COVER PAGE

AWARD NUMBER: G19AC00274

SPONSORING ORGANIZATION: Utah Geological Survey

PROJECT TITLE: Request for Funding by the Utah Geological Survey for Maintaining Existing Wells to the National Ground-Water Monitoring Network

CONTACT PERSON: Janae Wallace **TITLE:** Senior Scientist

ADDRESS: 1594 West Temple, Suite 3110 Salt Lake City, UT 84116

PHONE: (801) 537-3387 **FAX:** (801) 537-3400

EMAIL: janaewallace@utah.gov

CONTACT PERSON 2: Jodi Patterson **TITLE:** UGS Financial Manager

ADDRESS: 1594 West Temple, Suite 3110 Salt Lake City, UT 84116

PHONE: (801) 537-3310 **FAX:** (801) 537-3400

EMAIL: jpatters@utah.gov

TERM COVERED: November 15, 2019, to November 14, 2020

MAJOR GOALS: Objective 4. Servicing wells: Well maintenance

PROJECT SUMMARY: The Utah Geological Survey (UGS) received funding to maintain wells to ensure a continuation of data flow from select sites to the National Ground-Water Monitoring Network. We performed well maintenance from our Snake Valley Water-Level monitoring network, Castle Valley monitoring network, and wells in the Uinta Basin. The total funding available for this project was $21,529.77 with 50% match from UGS.

OVERVIEW OF WORK

The Utah Geological Survey (UGS) cooperated with the USGS to provide a continued connection between the UGS Water-Quality Network and the NGWMN, providing the NGWMN with selected sites and related quality-controlled data. For this project, we maintained wells (figure 1) to ensure a continuation of data flow from select sites to the National Ground-Water Monitoring Network. Snake Valley, Fish Springs, Castle Valley, and the Uinta Basin have wells that are not regularly pumped because they are dedicated monitoring wells. Without regular maintenance, these wells become clogged or filled with sediment, making the water in the wells not representative of the aquifer that they penetrate. The Fish Springs and Snake Valley wells are within the Basin and Range aquifer; the Castle Valley and Uinta Basin wells are within the Colorado Plateau aquifer.

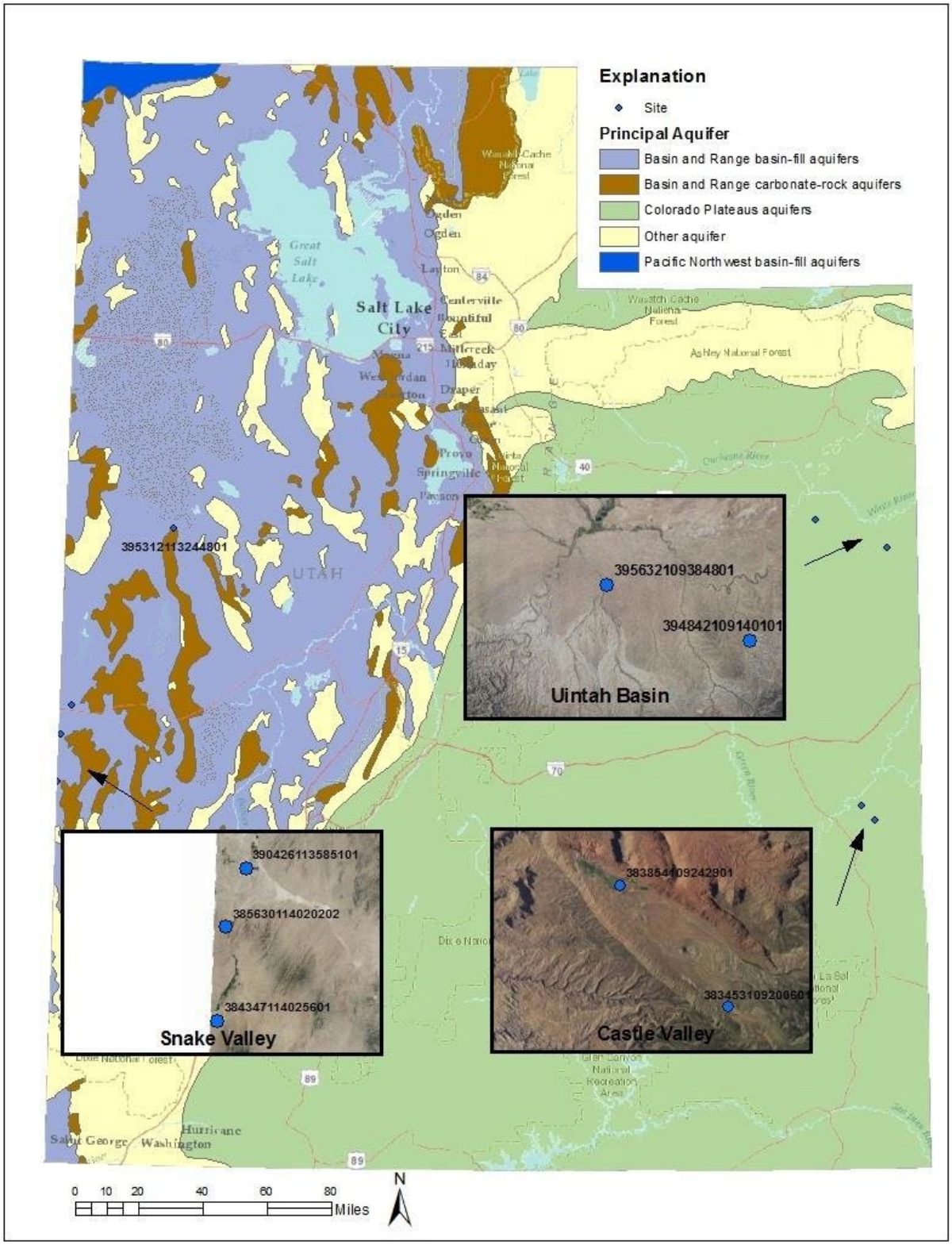
We performed well maintenance from our Snake Valley Water-Level monitoring network, Castle Valley monitoring network, and wells in the Uinta Basin. Four of the wells in the Snake Valley Water-Level Monitoring Network are included in the UGS Water-Quality Network (three in Snake Valley proper, and one at Fish Springs National Wildlife Refuge). Castle Valley has 6 existing monitor wells established by the UGS and are pumped and sampled when the Town (community of ~250 residents with a limited budget) is able to fund monitoring; only 2 wells are used to provide data to the Portal. The Uinta Basin has several wells that were drilled during the 1970s by the USGS but have not been pumped or used since UGS discovered them during a 2009 study; only two are currently used to provide data to the NGWMN Portal and are only pumped when funding is available, which was possible from this recent funding. None of the described wells are equipped with pumping apparatus and require the use of submersible pumps. This project was completed in one year and satisfies Objective 4 to maintain well connection to the aquifer (Basin & Range in western Utah and Colorado Plateau for southeastern and eastern Utah). UGS received federal government funding for $10,764.89, which was matched 50% with in-kind funding. Geologists and GIS Specialists in the Groundwater and Wetlands Program of the UGS performed all tasks in cooperation with the USGS and provided web services for database integration.

