improvements will allow TMWA to monitor and regulate the volume and rate of water recharged to maximize the amount of water stored in the aquifer. Given the remote location of the wells, real-time operational control will save time and money in an operational sense and may increase the amount of water stored through real-time adjustments.

***Will the project have benefits to fish, wildlife, or the environment? If so, please describe those benefits.***

Groundwater on the west side of SSV has been impacted by high concentrations of nitrate due to high-density septic systems in the area. Recharging the proposed wells will allow groundwater quality in the vicinity of the wells to recover and allow for a higher quality of water to be delivered to customers and may eliminate the need for energy-intensive treatment options necessary for nitrate removal.

***What is the estimated quantity of water that will be better managed as a result of this project? How was this estimate calculated?***

In addition to the 600 AF of water recharged now being made available, there is the potential benefit of an additional 48 AF of existing contaminated water being diluted by recharge activities at the Desert Springs 3 well and made available for supply. Estimating 20% of recharge water diluting enough contaminated groundwater near Desert Springs 3, where concentrations are above the MCL of 10 mg/L, to make it potable. The estimate was based on  $240 \text{ AF (recharged at DS3)} \times 20\% = 48 \text{ AF}$

***What percentage of the total water supply does the water better managed represent? How was this estimate calculated?***

Water recharged through this project (600 AF) accounts for approximately 34% of all the water TMWA pumps from SSV on an annual basis.

***Provide a brief qualitative description of the degree/significance of anticipated water management benefits.***

Storing more water underground, where evaporative losses are reduced to almost zero, allows TMWA to more efficiently utilize water that is available during wet years and wet months. This stored water will offset the withdrawals from already stressed aquifers in SSV, allowing groundwater in the basin to recover during wet years so it can be relied on when needed, during drought years. This additional water will bring TMWA’s net pumped versus recharged water in SSV to almost zero, further helping to bring the basin into balance.

***Recharge Well Description***

The wells are between 26 and 53 years old. Table 1 below provides a description of the well construction and associated pumping rate for each of the proposed ASR retrofit wells.

***Table 1: ASR well construction specifications***

Well	Build Date	Depth (feet)	Diameter (inches)	Specific Capacity (gpm/ft)	Screened Intervals (ft bls)	Depth to Water (ft bls)	Pumping Rate (gpm)
Desert Springs 1	1990	200	8	15	122-192	62	370
Desert Springs 2	1963	445	16	9	238-360	67	425
Desert Springs 3	1979	272	10	39	58-267	34	750

***Aquifer Description and Estimated Aquifer Response***

The following description of the aquifer near Desert Springs 1, 2, and 3 was taken from the report titled, “Spanish Springs Valley Analysis of Aquifer and Water Well Response (Meador, 1980) which assessed the aquifer penetrated by the Desert Springs 3 well. “While the valley is surrounded by hills and mountains dominated by igneous rocks, both intrusive and extrusive, the valley proper is occupied by geologically recent alluvium. This alluvium, as it is exposed at the surface and penetrated by drill holes below the surface, is dominated by sand and gravel formations interbedded with clay and clay-silts strata. Driller’s logs and electrical resistivity logs in the immediate area of this study illustrate the lenticular nature of all these recent sedimentary formations. It is particularly noticeable that the clay and clay-silt formations thicken toward the center of the valley, while the sand and gravel members dominate in the edges and near the foothills” and “All of this seems to illustrate that at various periods during the recent geologic past, this area...was largely occupied by lake waters.”

The Spanish Springs Basin summary report from the TMWA’s 2035 Water Resource Plan (2035 WRP) is attached to this proposal to help understand SSV’s water resources, challenges, and potential solutions (of which this project is a critical component). Table 2 describes the estimated ASR parameters at the proposed ASR wells.

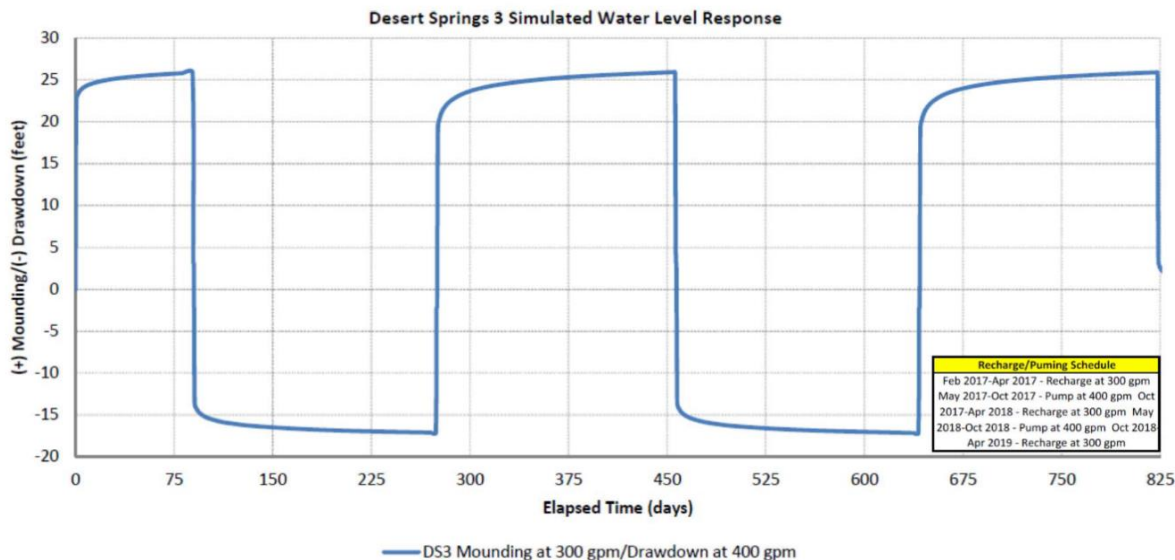
**Table 2: Estimated ASR parameters for each of the proposed wells**

Well	Estimated Recharge (gpm)	Max Recharge (gpm)	Depth to Water (ft bls)	Estimated Recharge Volume (AF/yr)	Estimated Extraction Volume* (AF/yr)
Desert Springs 1	250	400	62	200	250
Desert Springs 2	200	300	67	160	225
Desert Springs 3	300	400	34	240	220

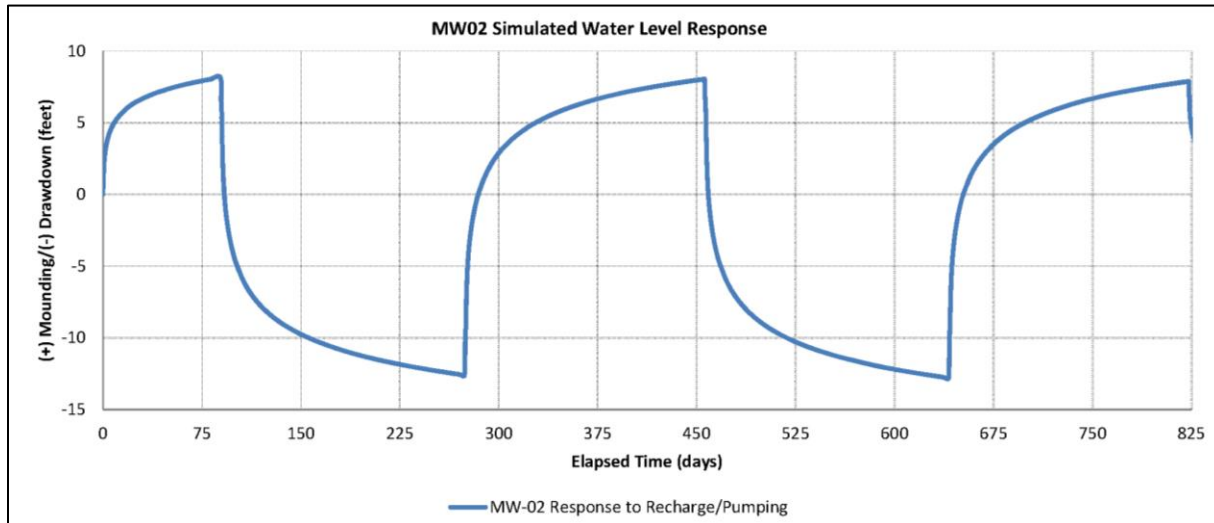
\*Based on highest extraction volume from the past 5 years.

Simulations have been completed to estimate the water level response at each proposed recharge well. As an example of one of those simulations, Figure 9 below indicates that the estimated recharge rates and annual recharge volumes will benefit water levels in the area. Each well will be closely monitored and flow adjusted accordingly to keep water levels approximately ten feet below land surface at the wellhead. Figure 10 below indicates that water levels at MW02, located approximately 2,700’ from both Desert Springs 1 and Desert Springs 2 ASR wells, respond favorably to the proposed recharge activities.

**Figure 9. Estimated water level response at Desert Springs 3**



**Figure 10. Estimated response approximately 2,700 feet from recharge activities**



**Groundwater Monitoring Plan**

The proposed project includes monitoring, measurement, and analyses to ensure that the ASR wells are operating effectively and that groundwater levels and groundwater quality response is recorded. Water levels and water quality will be monitored at each of the proposed ASR wells and from a series of existing monitoring wells nearby. Eighteen monitoring wells and one production well near the three ASR retrofit wells (Desert Springs 1, 2, & 3) will be monitored for various constituents to help track the movement of recharge water and the potential reduction of high nitrate concentrations that currently exist near these three recharge wells. The following wells will be monitored before start-up and quarterly for 18 months following start-up of the ASR wells: DSMW01, DSMW04, MW01, MW02, MW03, MW04, MW05, MW06, MW07, MW24, MW25, MW26, MW27, MW28, MW34, MW35, MW36, MW37, and Spring Creek 2 well. Each sample will be analyzed for the following constituents: nitrate, chloride, sulfate, TDS, and TTHMs at intervals outlined below. Table 3 describes the locations and frequency of monitoring and sampling events as well as the analyses to be performed on each sample.

**Table 3: Well, analyses, and sampling intervals**

Sample Location	Matrix	Type of Well		Sample Constituent and Frequency			Screened Interval (feet below land surface)
		MW	Muni	Water Level	Field Parameters (pH, EC, Turbidity, DO, Temp, ORP)	NO <sub>3</sub> -N, Cl-, Sulfate, TDS, TTHM	
DS1	AQ		X	Continuous	Quarterly	Quarterly	122 - 192
DS2	AQ		X	Continuous	Quarterly	Quarterly	238 - 360
DS3	AQ		X	Continuous	Quarterly	Quarterly	58 - 267
SC2	AQ		X	Continuous	Quarterly	Quarterly	120 - 220
DSMW01	AQ	X		Continuous	Quarterly	Quarterly	110 - 190
DSMW04	AQ	X		Continuous	Quarterly	Quarterly	70 - 200
MW01	AQ	X		Continuous	Quarterly	Quarterly	60 - 120
MW02	AQ	X		Continuous	Quarterly	Quarterly	50 - 90*
MW03	AQ	X		Continuous	Quarterly	Quarterly	37 - 77
MW04	AQ	X		Continuous	Quarterly	Quarterly	30 - 70
MW05	AQ	X		Monthly	Quarterly	Quarterly	43 - 93
MW06	AQ	X		Monthly	Quarterly	Quarterly	30 - 70
MW07	AQ	X		Monthly	Quarterly	Quarterly	30 - 70
MW24	AQ	X		Monthly	Quarterly	Quarterly	130 - 145
MW25	AQ	X		Monthly	Quarterly	Quarterly	6 - 26
MW26	AQ	X		Monthly	Quarterly	Quarterly	153 - 158
MW27	AQ	X		Continuous	Quarterly	Quarterly	142 - 147
MW28	AQ	X		Monthly	Quarterly	Quarterly	131 - 136
MW34	AQ	X		Continuous	Quarterly	Quarterly	35 - 55
MW35	AQ	X		Continuous	Quarterly	Quarterly	126 - 136
MW36	AQ	X		Continuous	Quarterly	Quarterly	41 - 61
MW37	AQ	X		Continuous	Quarterly	Quarterly	131 - 141

\*estimated

**Metering/Water Measurement Projects**

***Explain why this is a necessary sub-component of another eligible Drought Resiliency Project as described in Tasks A-D.***

The water meters and SCADA controls included in the proposed project are critical in order to ensure the safe and efficient operation and monitoring of the recharge activities included in this project. Water meters will measure and report the flow rate and quantity of water being injected, while downhole transducers will measure and report the depth of recharged water in the well. SCADA controls will allow remote adjustment of flow in order to prevent water from surfacing, and can be configured to automatically stop recharge if a dangerous situation (such as water surfacing) were about to occur.

