

2023 Final Technical Report
Submitted by the Presidio County Underground Water Conservation District (PCUWCD)
Under the USGS National Ground-Water Monitoring Network Cooperative Agreement

Award Number	G21AC10406-00
Agency Name	Presidio County Underground Water Conservation District
Title	PCUWCD seeks funding to become a data provider to the USGS NGWMN
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PROJECT SUMMARY

The PCUWCD has been working to become a data provider under Objective 1 and Objective 2A. This will enable us to expand our monitoring system, secure our data services, provide valuable data to USGS and our local decision-makers, and maintain and update those services. We projected that it would take one year to achieve Objective 1, and one year to achieve Objective 2A.

GENERAL DESCRIPTION

Very soon after the PCUWCD received the grant award, then-General Manager Carolyn Macartney corresponded with USGS and the decision was made to include the Macguire Ranch well in lieu of the Plata Siding well listed in the original proposal. She then resigned suddenly in July of 2021 and notified USGS of her departure. Board Chairman Trey Gerfers also contacted Grant Specialist Sara Roser to inform her that the district would continue to pursue the project with Mr. Gerfers as Principal Investigator.

In the fall of 2021, then-Data Specialist Dan Shiman and Principal Investigator Trey Gerfers met with USGS staff Darryl Pope, Candice Hopkins, and others to begin selecting and classifying the wells under Objective 1 of this project. During the same period, Mr. Shiman met with technical staff from USGS and from our software consultant (Halff Associates) to begin developing the architecture necessary for the district's data management system to communicate with the USGS National Ground-water Monitoring Network under Objective 2A of this project.

The district successfully created an ASAP.gov account and obtained the funding for the project on or around March 2, 2022. Mr. Shiman, USGS technical staff, and Halff Associates continued to work together in the ensuing months to achieve Objective 2A, while Mr. Gerfers worked with the district's field technicians, Blake Neffendorf and Charles Crawford, to set up the district's network of monitoring wells under Objective 1.

DESCRIPTION OF EXISTING WATER-LEVEL NETWORK

The PCUWCD's existing water-level network was created under the 2021 grant award to provide valuable data to our local decision-makers and USGS, and includes the following four wells:

El Paso Antelope Valley Ranch (Rio Grande Aquifer System) (PCUWCD:PR-000042)
Sauceda (Rio Grande Aquifer System) (PCUWCD:PR-000923)
Loma Paloma (Rio Grande Aquifer System) (PCUWCD:PR-000666)
Macguire Ranch (Igneous Aquifer) (PCUWCD:PR-000885)

DESCRIPTION OF SITE SELECTION CRITERIA AND PROCESS

As mentioned above, then-Data Specialist Dan Shiman and Principal Investigator Trey Gerfers met with USGS staff Darryl Pope and Candice Hopkins to select and classify the wells under Objective 1 of this project according to USGS criteria. The wells were all classified as Trend wells in the Background conditions subnetwork per the NGWMN Monitoring Categories Tip Sheet.

DESCRIPTION OF FIELD TECHNIQUES FOR WATER-LEVEL MEASUREMENT

Water-level measurements are collected through the installation of continuous water-level monitoring equipment. Following an initial visit to inspect the site conditions around the well, measure the static water level in the well, and photograph the well head and well site, Principal Investigator Trey Gerfers ordered the continuous water-level monitoring equipment from OTT Hydromet.

PCUWCD installed the ecolog1000 by OTT Hydromet at two of the sites under the 2021 grant award (PR-000666 and PR-000885). These two sites are non-telemetered sites and their water-level monitoring systems are equipped with a Verizon cellular chip to transmit the data via a cellular connection to the district's ftp site and data management software.

The monitoring system had to be removed from one of these sites (PR-000885) because the ranch where the well was located was sold and the new owner requested that the monitoring equipment be removed. The loss of this site is not considered detrimental to the district's monitoring efforts because PCUWCD has begun monitoring nearby sites in the same aquifer, including PR-000934 (5148616 - Section House) and PR-000169 (5148604 - Marfa Municipal Well #5). PCUWCD is adding these sites to the NGWMN with funding from its 2023 grant award.

