Gallup Ground Water Well:

Professional Services, Design & Construction

US Bureau of Reclamation WaterSMART Grant:
Drought Response Program: Drought Resiliency Projects –

FY2022
FOA Number:
R22AS00020

CFDA Number: 15.514
Funding Group II

Gallup Ground Water Well, Professional Services, Design & Construction

City of Gallup
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TEC NICAL PROPOSAL

EXECUTIVE SUMMARY

This proposal requests Bureau of Reclamation funding for professional well design engineering services, and construction over-site and implementation of a new City of Gallup potable water well for a three-year time period.

- The project will consist of professional fees for Geologist and Engineering, Well Design, Advertising for competitive construction bid, Construction Management and the cost for licensed/professional Well Contractor to build the new Gallup Ground Water Well SJ-1491). The project will take approximately 3 years to complete.

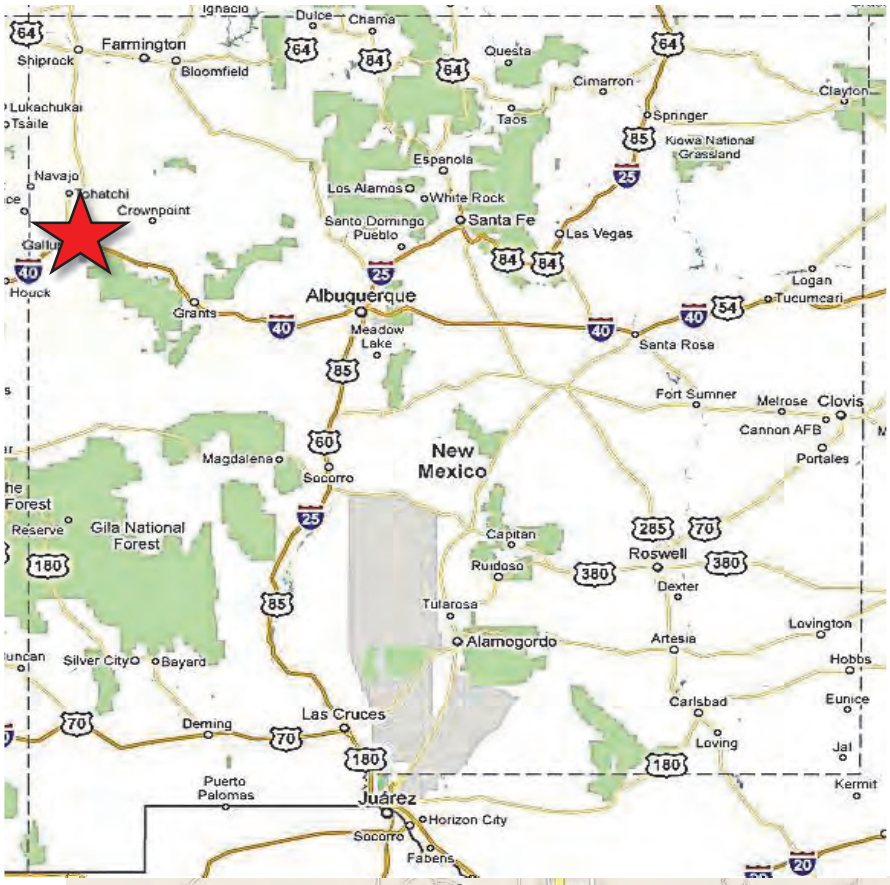
This project is supported by the *"Gallup/NGWSP Water Commons Drought Contingency Plan*"

The City of Gallup Water & Sanitation Department in McKinley County, New Mexico, will construct a new water production well for the Navajo Gallup Water Supply Project interim conjunctive water supply. The new well will add approximately 2170 acre-feet per ten years of local, high-quality water to the City's and the regions drinking water supply. The additional water will replace rapidly depleting water production from other wells in the G-96 well field. The project will include professional services design and construction of a new water production well and appurtenances.

The City of Gallup has experienced a variety of drought impacts, most recently in 2018 thru 2021: such as potential shortages of drinking water supplies, increased risk of wildfires, and environmental concerns. Construction of the new groundwater production wells will increase the reliability of Gallup's water supply and maintain its pumping and treatment capacity. The project is supported by the City of Gallup's – 2016 Growth Management Master Plan that states: Increase the long-range reliability of the city's water supply by:

1. Continue work to improve the aging water system including storage tanks, water lines, pump stations and treatment plant components.

