Attachment **4. Project Description**

This project proposes to select locations, install and monitor three new depth-discreet monitoring wells in the Martis Valley Groundwater basin. The new wells proposed by this project will meet the requirements that have been established for inclusion in the Martis Valley Groundwater Monitoring Program and will supplement data being compiled for the updated Martis Valley Groundwater Management Plan. This Monitoring Program combines efforts to satisfy the local and state requirements for a monitored groundwater basin where semi-annual monitoring began in the spring 2012 by the Martis Valley Partners - Placer County Water Agency (PCWA), Truckee-Donner Public Utilities District (TDPUD), and Northstar Community Services District (NCSD).

Background

The Martis Valley groundwater basin is identified as Basin 6-67 in the North Lahontan Hydrologic Region as described in DWR Bulletin 118. The Truckee River crosses the basin from south to east in a shallow, incised channel. Principal tributaries to the Truckee River are Donner Creek, Martis Creek, and Prosser Creek. Major surface water storage reservoirs include Donner Lake, Martis Creek Lake, and Prosser Creek Reservoir. The Martis Valley groundwater basin is shown below in Figure 1.

The Martis Valley has an approved Groundwater Management Plan (GMP) that is being updated to meet the requirements set by SB 1938 and addresses the voluntary and recommended components included in AB 3030 and recommended in Bulletin 118-2003. The addition of monitoring wells proposed by this project support the GMP goal of helping to ensure long term quality and availability of groundwater in the Martis Groundwater Basin. The GMP identifies a number of key issues that must be addressed in order to sustainably manage groundwater resources for the long-term. These issues include the identification of sources of recharge and the protection of recharge areas, and the long-term evaluation of changes in groundwater elevations that affect groundwater storage. This project will help address these issues.

Project Description

There are a limited number of wells available to monitor the Martis Valley basin; three of which are currently monitored by the TDPUD and 2 are monitored by the DWR (see Figure 1 attached). However, the number of active wells currently monitored has decreased by over 25% since 1993, which considering the very complex geologic and hydrogeologic structure, additional depth-discreet wells are required. This project proposes to install three new monitoring wells, designed to discreetly monitor shallow groundwater, to improve the coverage of groundwater elevation data points that are available to the Martis Valley basin monitoring program. The new wells will 1) to develop better basin coverage of groundwater gradients, 2) to improve understanding of seasonal and long term groundwater elevation trends, and 3) identify sources of recharge and the protection of recharge areas. In addition, the wells will be located strategically to address some specific technical issues that will improve key areas of understanding of the Martis Valley basin as well as significantly improve future calibration efforts for the companion Martis Valley groundwater model associated with the GMP. The key areas include:

- A location(s) to improve the understanding of the interaction of groundwater and surface water. A key target will be locations that are between surface water bodies/recharge zones and significant pumping centers. Many current monitoring wells are located too near pumping centers to help understand critical groundwater surface water interaction.

- A location(s) that will fill a data gap(s) in key parts to the basin that will be difficult to calibrate in the groundwater model being developed for the basin. Of special note is the southeastern perimeter of the basin in the NCSD.
- Locations that can provide samples for isotopic signatures of the groundwater (oxygen and deuterium ratios) to improve the understand sources of recharge from various areas around the basin.

This study will consist of 5 primary components:

1. Conduct a siting study to locate depth-discreet three monitoring well on property currently owned by NCSD, PCWA, and TDPUD. The study will include evaluating prospective locations for: proximity to other monitoring program wells, proximity to surface water and recharge areas, proximity to pumping centers, nearest power supply, depth to groundwater, depth of groundwater basin, ability to survey the ground elevation and reference point elevation of the well, and site accessibility. The proposed locations and proposed well specifications will be presented to the established Martis Valley GMP Stakeholder Working Group (SWG).
2. Once the prospective locations have been selected, the technical team will permit the wells, and complete CEQA documentation.
3. Once permitted, the wells will be drilled, installed, and developed. Each well will be installed using mud rotary or air rotary techniques. Cuttings from the borehole drilling will be logged for stratigraphy and lithology.
4. Groundwater elevations and groundwater quality samples will be collected once the wells are properly developed. Groundwater elevations will be measured in each will for inclusion in basin groundwater elevation monitoring program. In addition, each well will be sampled once for a full suite of groundwater chemical parameters and for stable isotope analysis.
5. A report will be prepared to summarize and document field work and analytical data.