The third of the district's monitoring sites under the 2021 grant award is a telemetered site (PR-000923) that is equipped with a Sutron XLink 500 system. This system includes a satellite antenna that transmits the data to the district's ftp site and data management software via an iridium satellite data subscription.

The district's fourth monitoring site under the 2021 grant award (PCUWCD:PR-000042) is jointly administered with the Texas Water Development Board and is equipped with a system installed by TWDB. PCUWCD will replace this system with a new continuous water-level monitoring system with funding from its 2023 grant award.

DESCRIPTION OF DATA MANAGEMENT PROCEDURES IN PLACE

Under PCUWCD's 2021 grant award to become a data provider to the NGWMN, PCUWCD worked with Halff to develop an API base code for API web services to return database well data from the district's Halff data management system to the NGWMN. As PCUWCD began experiencing high staff turnover rates over the ensuing 2 years, the shortcomings of the district's heavy reliance on manual data entry into the Halff system became glaringly apparent. In order to address this issue, Dr. Kevin Urbanczyk, the current PCUWCD data specialist, created a script to read the data from the district's monitored wells, which are transmitted on a daily basis either via a cellular connection or via an Iridium satellite transmission. The script is

designed to read these data on an approximately weekly basis. The script compiles the data into an existing archive as well as into a single file that includes only the data since the last download. This file comprises fields for the district well ID, date, time, and water level. The district pursued this script-based approach in the hope that this digital processing application will remedy past issues associated with staff turnover.

The district then worked with Halff to create a bulk upload tool within the data management software to automate the process for uploading these files on the same weekly basis. These uploads occur only after the data specialist has reviewed the data and confirmed that they are ready for publication. Another feature of the script is the generation of a weekly hydrograph for each monitored well that is emailed every week automatically to the well owner(s). This feature has proven very popular, and it is hoped that the district's well monitoring efforts will gain wider acceptance among landowners (a concerned, but conservative lot) as news of this feature spreads.

The water levels in all wells are also checked at least twice annually with an e-line, and those values are compared to the corresponding well's water-level data.

MINIMUM DATA ELEMENTS

The minimum data elements include water-level, well construction data, and lithology. These data are entered directly into the NGWMN well registry per the NGWMN Well Registry Tip Sheet. The water-level, well construction data, and lithology data are also stored in the PCUWCD database.

DESCRIPTION OF THE WORK ACCOMPLISHED UNDER OBJECTIVE 1

The four wells covered under the 2021 grant award, including:

El Paso Antelope Valley Ranch (Rio Grande Aquifer System) (PCUWCD:PR-000042)
Sauceda (Rio Grande Aquifer System) (PCUWCD:PR-000923)
Loma Paloma (Rio Grande Aquifer System) (PCUWCD:PR-000666)
Macguire Ranch (Igneous Aquifer) (PCUWCD:PR-000885)

have all been selected and classified into Subnetworks and Monitoring Categories in the USGS system.

DESCRIPTION OF THE WORK ACCOMPLISHED UNDER OBJECTIVE 2A

The API service needed for USGS is in place and development has completed. The API provides the 3 required queries: Water Level, Construction, and Lithology. These queries pull data from the same database that serves <https://presidiocountywcd.halff.com>, so any changes made there will be immediately reflected in the API. The queries can currently return data for four wells: Antelope Valley, Loma Paloma, Macguire Ranch, and Sauceda.

Any requested data that do not exist will return as "Unknown."

CONCLUSION

The district is pleased to have completed this straightforward project on time, despite the many staffing challenges. The district will continue to work with USGS under its 2023 grant award, other funding sources, and our local landowners to expand monitoring efforts to further deepen our understanding of the health of our region's aquifers and provide these valuable data to the National Ground-Water Monitoring Network.