***To what extent are the methods tested/proven?***

TMWA operates all of its wells with water meters and SCADA controls that are standard in the industry.

***To what degree will the project improve the ability to predict the onset of drought earlier and/or with more certainty? To what degree will the project improve the ability to anticipate the severity and magnitude of drought?***

The metering and monitoring included in this project do not have the ability to predict the onset, severity, or magnitude of drought, but will allow TMWA to react to initiate, control, and terminate recharge events more quickly when weather dictates favorable or unfavorable

conditions (excess water available for recharge or wells are required to pump due to water shortages).

***To what degree will the project improve the likelihood/timing of detecting mitigation action triggers?***

The proposed metering, monitoring, and SCADA controls will be able to detect high water conditions within the wells and allow for automated flow responses to mitigate the situation.

**Evaluation Criteria B**

***Explain how the applicable plan addresses drought.***

In general, TMWA's ongoing ASR program enhances local groundwater supplies and directly benefits drought resiliency. This proposed project would expand the capacity of TMWA's ASR system into SSV. This proposed project's benefits to drought resiliency are two-fold. First, the project would allow surface water to be stored during the winter months, increasing the overall amount of groundwater TMWA can extract in SSV, thus reducing the total amount of POSW needed during times of drought. Second, bolstering groundwater supplies in this outlying area of the TMSA provides more flexibility in the delivery system of POSW during times of drought by offsetting the need for additional surface water to be diverted to SSV.

In order to provide sustainable water resources, TMWA produces a 20-year Water Resource Plan every 5 years. The ASR program is supported by TMWA's 2035 WRP, of which the relevant sections are attached to this proposal. The 2035 WRP is TMWA's management plan for securing and delivering water resources to its customers during both drought and non-drought years. Further chapters of the 2035 WRP identify projects TMWA can and will implement to address climate change and drought. TMWA's proposed well retrofit project directly supports resiliency toward drought by increasing TMWA's ASR capabilities and utilization of groundwater resources.

***Describe how your proposed drought resiliency project is supported by an existing drought plan. Does the proposed project implement a goal or need identified in the drought plan?***

Having ASR capabilities across the TMSA is the lynchpin to TMWA's conjunctive use management approach to drought. TMWA's 2035 WRP defining the importance ASR as a mitigation action for drought resiliency as "TMWA's ongoing ASR projects have improved or stabilized groundwater levels in and around the injection sites thereby preserving TMWA's ability to utilize its groundwater resources to meet the peaking and/or Drought Situation pumping requirements without degrading groundwater quality in the process. ASR is one element of TMWA's integrated management strategy to augment drought reserve supplies for later use during a Drought Situation. ASR, together with TMWA's POSW and credit water releases and increased groundwater pumping, create opportunity to maximize and expand service commitments while meeting critical-year-water-supply requirements during drought periods; this is a primary purpose of water resource planning for the Truckee Meadows (page 81)."

***Describe how the proposed project is prioritized in the referenced drought plan? Does the drought plan identify the proposed project as a potential mitigation or response action?***

The proposed project is explicitly supported by the 2035 WRP. Chapter 6 of the 2035 WRP identifies equipping the wells in SSV with ASR as a **priority** project for future water resources. The 2035 WRP states "An additional ASR opportunity may exist with using ... well facilities in Spanish Springs for recharge; there may be sufficient capacity that could be used during drought years to extract additional groundwater (pages 140 and 141)."

***Explain whether the drought plan was developed with input from multiple stakeholders. Was the drought plan developed through a collaborative process?***

The 2035 WRP is a collaborative effort between TMWA and relevant stakeholders. Comments, concerns, and questions by various interest groups and customers were gathered during a series of public workshops and a month-long commenting period. All comments were addressed and revisions were made to the 2035 WRP based on feedback from stakeholder input.

***Does the drought plan include consideration of climate change impacts to water resources or drought?***

Chapter 2 of the 2035 WRP outlines how climate change could impact water resources and how it is likely to affect the persistence of drought in the Truckee Meadows. A copy of all relevant chapters of the 2035 WRP is attached at the end of this proposal.

**Evaluation Criteria C**

***What are the ongoing or potential drought impacts to specific sectors in the project area if no action is taken and how severe are those impacts? Impacts should be quantified and documented to the extent possible.***

To meet demands of the 16,000 customers within SSV, TMWA's primary source of supply is surface water. However, groundwater pumping in SSV is required to meet peak demands in some, if not all, of the summer months (May through September), or during emergency conditions when surface water delivery is curtailed. The amount of groundwater required to offset the delivery of surface water has a direct relationship to surface water availability, which is a function of drought conditions. There are potential impacts to the quantity and quality of water available for municipal use. Moreover there are impacts to the groundwater environment itself. Each of these issues is described in more detail in the sections below.

***Are there public health concerns / social concerns associated with current or potential drought?***

SSV has an alternative source of supply given that it is connected to the greater distribution system that serves the area depicted in Figure 2 in the Background Information section. Although there is an alternative source of supply, those supplies come from two main sources: surface water and groundwater. Within the TMSA, surface water provides for approximately 80% of total demands, while groundwater makes up the remaining 20%. These quantities vary both regionally and seasonally. When available, surface water makes up 100% of the supply year-round. During drought periods, surface water may not be available for up to 5 months of the year, meaning groundwater is required. During droughts, groundwater wells in SSV supply up to 100% of the demand, putting additional stress on an already stressed aquifer. Historically, groundwater wells in SSV supplied all demand in SSV, which led to continuous water level declines over time. However, since 2009, surface water supplied most of SSV's demand and groundwater was a supplement during high-demand month and drought periods. Due to nitrate contamination on the west side of SSV, wells from the east side of SSV were pumped heavily to make up this shortfall.

The proposed project will address public health and environmental concerns associated with the existing drought and future drought situations in four major ways. Surface water recharged in the west side wells during wet months and wet years will: (1) reduce nitrate concentrations near the recharged wells and prevent potential violations of drinking water standards; (2) decrease net groundwater withdrawals from the basin, leaving more water

available in the aquifer to help stabilize groundwater; (3) allow west side wells to be pumped in the summer and drought years when they were avoided in the past due to nitrate concerns; and (4) allow east side wells to be rested and water levels in that area to recover as more water comes from west side wells.

***Whether there are ongoing or potential environmental impacts?***

Refer to Evaluation Criteria A.

***Are there any local, or economic losses associated with current drought conditions?***

TMWA is not aware of any past or ongoing local economic losses associated with current drought conditions in SSV. However, should the drought persist and pumping continue as the sole source of water supply during the summer months, the 140 domestic well owners in the area could be faced with a situation where their wells can no longer draw adequate water to meet their needs. Should this happen, these well owners would be forced to drill deeper into the aquifer, causing them significant economic hardship.

***Are there other drought-related impacts not identified above?***

The primary challenge in SSV is bringing groundwater back into balance with consideration of customer demands during drought periods and of maintaining a high standard of water quality in the SSV area. If water levels in SSV continue to decline, it could create tension among the customers in SSV over reductions in water quality. Furthermore, tension could arise among the domestic well owners should they be forced to drill deeper wells.

***Is the project in an area that is currently suffering from drought?***

As stated in Background section of this proposal, the Truckee Meadows area is currently experiencing its fourth consecutive year of drought, with the winter of 2015 being the worst in recorded history.

***Describe any projected increases to the severity or duration of drought in the project area resulting from climate change.***

According to USBR Truckee Basin Study, the Truckee Meadows region is likely to experience hotter temperatures and potentially drier conditions in the future. Details on the Truckee Basin Study, can be found online at:

<http://www.usbr.gov/watersmart/bsp/docs/finalreport/truckee/tbsbasinstudyexecutivesummary.pdf>.

Should this dismal outlook hold true, it will have increased adverse effects to natural recharge on the already depleted groundwater supplies in SSV. Increased reliance on pumping during times of drought increases water quality concerns associated with nitrate and arsenic. Given this climate forecast for the region, increasing the amount of ARS in SSV is of utmost importance. Current municipal well recharge taking place on the west side and southeast side of SSV has shown marked improvement on the groundwater levels. Furthermore, water quality in those areas has improved.

**Evaluation Criteria D**

***Describe the implementation plan of the proposed project.***

The project can begin as soon as grant funds are approved. The project will begin with development of bid documents for open-bidding purposes. Once contracts are received and contractors selected, the proposed work schedule can be finalized and work can commence. Included below is an estimated schedule of work, with a timeline for each stage of work, broken down by task, including major milestones, by month (see Table 4).

***Describe any permits that will be required, along with the process for obtaining such permits.***

Retrofit construction activities are anticipated to take place on private property. Should the construction work take place on municipal property, TMWA will obtain all necessary permits through the Cities of Reno or Sparks, or Washoe County on an as needed basis.

Discharges related to the rehabilitation and testing of the wells are permitted through the Nevada Division of Environmental Protection (NDEP). TMWA is authorized under Permit # NV0024031 to discharge system-wide for operation and maintenance activities (included well testing and rehabilitation as proposed herein). The Permit Fact Sheet is included as an attachment.

The NDEP requires an Underground Injection Control (UIC) Permit in order to inject water with the State of Nevada to prevent the degradation of all potential and current underground sources of drinking water. TMWA has already applied for and received the UIC Permit for all potential ASR wells in Spanish Springs SSV. UIC Permit UNEV2009202 covering Desert Springs wells 1, 2, and 3 is attached.

The NDWR through the Nevada State Engineer (NSE) requires a permit for any project to recharge, store, and recover water underground. TMWA actively operates one well under permit approval of the NSE on the east side of the SSV, and dozens of other NSE-approved wells throughout the water service territory. TMWA is currently finalizing application to recharge, store, and recover water in 4 wells on the west side of the SSV (which includes Desert Springs 1, 2, and 3) and plans to submit the permit application by the end of May 2016.

***Identify and describe any engineering or design work performed specifically in support of the proposed project.***

The flow control valves will require engineering and design work. This work is anticipated to be performed by Baski, Inc., out of Denver, Colorado; the developer and manufacturers of the FCV downhole control valves. Each valve has to be hand-made to meet the individual well constraints and flow requirements for the proposed application. These costs are included in the cost estimate provided by Baski, Inc. and are included as attachments to the budget.