The data collected from the 2013 Study will result in:

- Detailed stratigraphic data to expand the understanding of shallow basin stratigraphy in three new areas. These data will be interpreted by a California certified hydrogeologist and incorporated into the basin conceptual model;
- Water level elevations will be provided from new areas to assess groundwater surface water interaction, and recharge in the southeastern portion of the basin;
- General chemistry data and isotope data from all three wells will provide data on potential recharge sources for the areas of the in the study;
- Three new depth-discreet monitored long-term points will be available for inclusion in the basin groundwater monitoring program. The elevation data gathered as part of this program will be included as part of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program.

The methods used to install the wells, perform the sampling, and collect data are consistent with those used as part of on-going groundwater monitoring and evaluations in the Martis Valley basin. These data will be compiled and interpreted by a California certified hydrogeologist to evaluate the state of groundwater flow and the ability of the Martis Valley sub basin aquifers to meet the demands of the stakeholder agencies.

The project results will be made available to the public and associated stakeholder through the use of the Martis Valley Groundwater Management Plan project website. The website will allow for public access to quarterly reports produced during implementation of the project as well as other project documentation such as California Environmental Quality Act (CEQA) documentation, work plans, permits, project data, previous study results and current study results.

This project will use the Stakeholder Working Group (SWG) established for the Martis Valley GMP to guide and provide technical comment to the project. The committee consists of representatives of DWR, the three stakeholder agencies (TDPUD, NCSD, and PCWA), and the Bureau of Reclamation who is funding the groundwater model. The SWG will serve to assure the project remains on task and is performing in a manner consistent with this application and for the betterment of understanding of the aquifer and beneficial use of water of the state.

Relevance to the GMP

Basin Management Objectives (BMOs) described in the GMP provide specific direction for the protection of Martis Valley sub basin groundwater. Each BMO identifies a distinct portion of the overarching goal as its focus. There are five primary areas emphasized in the GMP that are summarized below along with this study's contribution to helping achieve the BMO.

- **Manage groundwater to maintain established beneficial groundwater uses.** The Martis Valley Groundwater Basin is the primary source of water to multiple users under separate jurisdictions. This objective encourages the partnership agencies to pursue management of groundwater that is within their jurisdiction in order to protect existing uses. Project Relevance: this project teams the resources of the three water purveyors to improve basin wide understanding and data.
- **Manage groundwater use within the provisions of the Truckee River Operating Agreement.** There are provisions in TROA that apply to groundwater and water wells within the Truckee River Basin (which includes the Martis Valley) to address potential adverse impacts to surface water. Project Relevance: the depth-discreet wells installed for this project will target improved data to understand groundwater and surface water interaction in the Martis Valley basin.
- **Collaborate and cooperate with groundwater users and stakeholders in the Martis Groundwater Basin.** This objective encourages the partnership agencies to reach out to other groundwater users within the Martis Valley Groundwater Basin. Project Relevance: TDPUD, NCSD, and PCWA have collaborated to propose this project and will all provide resources to help it succeed.
- **Protect groundwater supply and quality and protect against inelastic land subsidence.** Improving the understanding of the regional supplies is a critical step in protecting and sustaining the Martis Valley groundwater supply. Project relevance: this project will expand the basin monitoring well network in key geographical areas.
- **Pursue and use the best available science and technology to inform the decision making process.** This objective encourages the partnership agencies to take actions that work with the best available science to help make informed agency decisions. Project relevance: the new wells will improve groundwater model calibration and help improve understanding of recharge areas through the use of isotope analysis.

On-going Funding

On-going monitoring of the three new wells will be conducted by PCWA, TDPUD and NCSD. A goal of the study is to install one well on each of the agencies' property. After the completion of this project, PCWA, NCSD, and TDPUD will each take responsibility to conduct semi-annual water level monitoring of their respective well and provide the data through the CASGEM program adminstrator to DWR through the CASGEM database system.