Well maintenance by the UGS consisted of the following tasks

Objective 4:

- Janae Wallace and Hugh Hurlow performed maintenance of wells in the NGWMN to ensure obtaining good quality water-quality and water-level data. The work included pumping and testing of the wells to ensure connection to the respective aquifers. These wells are only pumped once a year while obtaining water-quality samples; the maintenance of these wells allows us to continue to report information to the Portal to ensure the integrity of data.
- The maintenance for each site included the same activity, consisting of pumping each well with a portable submersible pump (Grundfos or Mega-Monsoon) to extract water from 8 sites until sediment-laden water cleared from the well bore. Hugh and Janae, independently, pumped each well for an extended duration. Pumping lasted several minutes to hours depending on the condition of the well. In general, pumping followed protocol outlined in the Framework document (appendix 5). Wells were purged of no less than three casing volumes. During purging, the sampler monitored the temperature, conductivity, and pH to assess the adequacy of the purging operation and recorded the results at least once for each casing volume of fluid purged. Purging was conducted using low-flow purging techniques.
- Janae Wallace is responsible for maintaining the Castle Valley (site numbers 383854109242901 and 383453109200601) and Uinta Basin sites (site numbers 395632109384801 and 394842109140101) and Hugh Hurlow maintains the Snake Valley sites (site numbers 390426113585101, 385630114020202, and 384347114025601) and the Fish Springs site (site number 395312113244801) (figure 1).
- For quality assurance Janae and Hugh ensured that field parameters stabilized and were similar to previous measurements before sampling.
- Janae Wallace is responsible for documenting well-maintenance activities in the final report (this report) for the project.

UGS Well maintenance falls under Objective 4, the task of periodic pumping to maintain connection to their respective aquifers (8 NGWMN sites that are not equipped with a pumping mechanism). The sites exist in targeted USGS principal aquifers: 4 in the basin fill of the Basin and Range aquifer and 4 wells in Colorado Plateau aquifer. The data obtained from this well maintenance has allowed us to share data and has been transferred to the Portal.


Explanation
Site
Principal Aquifer
Basin and Range basin-fill aquifers
Basin and Range carbonate-rock aquifers
Colorado Plateaus aquifers
Other aquifer
Pacific Northwest basin-fill aquifers
Salt Lake City
Ogden
Provo
UTAH
395312113244801
395632109384801
394842109140101
Uintah Basin
390426113585101
385630114020202
384347114025601
Snake Valley
383854109242901
383453109206001
Castle Valley
Ashley National Forest
Wasatch Cache National Forest
Dixie National Forest
Hurricane
Salt George
Washington
0 10 20 40 60 80
Miles
N