***Describe any new policies or administrative actions required to implement the project.***

No new policies or administrative actions are required to implement the project.

## **Evaluation Criteria E**

***How is the proposed project connected to a Reclamation project or activity?***

This proposed project is not directly related to a Reclamation project or activity, however the proposed project is consistent with the Reclamation's suggested steps to mitigate future drought. Page 45 of the Reclamation's Truckee Basin Study – Executive Summary Report recommends incorporating future risks into existing water user plans.

***Does the applicant receive Reclamation project water?***

This proposed project using TMWA existing water rights and does not rely on Reclamation project water.

***Is the project on Reclamation project lands or involving Reclamation facilities?***

While the proposed project is not located on Reclamation project lands, TMWA receives surface water from reservoirs operated by Reclamation.

***Is the project in the same basin as a Reclamation project or activity?***

The proposed project will take place in SSV, which is part of the Truckee River Basin. The Truckee River Basin was a study area for the Reclamation's Basin Study Program.

***Will the proposed work contribute water to a basin where a Reclamation project is located?***

The proposed project will contribute water to the Truckee River Basin, which is part of the Reclamation's Basin Study Program.

***Will the project help Reclamation meet trust responsibilities to any tribe(s)?***

This proposed project is not anticipated to help Reclamation meet trust responsibilities with the local Pyramid Lake Paiute Tribe.

**Performance Measures**

Wells targeted for ASR are older assets that (1) have reduced efficiencies, (2) are unable to be recharged, and (3) are impacted by nitrogen from septic tanks in the area. The performance measures for the proposed project will address the efficacy of each solution to these three problems in a quantitative manner.

1. Each well will be tested to determine a baseline efficiency rating, which will be determined with a three- to four-step pumping test whereby the well is subjected to increasing flow rates over discrete 100-minute intervals for a total of four steps. Once the baseline efficiency is determined, the well will be rehabilitated as described in the Technical section. After rehabilitation, the well will be step-tested again, in the same manner and with the same pumping rates and time intervals, to determine the post-rehabilitation efficiency. The increase in efficiency gained, after rehabilitation efforts, is calculated by subtracting the baseline rating from the post-rehab rating.
2. The performance criteria for successful conversion to an ASR well is fairly straight-forward. Since these wells are unable to be converted through traditional methods (downhole recharge lines), the addition of an in-line flow control valve to allow the well to be recharged will be considered a successful conversion. Successful conversion will also be determined by 1) the amount of water recharged to the aquifer and 2) the water level response in the area. The wellhead piping and SCADA control modifications will allow the amount of water recharged to be metered, measured, and controlled. The flow rate, total flow volume, and water level within each recharge well will be transmitted, via SCADA telemetry, and the data is tracked, plotted, and stored on redundant servers. Additionally, surrounding wells will be monitored with dedicated transducers which measure and record water levels on an hourly basis. Water level data will be verified bi-monthly with hand-measurements and downloaded at that time. Successful recharge with respect to the volume of water recharged will be determined by the ratio of recharged water to pumped water on a seasonal basis. The goal is to have greater than 50% of the water pumped during the summer season coming from water recharged through the ASR wells. Successful recharge with respect to water level response will be measured by comparing the pre-pumping water level before recharge start-up to a water level 12 months later (or before pumping starts again, whichever comes first). An increase in water levels in the ASR well and surrounding monitoring wells will be indicative of successful recharge.
3. The final performance measure will quantify the spin-off benefit of reduced nitrogen concentrations at each ASR well. Baseline samples, as described in the monitoring plan, will be collected from each ASR well and the subset of monitoring wells nearby for nitrate and other constituents. These wells will be monitored quarterly for the same constituents. Although it is uncertain when the recharge water will reach each monitoring point, it is

anticipated that a reduced nitrate values within each ASR well will occur almost immediately and at surrounding monitoring locations over time. It is assumed that the nearest monitoring points will see reduced nitrate concentrations quicker than monitoring points further away. Water quality improvement will be calculated by comparing end-of-project nitrate concentrations with baseline pre-project nitrate values at all wells. Success will be determined by any reduction in nitrate over time within the ASR wells and the aquifer.

**Table 4: Estimated Project Schedule of Major Tasks and Milestones by Month**

Task	2016			2017												2018									
	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Pre-Rehab Well Testing	■	①																							
Well Rehabilitation		■	②	③	④																				
Downhole Modifications				⑤	⑥	⑦																			
Wellhouse Piping Modifications	■	■		⑧																					
Post-Rehab Well Testing					■	⑨																			
Recharge							⑩	■	■	■				■	■	■	■	■	■	■	■	■			
Pump										■	■	■	■	■							■	■	■	■	
Project Monitoring	⑪	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Reporting																								⑫	

■ Indicates task is taking place during a given month.

Milestones:

- ① All pre-Rehab well efficiency testing completed and data analyzed.
- ② Desert Springs 1 Well Rehabilitated
- ③ Desert Springs 2 Well Rehabilitated
- ④ Desert Springs 3 Well Rehabilitated
- ⑤ Desert Springs 1 Well Flow Control Valve Installed and Tested
- ⑥ Desert Springs 2 Well Flow Control Valve Installed and Tested
- ⑦ Desert Springs 3 Well Flow Control Valve Installed and Tested
- ⑧ All wellhouse piping mods completed
- ⑨ All post-Rehab well efficiency test completed and data analyzed.
- ⑩ Recharge begins in all new retrofit wells.
- ⑪ Project monitoring begins with collection of baseline water quality sampling and water level measurements. Water levels measured continuously if not monthly hereafter. Groundwater water quality sampling occurs quarterly hereafter.
- ⑫ Bi-Annual Reporting culminates in a Final Report upon project completion.

**Environmental and Cultural Resources Compliance**

*Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)?*

The proposed project will not negatively impact the surrounding environment. As part of the project, each of the three wells will have a small shallow trench constructed to connect control components from the well house to each well (trench details below). Trenching will occur in a suburban environment within the well yard, which has soils that were previously-disturbed when the wells were originally constructed. Trenching work will not affect the air, water, or animal habitat in the project area. If dust becomes an issue, the area will be wetted for dust control. Recharged water will remain underground and will not be allowed to surface.

Well	Width	Depth (feet)	Length
Desert Springs 1	1	1.5	6
Desert Springs 2	1	1.5	13
Desert Springs 3	1	1.5	5

*Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area?*

We are not aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area.

*Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as “Waters of the United States?”*

There are no wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction.

*When was the water delivery system constructed?*

TMWA’s water main system components can date back as far as the 1920’s. This proposed project will retrofit water main components constructed in 1990, 1963, and 1979 (Desert Springs 1, Desert Springs 2, and Desert Springs 3, respectively).

*Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)?*

No, the proposed project will not result in any modification of or effects to individual features of an irrigation system.

*Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?*

No, there are no buildings, structures, or features in the project area that are listed or eligible for listing on the National Register of Historic Places.

*Are there any known archeological sites in the proposed project area?*

No, there are no known archaeological sites in the proposed project area as each well occurs on previously-disturbed sites.

*Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?*

No, the proposed project will not have a disproportionately high and adverse effect on low income or minority populations. The project will modify and improve water system components that help serve the diverse population of Spanish Springs Valley.

*Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands?*

No, the proposed project will not limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands. The project occurs within TMWA-owned parcels.

*Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?*

No, the proposed project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.

**Funding Plan**

**Project Title: Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency**

Contributed funding by the applicant includes in-kind support of salaries of staff to this Project and additional resources related to materials and equipment necessary to support this Project. The source of applicant’s matching funds for this proposed Project will be obtained through the Truckee Meadows Water Authority’s Capital Improvement Project budget which is apportioned by water sales revenues. No additional cost-share by other entities is included in this Project. No costs will be incurred prior to the proposed Project’s start date. No additional federal funding will be committed to this project. Moreover, no additional federal funding is pending for this project. Non-federal funding will be available at the start of the project (October 1, 2016). No expenses will be incurred prior to the start of the project. Additionally, no time constraints or other contingencies are anticipated for this project.

*Table 1: Funding by Source*

<b>Funding Source</b>	<b>Funding Amount</b>
<b>Non-Federal Entities</b>	
1. Truckee Meadows Water Authority	\$490,240
<b>Non-Federal Subtotal</b>	<b>\$490,240</b>
<b>Other Federal Entities</b>	
N/A	
<b>Other Federal Subtotal</b>	<b>\$0</b>
<b>Requested Reclamation Funding</b>	<b>\$300,000</b>
<b>Total Project Funding</b>	<b>\$790,240</b>

*Table 2: Funding Request by Year*

	<b>Funding request</b>	
	<b>Year 1</b>	<b>Year 2</b>
<b>Funding requested</b>	\$300,000	\$0

**Desert Springs Wells Rehabilitation Budget Proposal**

BUDGET ITEM DESCRIPTION	Year 1				Year 2				GRAND TOTALS
	COMPUTATION		Quantity Type	TOTAL COST	COMPUTATION		Quantity Type	TOTAL COST	
	\$/Unit	Quantity			\$/Unit	Quantity			
<b>Salaries and Wages</b>									
Senior Hydrogeologist	\$ 45.28	260	Hours	\$11,773	\$ 46.41	64	Hours	\$2,970	\$14,743
Hydrogeologist	\$ 42.43	130	Hours	\$5,516	\$ 43.68	15	Hours	\$655	\$6,171
Associate Hydrogeologist	\$ 36.00	120	Hours	\$4,320	\$ 36.90	200	Hours	\$7,380	\$11,700
Supervisor Operations Maintenance	\$ 48.85	32	Hours	\$1,563	\$ 50.07	32	Hours	\$1,602	\$3,165
Mechanic Specialist M/C W/P	\$ 39.76	120	Hours	\$4,772	\$ 40.76	64	Hours	\$2,608	\$7,380
Mechanic Specialist M/C W/P	\$ 39.76	180	Hours	\$7,157	\$ 40.76	0	Hours	\$0	\$7,157
Principal Architect SCADA	\$ 53.14	132	Hours	\$7,014	\$ 54.47	43	Hours	\$2,342	\$9,357
Technician, SCADA	\$ 42.39	118	Hours	\$5,002	\$ 43.45	39	Hours	\$1,695	\$6,697
Technician, Plant Electrical	\$ 42.39	48	Hours	\$2,035	\$ 43.45	16	Hours	\$695	\$2,730
<b>Total Salaries and Wages</b>		<b>1140</b>		<b>\$49,152</b>		<b>473</b>		<b>\$19,948</b>	<b>\$69,100</b>
<b>Fringe Benefits 48%</b>									
Senior Hydrogeologist	\$ 45.28	260	Hours	\$5,651	\$ 46.41	30	Hours	\$668	\$6,319
Hydrogeologist	\$ 41.58	130	Hours	\$2,595	\$ 42.62	15	Hours	\$307	\$2,901
Associate Hydrogeologist	\$ 36.00	120	Hours	\$2,074	\$ 36.90	60	Hours	\$1,063	\$3,136
Supervisor Operations Maintenance	\$ 48.85	32	Hours	\$750	\$ 50.07	32	Hours	\$769	\$1,519
Mechanic Specialist M/C W/P	\$ 39.76	120	Hours	\$2,290	\$ 40.76	64	Hours	\$1,252	\$3,542
Mechanic Specialist M/C W/P	\$ 39.76	180	Hours	\$3,435	\$ 40.76	0	Hours	\$0	\$3,435
Principal Architect SCADA	\$ 53.14	132	Hours	\$3,367	\$ 54.47	43	Hours	\$1,124	\$4,491
Technician, SCADA	\$ 42.39	118	Hours	\$2,401	\$ 43.45	39	Hours	\$813	\$3,214
Technician, Plant Electrical	\$ 42.39	48	Hours	\$977	\$ 43.45	16	Hours	\$334	\$1,310
<b>Total Fringe Benefits</b>		<b>1140</b>		<b>\$23,540</b>		<b>299</b>		<b>\$6,330</b>	<b>\$29,870</b>
<b>Total Wages and Benefits</b>				<b>\$72,692</b>				<b>\$26,279</b>	<b>\$98,970</b>
<b>Construction Costs Desert Springs Wells 1,2,3</b>									
Environmental Compliance	\$ 10,000.00	1	Contract	\$10,000				\$0	\$10,000
Well Rehabilitation w/ Acid Treatment	\$ 328,922.00	1	Contract	\$328,922				\$0	\$328,922
Well House Piping Modifications	\$ 42,000.00	1	Contract	\$42,000				\$0	\$42,000
SCADA Modifications	\$ 59,355.00	1	Contract	\$59,355				\$0	\$59,355
ASR Valves	\$ 160,000.00	1	Contract	\$160,000				\$0	\$160,000
Laboratory Analytical Sampling	\$ 2,736.00	3	Contract	\$8,208	\$ 2,736.00	4	Contract	\$10,944	\$19,152
<b>Total Construction Costs</b>				<b>\$608,485</b>				<b>\$10,944</b>	<b>\$619,429</b>
<b>TOTAL DIRECT COSTS</b>				<b>\$681,177</b>				<b>\$37,223</b>	<b>\$718,399</b>
<b>Indirect Costs -</b>									
Administration	10%		Indirect	\$68,118	10%		Indirect	\$3,722	\$71,840
<b>TOTAL ESTIMATED PROJECT COSTS</b>				<b>\$749,294</b>				<b>\$40,945</b>	<b>\$790,240</b>