2. Implement improvements in the water system to accommodate surface water from the Navajo Gallup Water Supply Project NGWSP and groundwater from the G-80 and G-22 well field development.

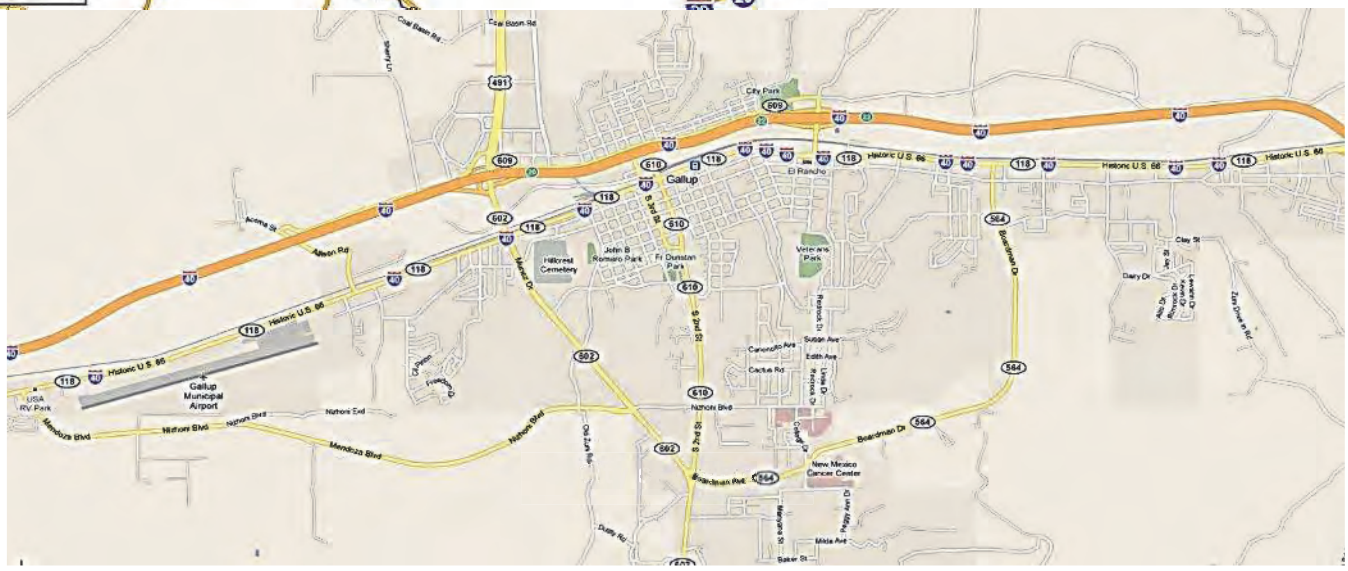


Map of the City of Gallup proposed wells - supplemental water supply

This City of Gallup is located 40 miles east of the Arizona border and 140 miles west of Albuquerque in the state of New Mexico. Latitude and Longitude 35.5281° N, 108.7426° W. It is the county seat of McKinley County. Approximately 120 Miles from Albuquerque and Farmington as the nearest, larger towns.

Geographic coordinates will be:

Well #1 - (SJ-1491)
Lat: 35°39'13.80"
Long: 108°45'58.98"



The Gallup area is heading for a water supply crisis, a trend that became clear to all legislators and guests present at recent New Mexico legislative hearings held in Gallup, which included reports from the City s contract engineers, from the Navajo Nation, and from the US Bureau of Reclamation. The scope and threat of the crisis have only been intensified by the regional demands resulting from the COVID pandemic and by the continuation of severe drought conditions in the West *only slightly cushioned in our case by the recent monsoon rains).*

For example, the City operates a public "water loading station" with potable water that is accessed intensively by area citizens who lack public water supply. In May and June of 2021 alone, utilization of this station exceeded 4.3 million gallons, a large increase resulting from COVID-impacted restricted use and weekend closings of Navajo Nation stations by the Navajo Tribal Utility Authority (NTUA .