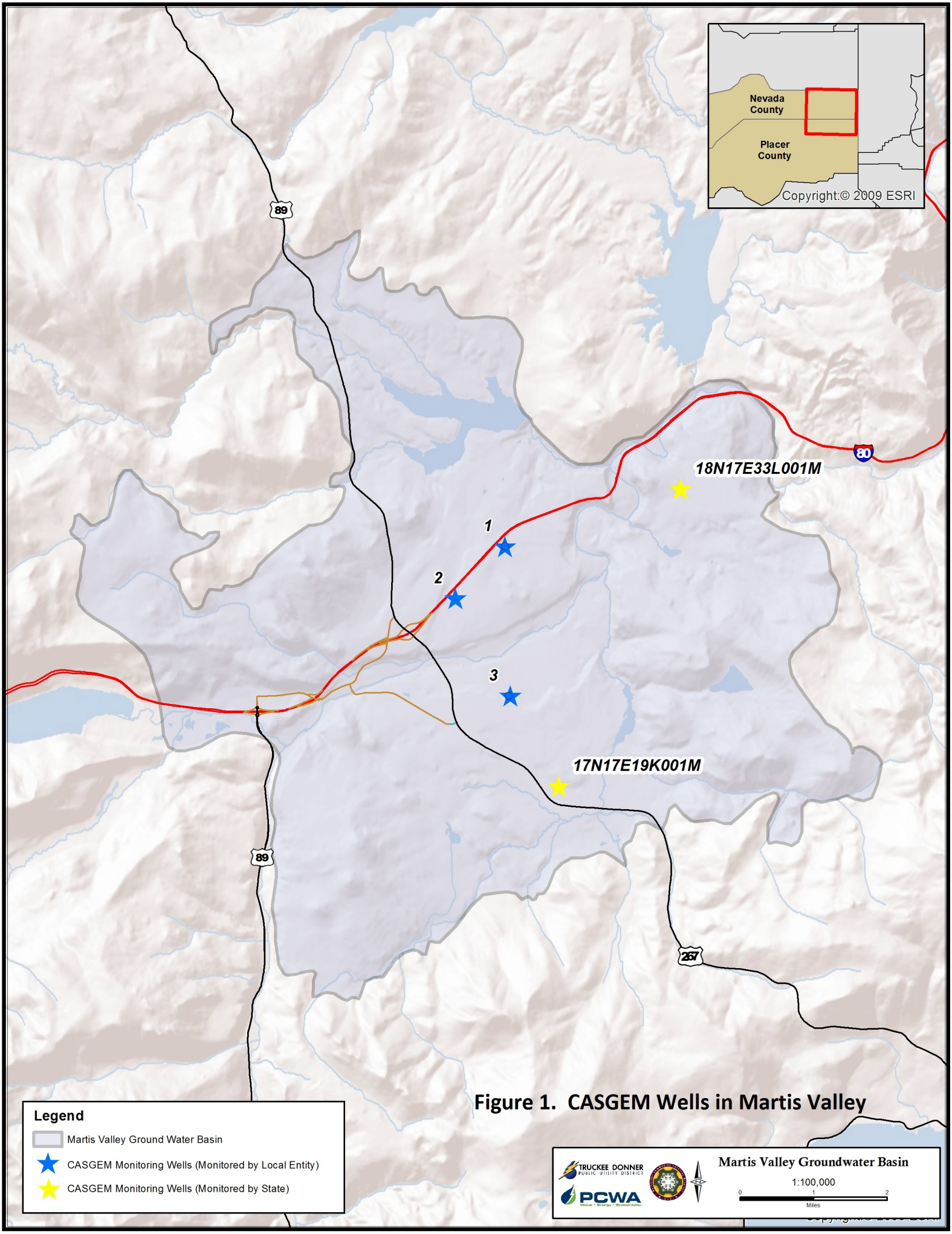

Figure 1. CASGEM Wells in Martis Valley