Funding Sources	Percent of Total Project Cost	Total Cost by Source
Recipient Funding	62%	\$490,240
Other Recipient Funding		
Reclamation Funding	38%	\$300,000
Other Federal Funding		
<b>TOTALS</b>	<b>100%</b>	<b>\$790,240</b>

## Budget Narrative

### **Project Title: Municipal Well Aquifer Storage and Recovery Retrofit Project for Drought Resiliency**

#### **U.S. Bureau of Reclamation**

**Total Cost: \$790,240**

**Total Costs Requested: \$300,000**

#### **Truckee Meadows Water Authority**

**Total Cost Match (in-kind): \$490,240**

#### **Salaries and Wages: \$69,100 -**

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**Senior Hydrogeologist – Christian Kropf (Program Manager)**, will contribute 16% of his time as in-kind match in each year. This amounts to 40 days over the 2 years (or 32 and 8 days respectively), at a daily rate of \$362.24, for a total of \$14,743 in contributed salary. This total reflects a salary increase of 3% in year 2. In each year of the project Kropf will devote this time to verifying the project is carried out according to the schedule provided in the narrative as well as all duties related to the performance and financial reporting requirements set by the U.S. Bureau of Reclamation's terms of agreement. He will write bid documents and oversee contracts to perform the work and will provide direction and oversight in the field to ensure the project tasks and milestones are completed.

**Hydrogeologist – Nick White (Field Oversight)**, will contribute 7% of his time as in-kind match in each year. This amounts to 18 days over the 2 years (or 16 days and 2 days respectively), at a daily rate of \$339.44, for a total of \$6,171 in contributed salary. This total reflects a salary increase of 3% in year 2. In each year of the project White will devote this time to oversight of rehabilitation and testing activities in the field to ensure the project tasks and milestones are completed. He will also perform data analyses and provide recommendations on rehabilitation and recharge activities, as well as assist in required reporting.

**Associate Hydrogeologist – Lauren Roaldson (Monitoring)**, will contribute 15% of her time as in-kind match in each year. This amounts to 40 days over the 2 years (or 15 and 25 days respectively), at a daily rate of \$288.00, for a total of \$11,700 in contributed salary. This total reflects a salary increase of 3% in year 2. In years 1 and 2 of the project Roaldson will perform

baseline water quality sampling, along with post-retrofit sampling at municipal wells and a number of associated groundwater monitoring wells. She will provide data analyses to track changes to groundwater quality, including water level response over time and assist in required reporting.

**Supervisor, Operations and Maintenance – Bryce Twitchell (Construction Supervisor)**, will contribute 3% of his time as in-kind match in each year. This amounts to 8 days over the 2 years (or 4 days and 4 days respectively), at a daily rate of \$390.80, for a total of \$3,165 in contributed salary. This total reflects a salary increase of 3% in year 2. The Foreman has the necessary knowledge, experience, and training to work with and direct the activities of a crew engaged in distribution piping modifications related to the redirection of water to the well for recharge. In each year of the project the Supervisor will devote time to manage day-to-day construction operations of the project, with more time devoted to the first 6 months during construction activities. Activities include: preparing work plan sketches, specifications, and written instructions, and prepare proper notes and records. In addition, the Supervisor will keep the crew on schedule and ensure all requirements related to workplace safety and local and state laws are met.

**Mechanic Specialist - TBD (Piping Modifications)**, will contribute 9% of their time as in-kind match in each year. This amounts to 23 days over the 2 years (or 15 and 8 days respectively), at a daily rate of \$318.10, for a total of \$7,380 in contributed salary. This total reflects a salary increase of 3% in year 2. The Mechanic, who is a Journeyman, is qualified by experience, training and knowledge to install and repair water services, meters, and do pipe fitting and operate equipment such as earth boring machines, all types of tapping machines, pipe locators, concrete saws and compressors. In the first year of the project the Mechanic will devote the first 6 months to active construction activities such as removing ineffective equipment, installing new meters, piping, transducers, and SCADA devices, as appropriate, and ensuring the new recharge conveyance system is working properly. The remaining 18 months will be devoted to repairs, maintenance, and monitoring to ensure proper operation of the recharge lines.

**Mechanic Specialist - TBD (Well Rehabilitation Oversight)**, will contribute 9% of their time as in-kind match, and will only be required on the project for the first 6 months of the project. This amounts to 23 days over 6 months, at a daily rate of \$318.10, for a total of \$7,157 in contributed salary. The Mechanic, who is a Journeyman, is qualified by experience, training and knowledge to oversee the proper inspection, testing, cleaning, and rehabilitation of municipal wells as well as install and repair water services, meters, and do pipe fitting and operate equipment such as earth boring machines, all types of tapping machines, pipe locators, concrete saws and compressors. In the first 6 months of the project the Mechanic will oversee the field activities of the rehabilitation contractor to ensure the well is rehabilitated as described in the work plan and as agreed upon in the bid contract.

**Principal Architect SCADA – TBD (Telemetry Controls)**, will contribute 8% of their time as in-kind match in each year. This amounts to 22 days over the 2 years (or 17 days and 5 days respectively), at a daily rate of \$425.12, for a total of \$9,357 in contributed salary. This total reflects a salary increase of 3% in year 2. In each year of the project, at the Principal SCADA Architect will devote time to modify, develop, and deploy SCADA visualization screens, develop and deploy network addressing scheme for new field devices, integrate new field communication devices into monitoring system, and manage transition of communications medium for converted sites (radio network to wireless IP).

**Technician, SCADA - TBD (Telemetry Controls)**, will contribute 5% of their time as in-kind match in each year. This amounts to 12 days over the 2 years (or 9 days and 3 days respectively), at a daily rate of \$339.12, for a total of \$6,697 in contributed salary. This total reflects a salary increase of 3% in year 2. In each year of the project, at the request of the Supervisor, the SCADA Technician will devote time to disconnecting the existing SCADA control systems for each well in the project, and reconnecting all new and required controls including those that monitor, regulate, and remotely control flow, discharge, water level, valves, transducers, and associated relays and data storage devices. The SCADA Technician has experience and aptitude in all areas of computer logic; controls, interfacing and system integration and is qualified to maintain, repair, install, and troubleshoot various water system instruments, electronic devices and motor control devices, including but not limited to calibration and/or repair of all primary sensors, chlorination equipment, meters, pressure switches, etc.; problem analysis and/or replacement/repair of telemetry communications circuits, circuit breakers, fuses, control wiring and other electrical motor control equipment; programming of logic for controllers and system software; troubleshooting remote terminal signals and computer integration systems.

**Technician, Plant Electrical - TBD (Electrical Connections)**, will contribute 3% of their time as in-kind match in each year. This amounts to 8 days over the 2 years (or 6 days and 2 days respectively), at a daily rate of \$339.12, for a total of \$2,730 in contributed salary. This total reflects a salary increase of 3% in year 2. The Electrician Technician, who is a Journeyman, is engaged in testing, repairing, maintaining and installing all types of electric and electronic equipment and related components in generating stations, water production and related facilities. In each year of the project, at the request of the Supervisor or Mechanic, the Electrical Technician will devote time unwiring and rewiring all electrical components necessary to the proposed project and ensure their proper electrical operation and maintenance. He may also instruct or advise operating personnel on problems pertaining to electrical equipment.

**Total Salaries and Wages:**

**Contributed Year 1: \$49,152**

**Year 2: \$19,948**

**Fringe Benefits: \$29,870**

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All fringe benefit rates are based on Truckee Meadow Water Authority's Resolution 6 titled a Resolution Adopting Employee Wages and Benefits Provided to Management, Professional, Administrative, and Technical Employees (see the Resolution 6 attachment).

**Senior Hydrogeologist – Christian Kropf (Program Manager)**, will contribute \$6,319 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$362.24 and a fringe rate of 48%.

**Hydrogeologist – Nick White (Field Oversight)**, will contribute \$2,901 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$339.44 and a fringe rate of 48%.

**Associate Hydrogeologist – Lauren Roaldson (Monitoring)**, will contribute \$3,136 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$288.00 and a fringe rate of 48%.

**Supervisor, Operations and Maintenance (Construction Supervisor)**, will contribute \$1,519 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$390.80 and a fringe rate of 48%.

**Mechanic Specialist - TBD (Piping Modifications)**, will contribute \$3,542 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$318.10 and a fringe rate of 48%.

**Mechanic Specialist - TBD (Well Rehabilitation oversight)**, will contribute \$3,435 in fringe benefits as in-kind for the first 6 months of the project. This reflects a daily rate of \$318.10 and a fringe rate of 48%.

**A Principal Architect, SCADA (Telemetry Controls)**, will contribute \$4,491 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$425.12 and a fringe rate of 48%.

**A Technician, SCADA (Telemetry Controls)**, will contribute \$3,214 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$339.10 and a fringe rate of 48%.

**A Technician, Plant Electrical (Electrical Connections)**, will contribute \$1,310 in fringe benefits as in-kind match over the 2 years of the project. This reflects a daily rate of \$339.12 and a fringe rate of 48%.

**Total Fringe Benefits:**

**Contributed Year 1: \$23,540**

**Year 2: \$6,330**

**Construction Costs: \$619,429 – Desert Springs Wells 1,2,3**

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Construction costs for materials and supplies associated with the flow control valves, pipe fittings, meter installations, SCADA modifications, well rehabilitation, laboratory analytical, and environmental compliance services required to conduct the rehabilitation and ASR well retrofits over the 2 years of this project; all or most of which occurs in year 1 of the project. See PriceQuotes attachment for more details and price listing and contract bids.