The completion date for the NGWSP - which was once "set in stone" at 2024 - has now been projected to take an additional five years to 2029, as the result of strategic design changes and the need for additional Federal investment in the project. All of the City's planning and infrastructure investment efforts in water supply have been geared toward the original 2024 timeline, when we anticipated that our dependence on our depleting and stressed groundwater sources would be relieved by surface water supply being piped in from the San Juan River.

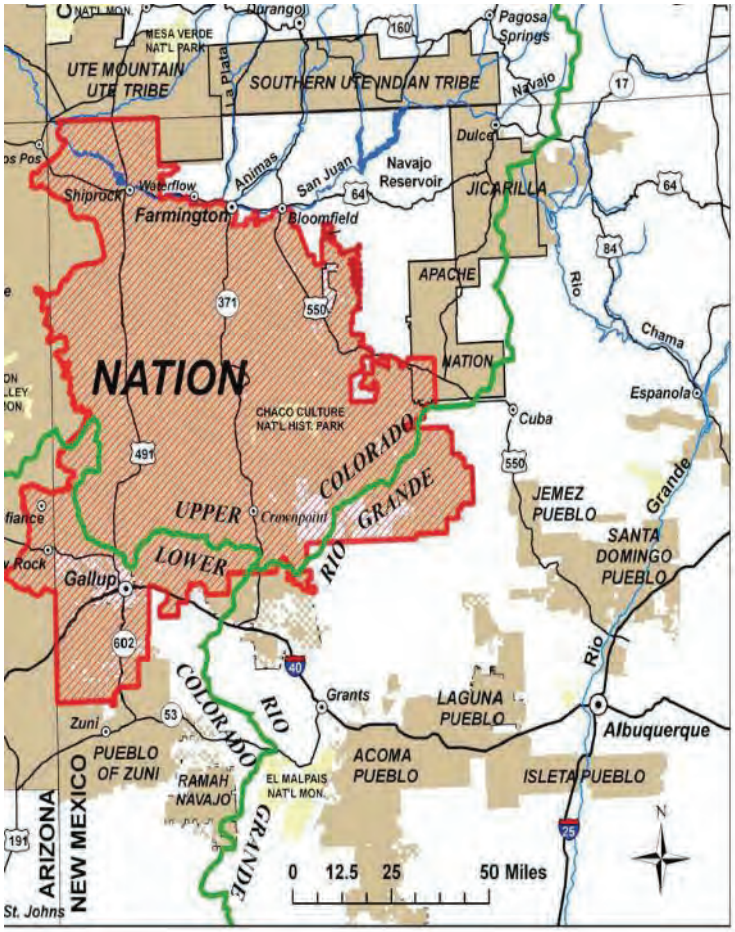
The City of Gallup and its surrounding rural communities were among the hardest hit last year by the COVID-19 pandemic, in which our region's extreme vulnerability to lack of public water supply was exposed for all the world to see. The City has received numerous requests from its neighbors to increase its groundwater diversions in order to supply water to rural unincorporated areas and Chapter communities of the Navajo Nation. The plan all along has been for Gallup to serve as a distribution "hub" for the "water commons" known as the Gallup-Rural Navajo Regional Water System, utilizing the anticipated surface water supply from the NGWSP upon the project's initial completion date of December 2024.

However, given the combination of the above COVID and drought impacts and the projected five year delay in NGWSP project completion, the City s existing groundwater wells will not be able to reliably supply water to both City customers and the surrounding communities. Under the new scenario, our engineers anticipate the need for the construction of four 4) new water supply wells before 2025 and at least two (2 more wells from 2025 to 2029 in order to meet water demands of Gallup and the surrounding area. Funding to meet this need is being researched and pursued, beginning with well construction in the "G-80/SJ-1491 Permit" well field

In total, we are seeking a $2 million investment from the State's COVID recovery funds and $2 Million from the Bureau of Reclamation to drill new wells to prevent a water supply crisis in Gallup and the surrounding area. Our engineering team can provide details as your staff may need to evaluate and prioritize this requested allocation.

On the Navajo Nation, existing groundwater supplies are dwindling, have limited capacity, and are of poor quality. More than 40 percent of Navajo households rely on water hauling to meet daily water needs. The city of Gallup’s groundwater levels have dropped approximately 200 feet over the past 10 years, and the supply is not expected to meet current water demands within the immediate term and over the coming 5 to 7 years.