**Environmental Compliance** – the project will require an estimated \$10,000 in order to ensure compliance with all environmental regulations.

**Well Rehabilitation** – the project will require \$328,922 in Year 1 for work related to rehabilitation (including acid treatment) of the three wells.

**Well House Piping Modification** – The project will require \$42,000 in material costs related to modifications of the well housing piping.

**SCADA Modification** – the project will require \$59,355 in material costs related to installation of the SCADA measurement hardware needed for well monitoring and performance measuring.

**ASR Valves** – the project will require \$160,000 in material costs related to the retrofitting of the well with ASR valve needed for water injections and recovery.

**Laboratory Analysis** – the project will require \$2,736 in costs related to laboratory analysis related to measure and monitoring of contamination levels of arsenic and nitrates. This analysis is critical to performance measures related to water quality and aquifer health.

**Requested Year 1: \$300,000**

**Year 2: \$0**

TMWA will contribute \$395,425 for contractual construction costs for materials and supplies associated with the flow control valves, pipe fittings, meter installations, and SCADA modifications, well rehabilitation, laboratory analytical, and environmental compliance services, required to conduct the rehabilitation and ASR well retrofits over the 2 years of this project; all or most of which occurs in year 1 of the project.

**Contributed Year 1: \$308,485      Year 2: \$10,944**

**Grand Total Direct Costs: \$718,399**

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**Requested Year 1: \$300,000      Year 2: \$0**

**Contributed Year 1: \$517,269      Year 2: \$57,171**

**Total Indirect Costs: \$71,840**

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TMWA will contribute all unrecovered indirect costs associated with this project over the 2 years. Indirect Costs are calculated using TMWA's indirect cost rate of 10% applied to staff's contributed salaries, benefits, equipment use, materials and supplies.

**Contributed Year 1: \$68,118      Year 2: \$3,722**

**Total Costs Contributed: \$490,240**

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The total of \$ is contributed through in-kind costs associated with staff salaries, fringe benefits, match, equipment use, materials and supplies, and unrecovered indirect costs associated with this project over the two years.

Year1: \$449,294

Year 2: \$40,945

<b>DESERT SPRINGS 1 WELL REHAB</b>					
<p>The Desert Springs 1 production well was constructed with 8" blank casing and screen to a total depth of 200 feet in 1990. The screen is 0.100" wire wrap screen set between 122'-192'. The contractor will: rehab the well, inspect and service the pump and pump motor, replace the pump column with a new epoxy coated and lined pump column, and equip the well for step testing, as specified below. All equipment and materials must be disinfected with bleach before placing in the well.</p>					
Item #	Activity	Scheduled Value	Unit	Unit Price	Total Price
1	Mobilization/Demobilization	1	\$ Lump Sum	\$5,000.00	\$ 5,000.00
2	Supply disinfection bleach, spray all materials and equipment used in the well.	1	\$ Lump Sum	\$ 500.00	\$ 500.00
3	Remove submersible motor. Inspect and balance rotor, and replace bearings if necessary. A TMWA electrician will unwire and rewire the motor.	1	\$ Lump Sum	\$5,800.00	\$ 5,800.00
4	Remove 4" pump column (approximate size).	112	\$ Per Foot	\$ 14.00	\$ 1,568.00
5	Inspect and service pump bowls.	1	\$ Lump Sum	\$2,800.00	\$ 2,800.00
6	Inspect and service discharge head.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
7	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
8	Provide and construct temporary discharge piping.	100	\$ Per Foot	\$ 5.00	\$ 500.00
9	Line brush the entire well to dislodge encrustations, and air-lift debris from the well.	7	\$ Per Hour	\$ 240.00	\$ 1,680.00
10	Use open-end pipe with tight-fitting single swab and airlift the well. Tag the well depth before and after air-lifting.	1	\$ Lump Sum	\$2,600.00	\$ 2,600.00
11	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
12	Line double-swab the well screen interval to open perforations, bail debris from the bottom of the well.	7	\$ Per Hour	\$ 240.00	\$ 1,680.00
13	Supply and install an in-line pump with a 10-foot double swab with a brush at the bottom. Pump and surge develop in 10-foot intervals with 5-foot overlap within screen intervals until each section is deemed clean by onsite TMWA representative.	21	\$ Per Hour	\$ 300.00	\$ 6,300.00
14	Install test pump to 112 feet bgs. Pump shall be capable of pumping up to 500 gpm from a pumping level of 100 feet bgs.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
15	Operate, maintain, and pump the well to waste during 6 to 8-hour step test.	8	\$ Per Hour	\$ 200.00	\$ 1,600.00
16	Remove the test pump and pump column.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
17	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
18	Supply and install a new epoxy-coated pump column with all the necessary appurtenances.	112	\$ Per Foot	\$ 160.00	\$ 17,920.00
19	Supply and install two 1-inch schedule 40 PVC sounding tube. The tube shall be bound to the pump column using stainless steel banding at intervals to be determined by TMWA. The tube shall have 90° elbows at the bottom terminating with 1-inch pipe plug, and a vented cap at the top.	220	\$ Per Foot	\$ 3.00	\$ 660.00
20	Supply a schematic of the motor, discharge head, pump, and pump column assembly, as installed.	1	\$ Lump Sum	\$ 150.00	\$ 150.00
21	Supply 20,000 gallons Baker Tank, store turbid purge water to settle out sediment, and neutralize chlorine before pumping to sewer or storm drain.	1	\$ Lump Sum	\$1,800.00	\$ 1,800.00
<b>TOTAL COST ESTIMATE FOR DESERT SPRINGS 1 WELL</b>					<b>\$ 56,858.00</b>

<b>DESERT SPRINGS 1 WELL REHAB - Acid Treatment</b>					
<p>Acid treatment, if required, shall be coordinated and formulated with the contractor. Below is an estimate of required activities to treat</p>					
Item #	Activity	Scheduled Value	Unit	Unit Price	Total Price
1	Furnish 161 gallons of 75% active Phosphoric Acid	161	\$ Per Gallon	\$ 24.00	\$ 3,864.00
2	Furnish 44 gallons of Johnson NW-310 acid enhancer	44	\$ Per Gallon	\$ 110.00	\$ 4,840.00
3	Mix acid with 2,200 gallons of water and spot inject in well screen intervals	0.75	\$ Per 3,000 Gallons	\$3,500.00	\$ 2,625.00
4	Agitate acid for 4 hours over a 24 hour period	4	\$ Per Hour	\$ 250.00	\$ 1,000.00
5	Install combination brushing, swabbing, and pumping tool to 200'. Purge well by pumping until all acid mix is removed. Discharge purge water to a surface tank and neutralize with caustic before discharging to sewer or storm drain.	1	\$ Lump Sum	\$5,000.00	\$ 5,000.00
6	Furnish 8 bags of caustic soda to neutralize acid	8	\$ Per Bag	\$ 140.00	\$ 1,120.00
<b>TOTAL COST ESTIMATE FOR DESERT SPRINGS 1 WELL</b>					<b>\$ 18,449.00</b>

<b>DESERT SPRINGS 2 WELL REHAB</b>					
<p>The Desert Springs 2 production well was constructed with 16" blank casing and screen to a total depth of 445 feet in 1963. The screen is 1/4" x 3" mill slot screen set between 238'-360'. The contractor will: rehab the well, inspect and service the pump and pump motor, replace the pump column with a new epoxy coated and lined pump column, and equip the well for step testing, as specified below. All equipment and materials must be disinfected with bleach before placing in the well.</p>					
Item #	Activity	Scheduled Value	Unit	Unit Price	Total Price
1	Mobilization/Demobilization	1	\$ Lump Sum	\$5,000.00	\$ 5,000.00
2	Supply disinfection bleach, spray all materials and equipment used in the well.	1	\$ Lump Sum	\$ 500.00	\$ 500.00
3	Remove submersible motor. Inspect and balance rotor, and replace bearings if necessary. A TMWA electrician will unwire and rewire the motor.	1	\$ Lump Sum	\$5,800.00	\$ 5,800.00
4	Remove 6" pump column (approximate size).	260	\$ Per Foot	\$ 14.00	\$ 3,640.00
5	Inspect and service pump bowls.	1	\$ Lump Sum	\$2,800.00	\$ 2,800.00
6	Inspect and service discharge head.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
7	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
8	Provide and construct temporary discharge piping.	100	\$ Per Foot	\$ 5.00	\$ 500.00
9	Line brush the entire well to dislodge encrustations, and air-lift debris from the well.	8	\$ Per Hour	\$ 240.00	\$ 1,920.00
10	Use open-end pipe with tight-fitting single swab and airlift the well. Tag the well depth before and after air-lifting.	1	\$ Lump Sum	\$2,600.00	\$ 2,600.00
11	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
12	Line double-swab the well screen interval to open perforations, bail debris from the bottom of the well.	8	\$ Per Hour	\$ 240.00	\$ 1,920.00
13	Supply and install an in-line pump with a 10-foot double swab with a brush at the bottom. Pump and surge develop in 10-foot intervals with 5-foot overlap within screen intervals until each section is deemed clean by onsite TMWA representative.	32	\$ Per Hour	\$ 300.00	\$ 9,600.00
14	Install test pump to 260 feet bgs. Pump shall be capable of pumping up to 750 gpm from a pumping level of 215 feet bgs.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
15	Operate, maintain, and pump the well to waste during 6 to 8-hour step test.	8	\$ Per Hour	\$ 200.00	\$ 1,600.00
16	Remove the test pump and pump column.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
17	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
18	Supply and install a new epoxy-coated pump column with all the necessary appurtenances.	260	\$ Per Foot	\$ 160.00	\$ 41,600.00
19	Supply and install two 1-inch schedule 40 PVC sounding tube. The tube shall be bound to the pump column using stainless steel banding at intervals to be determined by TMWA. The tube shall have 90° elbows at the bottom terminating with 1-inch pipe plug, and a vented cap at the top.	500	\$ Per Foot	\$ 3.00	\$ 1,500.00
20	Supply a schematic of the motor, discharge head, pump, and pump column assembly, as installed.	1	\$ Lump Sum	\$ 150.00	\$ 150.00
21	Supply 20,000 gallons Baker Tank, store turbid purge water to settle out sediment, and neutralize chlorine before pumping to sewer or storm drain.	1	\$ Lump Sum	\$1,800.00	\$ 1,800.00
<b>TOTAL COST ESTIMATE FOR DESERT SPRINGS 2 WELL</b>					<b>\$ 87,230.00</b>

<b>DESERT SPRINGS 2 WELL REHAB - Acid Treatment</b>					
<p>Acid treatment, if required, shall be coordinated and formulated with the contractor. Below is an estimate of required activities to treat</p>					
Item #	Activity	Scheduled Value	Unit	Unit Price	Total Price
1	Furnish 1,220 gallons of 75% active Phosphoric Acid	280	\$ Per Gallon	\$ 24.00	\$ 6,720.00
2	Furnish 330 gallons of Johnson NW-310 acid enhancer	76	\$ Per Gallon	\$ 110.00	\$ 8,360.00
3	Mix acid with 3,000 gallons of water and spot inject in well screen intervals	1	\$ Per 3,000 Gallons	\$3,500.00	\$ 3,500.00
4	Agitate acid for 8 hours over a 24 hour period	8	\$ Per Hour	\$ 250.00	\$ 2,000.00
5	Install combination brushing, swabbing, and pumping tool to 445'. Purge well by pumping until all acid mix is removed. Discharge purge water to a surface tank and neutralize with caustic before discharging to sewer or storm drain.	1	\$ Lump Sum	\$7,000.00	\$ 7,000.00
6	Furnish 8 bags of caustic soda to neutralize acid	8	\$ Per Bag	\$ 140.00	\$ 1,120.00
<b>TOTAL COST ESTIMATE FOR DESERT SPRINGS 2 WELL</b>					<b>\$ 28,700.00</b>

<b>DESERT SPRINGS 3 WELL REHAB</b>					
<p>The Desert Springs 3 production well was constructed with 10" blank casing and screen to a total depth of 272 feet in 1979. The screen is 3/32" x 2 1/2" mill slot screen set between 58'-288'. The contractor will: rehab the well, inspect and service the pump and pump motor, replace the pump column with a new epoxy coated and lined pump column, and equip the well for step testing, as specified below. All equipment and materials must be disinfected with bleach before placing in the well.</p>					
Item #	Activity	Scheduled Value	Unit	Unit Price	Total Price
1	Mobilization/Demobilization	1	\$ Lump Sum	\$5,000.00	\$ 5,000.00
2	Supply disinfection bleach, spray all materials and equipment used in the well.	1	\$ Lump Sum	\$ 500.00	\$ 500.00
3	Remove submersible motor. Inspect and balance rotor, and replace bearings if necessary. A TMWA electrician will unwire and rewire the motor.	1	\$ Lump Sum	\$5,800.00	\$ 5,800.00
4	Remove 6" pump column (approximate size).	220	\$ Per Foot	\$ 14.00	\$ 3,080.00
5	Inspect and service pump bowls.	1	\$ Lump Sum	\$2,800.00	\$ 2,800.00
6	Inspect and service discharge head.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
7	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
8	Provide and construct temporary discharge piping.	100	\$ Per Foot	\$ 5.00	\$ 500.00
9	Line brush the entire well to dislodge encrustations, and air-lift debris from the well.	12	\$ Per Hour	\$ 240.00	\$ 2,880.00
10	Use open-end pipe with tight-fitting single swab and airlift the well. Tag the well depth before and after air-lifting.	1	\$ Lump Sum	\$2,600.00	\$ 2,600.00
11	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
12	If directed, spot inject a total of 5,000 gallons of acid mix within the well screen interval. Estimate 5 injection batches.	1	\$ Lump Sum	\$3,500.00	\$ 3,500.00
13	Line double-swab the well screen interval to open perforations, bail debris from the bottom of the well.	12	\$ Per Hour	\$ 240.00	\$ 2,880.00
14	Supply and install an in-line pump with a 10-foot double swab with a brush at the bottom. Pump and surge develop in 10-foot intervals with 5-foot overlap within screen intervals until each section is deemed clean by onsite TMWA representative.	40	\$ Per Hour	\$ 300.00	\$ 12,000.00
15	If acid was used, purge well by pumping until all acid mix is removed. Discharge purge water to a surface tank and neutralize with caustic before discharging to sewer or storm drain.	1	\$ Lump Sum	\$5,000.00	\$ 5,000.00
16	Install test pump to 220 feet bgs. Pump shall be capable of pumping up to 500 gpm from a pumping level of 100 feet bgs.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
17	Operate, maintain, and pump the well to waste during 6 to 8-hour step test.	8	\$ Per Hour	\$ 200.00	\$ 1,600.00
18	Remove the test pump and pump column.	1	\$ Lump Sum	\$1,200.00	\$ 1,200.00
19	Run water into the well overnight and perform a video camera survey.	1	\$ Lump Sum	\$ 900.00	\$ 900.00
20	Supply and install a new epoxy-coated pump column with all the necessary appurtenances.	220	\$ Per Foot	\$ 160.00	\$ 35,200.00
21	Supply and install two 1-inch schedule 40 PVC sounding tube. The tube shall be bound to the pump column using stainless steel banding at intervals to be determined by TMWA. The tube shall have 90° elbows at the bottom terminating with 1-inch pipe plug, and a vented cap at the top.	420	\$ Per Foot	\$ 3.00	\$ 1,260.00
22	Supply a schematic of the motor, discharge head, pump, and pump column assembly, as installed.	1	\$ Lump Sum	\$ 150.00	\$ 150.00
23	Supply 20,000 gallons Baker Tank, store turbid purge water to settle out sediment, and neutralize chlorine before pumping to sewer or storm drain.	1	\$ Lump Sum	\$1,800.00	\$ 1,800.00
24	<b>TOTAL COST ESTIMATE FOR DESERT SPRINGS 3 WELL</b>				\$ 92,850.00

<b>DESERT SPRINGS 3 WELL REHAB - Acid Treatment</b>					
<p>Acid treatment, if required, shall be coordinated and formulated with the contractor. Below is an estimate of required activities to treat</p>					
Item #	Activity	Scheduled Value	Unit	Unit Price	Total Price
1	Furnish 530 gallons of 75% active Phosphoric Acid	530	\$ Per Gallon	\$ 24.00	\$ 12,720.00
2	Furnish 144 gallons of Johnson NW-310 acid enhancer	144	\$ Per Gallon	\$ 110.00	\$ 15,840.00
3	Mix acid with 7,000 gallons of water and spot inject in well screen intervals	2.33	\$ Per 3,000 Gallons	\$3,500.00	\$ 8,155.00
4	Agitate acid for 8 hours over a 24 hour period	8	\$ Per Hour	\$ 250.00	\$ 2,000.00
5	Install combination brushing, swabbing, and pumping tool to 288'. Purge well by pumping until all acid mix is removed. Discharge purge water to a surface tank and neutralize with caustic before discharging to sewer or storm drain.	1	\$ Lump Sum	\$5,000.00	\$ 5,000.00
6	Furnish 8 bags of caustic soda to neutralize acid	8	\$ Per Bag	\$ 140.00	\$ 1,120.00
	<b>TOTAL COST ESTIMATE FOR DESERT SPRINGS 3 WELL</b>				\$ 44,835.00

<b>Well House Piping Modifications Estimate</b>			
The three ASR Retrofit wells (Desert Springs 1, 2, & 3) will be modified in order to allow recharge to occur at each well. Modifications to the well house piping include additional piping, connections, valves, and meters. Included below are rough estimates of the materials required to modify each well and the estimated cost.			
Well Name	Estimated Modifications	Subtotal	Well Total
Desert Springs 1 Well	4" Sparling full port magnetic flow meter	\$ 3,500.00	
	4" 90-01 PRV	\$ 3,000.00	
	Unregulated/Recharge transducer	\$ 2,500.00	
	4" Piping, fittings, and coatings	\$ 2,500.00	\$ 11,500.00
Desert Springs 2 Well	6" Sparling full port magnetic flow meter	\$ 5,000.00	
	6" 90-01 PRV	\$ 5,000.00	
	Unregulated/Recharge transducer	\$ 2,500.00	
	6" Piping, fittings, and coatings	\$ 3,500.00	\$ 16,000.00
Desert Springs 3 Well	4" Sparling full port magnetic flow meter	\$ 3,500.00	
	6" 90-01 PRV	\$ 5,000.00	
	Unregulated/Recharge transducer	\$ 2,500.00	
	6" Piping, fittings, and coatings	\$ 3,500.00	\$ 14,500.00
<b>TOTAL COST ESTIMATE FOR PIPING MODIFICATIONS</b>			\$ 42,000.00

<b>Laboratory Analytical Estimate</b>						
18 monitoring wells and one production well near the three ASR Retrofit wells (Desert Springs 1, 2, & 3) will be monitored for						
Item #	Analyses	# of Samples	# of Quarters	Unit	Unit Price	Total Price
1	Nitrate	19	7	\$/ sample	\$ 15.00	\$ 1,995.00
2	Chloride	19	7	\$/ sample	\$ 15.00	\$ 1,995.00
4	Sulfate	19	7	\$/ sample	\$ 15.00	\$ 1,995.00
3	TDS	19	7	\$/ sample	\$ 15.00	\$ 1,995.00
5	TTHM	19	7	\$/ sample	\$ 100.00	\$ 13,300.00
Subtotal						\$ 21,280.00
10% Discount						\$ 2,128.00
<b>TOTAL COST ESTIMATE FOR ANALYTICAL SERVICES</b>						\$ 19,152.00

<b>SCADA Modifications Estimate</b>	
The SCADA (telemetry) control systems for each of the proposed ASR Retrofit	
Anticipated SCADA Modifications	Estimated Cost
Desert Springs Well 1 Control Panel	\$ 17,000
Desert Springs Well 2 Control Panel	\$ 15,000
Desert Springs Well 3 Control Panel	\$ 15,000
900 MHz radio, DAIO6, AI, AO, ant	\$ 9,000
Sixnet cell modem + simm	\$ 2,625
Wire, TBs, cable, tie-wraps	\$ 730
<b>TOTAL COST ESTIMATE FOR SCADA MODIFICATIONS</b>	\$ 59,355.00

# WETLAB

WESTERN ENVIRONMENTAL TESTING LABORATORY

Quotation for Analytical Services			
<b>Date:</b>	03/29/16	<b>Quote No.:</b>	TMWA160329
<b>Contact Person:</b>	Christian Kropf		<b>Matrix</b> DW = drinking water GW = groundwater HW = hazardous waste SL = sludge SO = soil SW = surface water WW = wastewater
<b>Client:</b>	Truckee Meadows Water Authority		
<b>Street Address:</b>	PO Box 30013		
<b>City, State, Zip:</b>	Reno, NV 89520		
<b>Telephone:</b>	(775) 834-8188		
<b>Email:</b>	ckropf@tmwa.com		
<b>Project Name:</b>	2016 Analytical Pricing		
<b>WET Lab Contact:</b>	Hollie Timmons	<b>Phone:</b>	(775) 355-0202

Requested Parameters	Method	Matrix	Quantity	Unit Price	Total Price
IOC Phase II/V	Misc	DW	1	\$275.00	\$275.00
Secondary Drinking Water Standards	Misc	DW	1	\$300.00	\$300.00
Volitile Organic Componds (VOCs)	EPA 524.2	DW	1	\$200.00	\$200.00
Total Trihalomethanes (TTHM)	EPA 524.2	DW	1	\$100.00	\$100.00
Haloacetic Acids (HAA5)	EPA 552.3	DW	1	\$180.00	\$180.00
<sup>1</sup> Total Organic Carbon		DW	1	\$66.00	\$66.00
<sup>2</sup> Metals by ICP	EPA 200.7	DW	1	\$15 per Metal	\$275.00
<sup>3</sup> Metals by ICP-MS	EPA 200.8	DW	1	\$18 per Metal	\$126.00
Mercury by Cold Vapor	EPA 245.1	GW	1	\$30.00	\$30.00
Total Cyanide	SM 4500 CNC	DW	1	\$50.00	\$50.00
WAD Cyanide	SM 4500 CNI	GW	1	\$50.00	\$50.00
pH	SM 4500H+B	DW	1	\$10.00	\$10.00
Alkalinity	SM 2320B	DW	1	\$15.00	\$15.00
Anions by IC <i>NO2, NO3, SO4, Cl, F</i>	EPA 300.0	DW	1	\$15 per Anion	\$75.00
Color	SM 2120 B	DW	1	\$55.00	\$55.00
Odor	SM 2150B	DW	1	\$50.00	\$50.00
MBAS	SM 5540C	DW	1	\$62.00	\$62.00
TDS	SM 2540C	DW	1	\$15.00	\$15.00

<b>Subtotal:</b>	\$1,934.00
<b>Adjustments: 10% Discount on In-House Work</b>	\$186.80
<b>Total Analytical Cost:</b>	\$1,747.20

WET Lab Client Services	
Sample Containers & Coolers	No charge
CoC Forms, Seals & Labels	No charge
Sampling Instructions	No charge
Preservatives	No charge
Standard Level QA/QC	No charge
Sample Disposal	No charge

475 E Greg St, #119, Sparks, NV 89431  
775-355-0202 TEL 775-355-0817 FAX



WESTERN ENVIRONMENTAL TESTING LABORATORY

**Summary of Services**

**Turnaround Time:** Standard **Shipped Via:**  
**Sample Arrival Date:** **Quote Expires:** 12/31/16

**Verbal Results:** Standard turn-around time is 10 working days from date of sample receipt.

**Hardcopy Report:** Standard turn-around time is 15 working days from date of sample receipt.

**RUSH Analyses:** Must be scheduled with the laboratory prior to sample submittal.

**Reporting:**

WET Lab maintains a policy of performing substantial quality control with all analyses. Duplicate sample analysis (10%), method blanks (matrix dependent), surrogate spike analysis (when applicable), and continuing calibration procedures as part of the methodologies performed routinely.