The City of Gallup is a community of about 22,000 people at the center of numerous low-income communities throughout McKinley County, and the Zuni and Navajo Reservations.



NGWSP Stakeholder

Most of these communities have no businesses, schools, or hospitals. This makes Gallup the central economic and social hub for the area, and with a county population that is nearly 80 percent Native American, the city is often called the “Heart of Indian Country.”

The area that Gallup serves has a history of chronic poverty. Gallup has a soaring 37.8 percent poverty rate of the families in McKinley County that live below the federal poverty level which is close to three times the national average, and nearly a third higher than New Mexico’s statewide average, according to data from the U.S. Census Bureau, a child advocacy group and Data USA. The economic picture of the county and reservations shows even less prosperity. In 2017, the poverty threshold for a family with two adults and two children was $24,858.

The low tax base stemming from this historically torpid economy has left the area’s infrastructure needs unfulfilled. Therefore, many of these communities on the reservations and in the county don’t even have basic water utilities, much less, roads or electricity. According to the BOR’s 2007 Navajo-Gallup Water Supply Project Planning Report and Draft Environmental Impact Statement, more than 40 percent of Navajo households still rely on water hauling to meet daily water needs. This leaves many of them dependent on the City of Gallup for their water supply. The local government maintains a water station for these residents, and it’s a common sight around town to see rural residents hauling water in plastic tanks mounted on the back of their pickup trucks.

The city relies solely on a groundwater supply that continues to be progressively mined with little recharge into the source aquifers. Based on current projections, severe shortages in the groundwater supply are expected within the next decade, which would have severe social and economic impacts on the city and on neighboring Navajo communities.

This investment should be protected by supplementing our water supply in times of drought to support the White House Public/Private Partnership Initiative to modernize U.S. infrastructure to remove impediments to infrastructure development and facilitate private sector efforts to construct infrastructure projects serving American needs. Prioritizing water infrastructure needs and collaboration with stakeholders.

Therefore, The City of Gallup has a strong commitment to this *Gallup Ground Water Well - Professional Services, Design Construction* grant application that involves Navajo-Gallup Supply Project water stakeholders that depend on critical and vulnerable water supplies.

TEC NICAL PROJECT DESCRIPTION

City of Gallup Water Supply History:

The City's has a long term reliance on groundwater supply. Gallup has not had access to surface water and has had to rely solely on groundwater from extremely deep confined aquifers. Over the past 120 years, the City has constructed or acquired over 45 wells, only 15 wells are in service or operational today. Major drop in water levels, reduced pumping, sedimentation, water quality problems, cascading and increased pumping lifts and associated costs are the reasons that 30 wells are out of service, never to be used again. All other municipal and industrial users in the region also rely on the same limited groundwater source, making it a fast depleting resource. Gallup is unique among New Mexico' municipalities in the depth of its municipal wells and the extremely high cost for construction and operation, maintenance and replacement of those wells.

Gallup has an aggressive and successful conservation program that is widely cited by the New Mexico State Engineer as an example for other municipalities. This keeps the per capita water use to the lowest extent possible.

In 2010, the City of Gallup and McKinley County collaborated by executing a Joint Powers Agreement JPA which identifies a mechanism for small water systems in the County to access the NGWSP water. The JPA creates a Water Board for the region. The Water Board would help small communities negotiate water rates, ensure operation, and help ensure water supply during droughts or other times when water is not available due to mechanical failures. Once the Gallup Regional Water System infrastructure is constructed and operational, the initial water supply would be ground water from the City's existing and proposed wells then switched to surface water when the NGWSP pipeline is in place and operating. The delivery date of surface water was set to be December 31, 2024, however with the extension of time that was recently approved the delivery date is unknown. Some estimate at least a 5 year delay. The entire area is dependent on groundwater until the surface water is available. This means that the unincorporated communities currently served and future communities like Williams Acres and Catalpa Hills will connect to the Gallup Regional Water System and will receive groundwater supplied by COG wells, as opposed to imported surface water until the surface water is available.