The report will include the Laboratory and Client ID, parameter, method reference and analytical results with units.

**COMMENTS:**

**Rush Schedule (% Surcharge):** 5-Day RUSH = 25%, 3-Day RUSH = 50%, 1 or 2 day RUSH = 100%,  
 Same Day RUSH = 200%

<sup>1</sup> Analysis to be performed by Asset Laboratories out of Las Vegas, NV.

<sup>2</sup> Quote reflects scan for all 29 common ICP metals.

<sup>3</sup> Quote reflects scan for all 7 common ICP-MS metals.

**Terms:**

Terms are 30 days from date of invoice. All discounts are void if payment is not received by WETLAB within that period. Payment for services is expected at the time of submission, unless an account has been established.

**AUTHORIZATION TO PROCEED AS QUOTED AND AGREE TO WETLAB TERMS & CONDITIONS**

**NAME:** \_\_\_\_\_

**COMPANY:** \_\_\_\_\_

**WETLAB Acceptance:** \_\_\_\_\_

475 E Greg St, #119, Sparks, NV 89431  
 775-355-0202 TEL 775-355-0817 FAX

**SUMMARY**

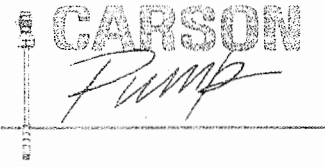
**Galletti Well Rehab  
1205B South 21<sup>st</sup> Street, Sparks, NV 89431**

The Galletti production well was constructed with 16" blank casing and screen to a depth of 260 feet in 2000. The screen is 0.125" by 2.375" louvers set at depths shown in the attached well design diagram. The contractor will rehab the well; inspect and service the pump and pump motor; replace the pump column with a new epoxy coated and lined pump column, and equip the well for step testing, as specified below. All equipment and materials must be disinfected with bleach before placing in the well.

Item #	Description	Scheduled Value	Unit	Unit Price	Total Price
1	Mobilization/Demobilization	1	LS		\$5,000.00
2	Supply disinfection bleach, spray all materials and equipment used in the well.	1	LS	\$500.00	\$ 500.00
3	Remove, dip, and bake 250 HP hollow shaft vertical motor. Inspect and balance rotor, and replace bearings if necessary. A TMWA electrician will unwire and rewire the motor.	1	LS		\$5,800.00
4	Remove 10"x 2.5"x1-11/16" pump column, tube, and shaft (approximate sizes).	150	Per Foot	14/ft	\$2,100.00
5	Inspect and service pump bowls.	1	LS		\$2,800.00
6	Inspect and service discharge head.	1	LS		\$1,200.00
7	Run water into the well overnight and perform a video camera survey.	1	LS		\$ 900.00
8	Provide and construct temporary discharge piping.	100	Per Foot	5/ft	\$ 500.00
9	Line brush the entire well to dislodge encrustations, and air-lift debris from the well.	12	Per Hour	240/ft	\$2,880.00
10	Use open-end pipe with tight-fitting single swab and airlift the well. Tag the well depth before and after air-lifting.	1	LS		\$2,600.00
11	Run water into the well overnight and perform a video camera survey.	1	LS		\$ 900.00
12	If directed, spot inject a total of 5,000 gallons of acid mix within the well screen interval. Estimate 5 injection batches.	1	LS		\$3,500.00

BID SCHEDULES  
(Cont)

13	Line double-swab the well screen interval to open perforations, bail debris from the bottom of the well.	10	Per Hour	240/hr	\$2,400.00
14	Supply and install an in-line pump with a 10-foot double swab with a brush at the bottom. Pump and surge develop in 10-foot intervals with 5-foot overlap within screen intervals until each section is deemed clean by onsite TMWA representative.	20	Per Hour	300/hr	\$6,000.00
15	If acid was used, purge well by pumping until all acid mix is removed. Discharge purge water to a surface tank and neutralize with caustic before discharging to sewer or storm drain.	1	LS		\$5,000.00
16	Install test pump to 120 feet bgs. Pump shall be capable of pumping up to 2000 gpm from a pumping level of 115 feet bgs.	1	LS		\$1,200.00
17	Operate, maintain, and pump the well to waste during 6 to 8-hour step test.	8	Per Hour	200/hr	\$1,600.00
18	Remove the test pump and pump column.	1	LS		\$1,200.00
19	Run water into the well overnight and perform a video camera survey.	1	LS		\$ 900.00
20	Supply and install a new epoxy-coated and lined water lubed, 10"x1-11/16" pump column and shaft with all the necessary shaft sleeves, and bearing retainers.	155	Per Foot	160/ft	\$24,800.00
21	Supply and install two 1-inch schedule 40 PVC sounding tube. The tube shall be bound to the pump column using stainless steel banding at intervals to be determined by TMWA. The tube shall have 90° elbows at the bottom terminating with 1-inch pipe plug, and a vented cap at the top.	300	Per Foot	3/ft	\$ 900.00
22	Supply a schematic of the motor, discharge head, pump, and pump column assembly, as installed.	1	LS		\$ 150.00
23	Supply 20,000 gallons Baker Tank, store turbid purge water to settle out sediment, and neutralize chlorine before pumping to sewer or storm drain.	1	LS		\$1,800.00
<b>GALLETI WELL REHAB BID PRICE</b>					<b>\$74,630.00</b>



P.O. Box 20159  
Carson City, NV 89721-0159

Date	Estimate #
2/6/2016	1697

NV. Lic #39920A  
CA. Lic #745270

Name / Address
TMWA Att: Randy Van Hooser

Project
Galetti Way Well

Description	Qty	Cost	Total
Furnish 220 gallons of 75% active Phosphoric acid	220	24.00	5,280.00
Furnish 60 gallons of Johnson NW-310 acid enhancer	60	110.00	6,600.00
Mix acid with 3,000 gallons of water and inject in screen zones (from original bid schedule item #12)	1	3,500.00	3,500.00
Agitate acid for 4 hrs. over a 24 hr. period	4	250.00	1,000.00
Install combination brushing, swabbing and pumping tool to 240', pump acid to tank, treat with caustic soda to neutralize ( from original bid schedule item #15)	1	5,000.00	5,000.00
Furnish 8 bags of Caustic soda to neutralize acid	8	140.00	1,120.00

Thank you for considering Carson Pump for this proposal	<b>Subtotal</b>	\$22,500.00
	<b>Sales Tax (7.1%)</b>	\$0.00
	<b>Total</b>	\$22,500.00



P.O. Box 20159  
Carson City, NV 89721-0159

Date	Estimate #
2/6/2016	1698

NV. Lic #39920A  
CA. Lic #745270

Name / Address
TMWA Att: Randy Van Hooser

Description	Qty	Project	
		Cost	Total
Galetti Way Well			
Furnish 4 gallons of Johnson NW-410 chlorine enhancer	4	120.00	480.00
Furnish 5 gallons of Johnson NW-220 mud dispersant	5	110.00	550.00
Furnish 4 gallons of Johnson NW-400 non-ionic surfactant	4	100.00	400.00
Furnish 10 gallons of 12% sodium hypochlorite	10	10.00	100.00
Mix chemicals with 4,000 gallons of water and inject and swab into screen zones	1	3,500.00	3,500.00
Line swab chemical in well for 2 hrs.	2	250.00	500.00
Install combination, pumping, swabbing and brushing tool to 240' , pump chemical to tank and treat with sodium thiosulfate	1	5,000.00	5,000.00
Thank you for considering Carson Pump for this proposal		<b>Subtotal</b>	\$10,530.00
		<b>Sales Tax (7.1%)</b>	\$0.00
		<b>Total</b>	\$10,530.00



Manufacturer of Inflatable Packers, Testing Tools, ASR Valves and other products for investigating, controlling and producing the **EARTH'S FLUIDS™**  
 Phone: (303) 789-1200 • (800) 55-Baski • Fax: (303) 789-0900  
 Email: sales@baski.com • Website: www.baski.com



Date: April 11, 2016

Pages: 8 (including Cover Page)

**To:** Christian Kropf  
 Truckee Meadows Water Authority

**Phone #:** (775) 834-8016      **Email:** ckropf@tmwa.com

**From:** Nick Hemenway, Engineering  
 Baski, Inc.

**RE:** Patented<sup>1</sup> downhole Flow Control Valve (FCV™)  
 Truckee Meadows Wells SSV DS1, DS2 and DS3

Dear Mr. Kropf,

Thank you for the opportunity to present our equipment for your review. The following quotation (Quote# 33755) is based on the information you have supplied us via the FCV worksheets and email discussion.

Included in this quotation is a listing of equipment and services we propose to supply and a partial listing of what we will not supply.

Our warranty is enclosed on page 5, and drawings of the FCV™, and control panel follow.

<sup>1</sup>USA Pat. 5,316,081; 6,273,195

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We propose to provide the following equipment **for each well**:

**Flow Control Valve**

- 1) **Well SSV DS1**-One Baski patented<sup>1</sup> Flow Control Valve (FCV™); Model FCV-6.63-3.0-4.5-316SS (4" nominal column pipe), see drawing 'injection\_33755-1'. The overall length is 96". Baski will thread the FCV™ with threads to match the column pipe.

**Wells SSV DS2 and SSV DS3**-One Baski patented<sup>1</sup> Flow Control Valve (FCV™); Model FCV-8.63-4.5-6.63-316SS (6" nominal column pipe), see drawing 'injection\_33755-2'. The overall length is 120". Baski will thread the FCV™ with threads to match the column pipe.

**2 Control Lines to the FCV™**

- 2) Each Flow Control Valve has two control lines, running from the control panel to the ports on the top of the Flow Control Valve. These stainless steel tubes are Duplex 2205, 1/4" OD, and hydrostatic tested to 15,000 psi. The control panel is assumed to be within 50 feet of the wellhead.

**Control Panel and Nitrogen Regulator**

- 3) One control panel for manual or SCADA-controlled automatic operation, with a mechanical pressure gauge (dwg 24362) is supplied. The control panel allows a single person to manually operate the valve. The control panel valves are brass, with soft seats for positive shutoff. The blocks are aluminum. The control panel valves, blocks and gauges are mounted to a NEMA back panel for attachment to a wall or in an enclosure (not supplied). A nitrogen regulator will also be supplied.

**Field Services**

- 4) Up to four trips to the field by a Baski representative; up to two 8-hour days on site for installation for each valve, and up to two 8-hour days on site for start-up and training. While on site, the Baski representative would act only in an advisory capacity. Conditions causing unsatisfactory operation, or inability to operate the Flow Control Valve, which are not associated with the Flow Control Valve itself, shall relieve manufacturer of any extra on-site / on-call duties. The Contractor must request and schedule these on-site services at least 7 full calendar days in advance. It is the Contractor's responsibility to have nitrogen on site for these services.

**Specific equipment and services not supplied includes, but not limited to, the following:**

- Pumps, column piping (unless order as an additional line item), and water meters
- PLC controller / SCADA system; hardware, software, and testing
- Transmitters and/or transducers, their cable and dataloggers, either uphole or downhole
- Installation of the FCV™, control lines, and control panel
- Enclosure for the Control Panel
- Conduits or other protective enclosure for the control lines from the well head to the control panel
- Well head seals for the control lines coming out of the well
- Nitrogen cylinders
- Downhole Check Valves

**Pricing and Payment Terms**

Unit Pricing for items 1, 2 and 3 is \$50,000 for Well SSV DS1 and \$55,000 for Well SSV DS2 and SSV DS3 (total of \$160,000 for all three wells). Pricing is lump sum and is FOB Destination. Before we start work on this made to order equipment, we would need to review and accept your purchase order (PO) and its terms and conditions; get approval of our submittal (if necessary) and receive a non-refundable payment equal to 25% of the total PO. After we start work, we estimate that we can have the equipment ready to ship in 2-3 months. When the equipment is ready to ship, the remaining 75% of the balance is due. Before shipment, the balance of the invoice must be paid.

All schematics are for conceptual purposes and do not necessarily represent the exact design details of equipment which will be supplied. This pricing is based upon the terms and conditions, equipment, and/or services, of this quotation. Other terms, conditions, equipment, and/or services required by Buyer may be cause for withdrawal of this quotation, which is an Offer for Sale. Pricing is valid for 120 days.

Thank you for the opportunity to present our equipment for your review. If you have any questions, please feel free to give me a call or email me.

Sincerely,  
Nick Hemenway

NCH encl Warranty, p. 5 of 8; and drawings injection\_33755-1, injection\_33755-2, 24362

NV0024031

**NEVADA DIVISION OF ENVIRONMENTAL PROTECTION**

**AUTHORIZATION TO DISCHARGE**

In compliance with the provisions of the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251 et. seq.; the "Act") and Chapter 445A of the Nevada Revised Statutes, the Permittee,

**Truckee Meadows Water Authority (TMWA)  
PO Box 30013  
Reno, NV 89520**

is authorized to discharge surface water and groundwater generated during various TMWA system operations, maintenance and emergency activities. Discharge is directed to groundwater, surface water, or stormdrain systems, located within the City of Reno, City of Sparks or unincorporated Washoe County, with system extents defined by the following coordinates:

**Northern Extent: Latitude 39° 40' 59.07" N, Longitude 119° 53' 53.01" W  
Section 18, T21N R19E MDB&M**  
**Southern Extent: Latitude 39° 24' 40.56" N, Longitude 119° 46' 13.68" W  
Section 20, T18N R20E MDB&M**  
**Western Extent: Latitude 39° 31' 17.57" N, Longitude 119° 57' 37.63" W  
Section 09, T19N R18E MDB&M**  
**Eastern Extent: Latitude 39° 37' 22.70" N, Longitude 119° 39' 44.15" W  
Section 06, T20N R21E MDB&M**

to receiving waters named:

**Waters of the State, including the Truckee River and its tributaries**

in accordance with discharge limitations, monitoring requirements, and other conditions set forth in Parts I, II, and III hereof.

This permit shall become effective on August 31, 2011.

This permit shall expire at midnight August 30, 2016.

Signed this 30<sup>th</sup> day of August, 2011.

\_\_\_\_\_  
Jeryl R. Gardner, P.E.  
Bureau of Water Pollution Control





NEVADA DIVISION OF  
**ENVIRONMENTAL  
 PROTECTION**

November 9, 2015

John A. Erwin  
 Truckee Meadows Water Authority  
 P.O. Box 30013  
 Reno, NV 89510

RE: Underground Injection Control (UIC) Permit UNEV2009202  
 Major Modification – Increase Number of Permitted Wells  
 Spanish Springs Valley – Basin 85 Recharge

Mr. Erwin:

The Nevada Division of Environmental Protection (NDEP) has completed the modification of UIC permit UNEV2009202 to include additional wells in the Spanish Springs area. Enclosed is a signed copy of the final renewed permit. Please review the permit carefully, and ensure all monitoring, recordkeeping, and sampling requirements are verified and updated. Note all specific monitoring and sampling requirements can now be found in the back of the permit under Attachment 1.

Please mail all UIC reports to the address found in the permit in the future to make sure it is processed correctly: *Nevada Division of Environmental Protection Bureau of Water Pollution Control Attn: Injection Monitoring Report 901 S. Stewart Street, Suite 4001 Carson City, NV 89701*

Note the following changes to the permit:

1. The number of permitted injection wells have been changed from one (1) to nine (9).
2. Attachment 2 has been updated.
3. Changed chlorine residual from limit from 4 to 2.5 mg/L.
4. Reporting is on an annual basis, not semi-annual – due February 15<sup>th</sup> of each year.
5. Under Part I.B.3, an updated UIC O&M manual is due by March 31, 2016. This manual should primarily focus on procedures related to ASR activities and monitoring/sampling related to UIC permit.

If you have any specific concerns or comments regarding this issued permit, you will need to submit those in writing. Contact me with any questions at 775-687-9428 or [rland@ndep.nv.gov](mailto:rland@ndep.nv.gov).

Sincerely,

Russ Land  
 Bureau of Water Pollution Control

Enclosure: copy – modified UIC permit UNEV2009202

ecc: Cliff Lawson P.E., Supervisor NDEP BWPC  
 Christian Kropf, TMWA  
 Nick Brothers, NDEP BWPC Compliance Branch  
 cc: File UNEV2009202  
 Reader File

STATE OF NEVADA  
DIVISION OF ENVIRONMENTAL PROTECTION

**Authorization To Inject**

In compliance with the provisions of the Nevada Revised Statutes (NRS 445A) and the Nevada Underground Injection Control Regulations (NAC 445A.810 thru 445A.925), the following Permittee is authorized to dispose from a facility described below in accordance with limitations, requirements and other conditions set forth in Parts I and II hereof.

Permit Number: **UNEV2009202**  
Facility Name: **Spanish Springs Valley Aquifer Storage and Recovery (ASR) Project**  
Facility Address: **various locations around Spanish Springs Valley, Washoe County**  
Permittee: **Truckee Meadows Water Authority (TMWA)**  
Permittee Address: **1355 Capital Blvd., PO Box 30013 Reno, Nevada**  
Property Owner: **TMWA**  
Owner Address: **1355 Capital Blvd. Reno, Nevada**  
Legal Description: **Section 3 T20N, R20E, Sections 6 & 7 T20N R21E and Section 34 T21N R 20E MDB&M Washoe County, Nevada**  
Number of Permitted Wells: **Nine (9)** **subclass 5R33**  
Other Permits: **NDWR permit – R-019**  
Annual Fee Due: **July 1<sup>st</sup> of each year**  
Reporting Frequency: **Annually** (see Part I.A.6)

**Facility Description**

The injection wells are located in Spanish Springs Valley. Existing production wells used to store and recover treated water from the Truckee River during the non-production months of the year (fall through spring).

Any additional wells to be added to this permit or exchanged for the above well shall require approval through the UIC Program, and public notice.

NOTE: Reference the permit fact sheet for specific details on the facility and wells, and permit history.

Permit issued as temporary permit on: **December 10, 2008**  
Permit modified on November 9, 2015  
This permit shall become effective: November 9, 2015  
This permit shall expire at midnight: November 9, 2020

  
\_\_\_\_\_  
Russ Land  
Bureau of Water Pollution Control

11-9-15  
Date

**TRUCKEE MEADOWS WATER AUTHORITY**

**RESOLUTION NO. 239**

**A RESOLUTION APPROVING THE GRANT APPLICATION TO THE BUREAU OF RECLAMATION TO DEVELOP A WATER AND ENERGY EFFICIENCY GRANT FOR MUNICIPAL WELL AQUIFER STORAGE AND RECOVERY RETROFIT PROJECT**

**WHEREAS**, the U.S. Bureau of Reclamation (USBR) has established the WaterSMART Program to provide federal assistance to water authorities in the areas of water efficiency, and to integrate water and energy policies to support the sustainable use of all natural resources.

**WHEREAS**, in April of 2016, the Truckee Meadows Water Authority (TMWA or Authority) applied for the USBR's WaterSMART Drought Resiliency funding opportunity for FY 2016. Under the federal funding, TMWA proposed a project titled "Municipal Well Aquifer Storage and Recovery Retrofit Project" for drought resiliency.

**WHEREAS**, TMWA desires to move forward with a proposal ("Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal") in order to equip three wells in Spanish Springs Valley with aquifer storage and recovery (ASR) capabilities.

**WHEREAS**, the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal seeks a total award of \$300,000, with a \$490,240 in-kind match by TMWA.

**WHEREAS**, the Board believes the submittal of the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal and providing an in-kind match if awarded the grant is in the best interests of Authority and is appropriate and justified.

**NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE TRUCKEE MEADOWS WATER AUTHORITY DOES RESOLVE:**

1. The Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal has been reviewed and approved by the Board and the Board supports and believes pursuing the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal is in the best interests of the Authority.

2. The General Manager is authorized to submit the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal and is authorized to commit the Authority to the financial and legal obligations associated with the receipt of the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal, including an in-kind match, if approved.

Truckee Meadows Water Authority  
Resolution No. 239 continued

3. The Authority is financially capable of providing the funding or in-kind contributions specified in the funding plan for the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal, as identified in the Authority staff report.

4. The General Manager is authorized to work with the BOR to meet established guidelines for entering into a cooperative financial assistance agreement in connection with the Municipal Well Aquifer Storage and Recovery Retrofit Project Proposal.

Upon motion of \_\_\_\_\_, seconded by \_\_\_\_\_, the foregoing Resolution was passed and adopted this 20<sup>th</sup> day of April, 2016, by the following vote of the Board:

Ayes: \_\_\_\_\_

Nays: \_\_\_\_\_

Abstain: \_\_\_\_\_ Absent: \_\_\_\_\_

Approved this 20<sup>th</sup> day of April, 2016

\_\_\_\_\_  
Geno Martini, Chairman

STATE OF NEVADA,        )  
  : ss.  
COUNTY OF WASHOE.    )

On this 20<sup>th</sup> day of April, 2016, Geno Martini, Chairman of the Board of Truckee Meadows Water Authority, personally appeared before me, a Notary Public in and for said County and State, and acknowledged that he executed the above instrument freely and voluntarily and for the purposes therein mentioned.

\_\_\_\_\_  
Notary Public