Operation: there are physical limitations of the existing aquifer. To ensure an adequate water supply to the Gallup Regional Water System through 2030, three 3) new wells are proposed under the G-80/SJ-1491 permit and three 3 wells are proposed under the G-22 permit. These proposed wells along with water from the Twin Lakes Well should hold up the City's water supply until the surface water is available.

The City is struggling financially to ensure that its wells are operating because most of the submersible well pump assemblies only last about 3 to 4 years and it costs about $200,000.00 each to return the well to service. This is the case with Junker No. 1 which is one of the City's highest producing wells. Junker No. 1 was out of service since July 2019, and just recently, the City was able to get it back up and running. The repairs were delayed almost 18 months

until funds were available even when high summer demands were underway. As stated above, the City anticipated surface water delivery by the end of 2024. Now, given the undefined extension of time to construct and begin operation of the NGWSP, the City does not know when the surface water will arrive. Over the past 120 years the City has drilled about 45 wells, and only 15 wells are active. Relying on the U.S. and New Mexico's assurances, the City has spent millions of dollars on the Navajo-Gallup Water Supply Project and has not drilled a production well in over 20 years. There is uncertainty in the groundwater production facilities because of lack of active production wells and because the City is paying for the NGWSP which leaves no funds for new well construction and limited funds for well maintenance. Without the Bureau of Reclamation's assistance, the City of Gallup cannot afford to pay for the surface water pipeline and drill 3460' deep wells that cost approximately $4 million each.

PERFORMANCE MEASURES

This *Gallup Ground Water Well - Professional Services, Design & Construction* program will promote good water management and efficient water use.

The City of Gallup's strategy to monitor the ***Gallup Ground Water Well - Professional Services, Design & Construction*** program's performance will be accomplished by gathering SCADA data of water produced in an Excel spreadsheet report from the City's Water Sanitation Department. Meetings will be held with the well professional engineering firm and contractor as needed to address any concerns.

PROJECT BUDGET

City of Gallup Water Production Wells
BUDGET ESTIMATE

BUDGET ITEM DESCRIPTION	COMPUTATION			Reclamation	Recipient	TOTAL COST
	Price/Rate	Unit	Quantity			
Grant Administrator - Environmental Program Coordinator	$30.00	HR	300.00	$ -	$ 15,000	$ 15,000
			Subtotal	$ -	$ 15,000	**$ 15,000**
FRINGE BENEFITS - See proposal in official file for detailed calculations						
Grant Administrator - Environmental Program Coord	$30.00	33.33%		$ -	$ 5,000	$ 5,000
EQUIPMENT - Leased Equipment use rate + hourly wage/salary x est. hours for assisted activity—Describe equipment to be purchased, unit price, # of units for all equipment to be purchased or leased for assisted activity: Do not list contractor supplied equipment here.						
N/A				$ -	$ -	$ -
SUPPLIES/MATERIALS - Describe all major types of supplies/materials, unit price, # of units, etc., to be used on this assisted activity.						
N/A				$ -	$ -	$ -
CONTRACTUAL/ CONSTRUCTION - Explain any contracts or sub-Agreements that will be awarded, why needed. Explain contractor qualifications and how the contractor will be selected.						
DePauli Engineering and Surveying, LLC - Project Engineering and Land Surveyor; John Shomaker Geologist			1	$ 681,200	$ -	$ 681,200
Water Well Construction, Well House Construction and Well Pump Installation				$ 1,306,248	$ 1,980,000	$ 3,286,248
			Subtotal	$ 1,987,448	$ 1,980,000	**$ 3,967,448**
PERMITS -						
Temporary access permits and off site utilities extensions				$ -	$ -	$ -
			Subtotal	$ -	$ -	**$ -**
OTHER -						
BOR Environmental Costs				$ 12,552		$ 12,552
			Subtotal	$ 12,552		**$ 12,552**
TOTAL DIRECT COSTS:				$ 2,000,000	$ 2,000,000	$ 4,000,000
INDIRECT COSTS -						
	0.00%	percent				$ -
TOTAL ESTIMATED PROJECT/ACTIVITY COSTS:				$ 2,000,000	$ 2,000,000	**$ 4,000,000**

Budget Proposal

The City of Gallup -City Council Recipient Funding has approved 50% interim matching funds; and, staff is researching State of New Mexico funding opportunities to use as a portion of the matching funds required under this program, so that fiscal impacts to the City are minimized.

Total Cost Summary

Total Project Cost Summary

FUNDING SOURCES	Amount
SOURCE	
Costs to be reimbursed with the requested Federal funding	$2,000,000
Costs to be paid by the Applicant	$20,000
Value of third-party contributions - State of New Mexico funds for Water Well Construction, Well House Construction and Well Pump Installation *for 3 years*	$1,980,000
Total Project Funding:	**$4,000,000**

Non-Federal & Federal Funding Sources Summary

Non-Federal & Federal Funding Sources Summary

FUNDING SOURCES	Amount
Non-Federal Entity (City of Gallup)	
1. Project Grant Administrator, Plans, Coordinates *"Gallup Ground Water Well, Professional Services, Design & Construction" grant* for 3 years	$20,000
2. Budgeted City / Recipient and State of New Mexico funds for Water Well Construction, Well House Construction and Well Pump Installation *for 3 years*	$1,980,000
3. Budget for Temporary Access Permits & Off-Site Utilities extension fees *for 3 yrs. Inplace*	$0
Non-Federal Entities SUBTOTAL:	**$2,000,000**
Requested Reclamation Funding:	**$2,000,000**
Total Project Funding:	**$4,000,000**

Budget Narrative

$ 4 million is budgeted for the *Gallup Ground Water Well - Professional Services, Design Construction* work. This project is listed as an Implementation Policy in the City of Gallup 2013 Water Conservation Plan. Our Professional Services local civil engineering firm: DePauli Engineering & Surveying, LLL will provide well engineering design documents, and coordinate the RFP - well construction and oversight bid documents per our City of Gallup procurement requirements. It should be noted, that only a New Mexico licensed and bonded well driller can construct the wells. Selection of the driller will be made by competitive construction advertising and bidding. The BOR Environmental Cost will be $12,552.

The City of Gallup has budgeted $2,000,000 for FY2022 for this grant as Recipient Cost Share funds. To include Grant Administrator staff time, and fringe benefits will be paid for by the City for this project as In-Kind costs budgeted at $20,000 for three years.

The City of Gallup Signatory - the City Manager - Maryann Ustick has sole authority to sign this contract; and, No Board approval is necessary.

ENVIRONMENTAL & CULTURAL RESOURCES COMPL ANCE

Will the proposed project impact the surrounding environment e.g., soil [dust], air, water [quality and quantity], animal habitat ? **No**

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? **No**

When was the water delivery system constructed?
Approximately in the 1900's to current time period

Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands? **No**

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**

City of Gallup Drought Resiliency Well Compliance Budget

The City of Gallup intends to develop a new well for Municipal & Industrial (M&I) water and is applying for drought resiliency grant through Reclamation to help fund it. The well will be connected into the Navajo Gallup Water Supply Project (NGWSP) distribution system. The City of Gallup with be acquiring the services of an archaeological contractor for a survey of the well development area and any connecting pipelines. The City of Gallup will also handle any CWA permitting requirements. The City of Gallup has requested Reclamation to complete any required environmental surveys, ESA consultation, Section 106 consultation, and NEPA compliance. Below is an estimated budget for Reclamation to complete the work:

Position	Hours	Rate	Total
Project Manager	16	$101.00	$1,616.00
Biologist	108	$84.00	$9,072.00
Archaeologist	16	$79.00	$1,264.00
Direct/Indirect Costs (Mailings, Printing, Admin Time, etc.)			$600.00
		Total Cost	$12,552.00

Assumptions:

- A biological survey of the well and associated pipeline can be accomplished by a biologist in a single day (12 hours) of fieldwork. Cost estimate assumes that no T&E species are located in the project area and the project will have a no effect determination. Presence of T&E species or the requirement of a BO from the FWS will increase the required cost.
- The Class III archaeological survey will be negative or the proposed undertaking will not adversely affect historic properties in the APE. The Section 106 consultation with the NM SHPO and any associated tribes will not require mitigating adverse effects or the development of a MOA. If there are historic properties located that can not be avoided mitigation will increase the required cost. If construction requires archaeological monitoring it is assumed City of Gallup will provide the permitted monitor.
- An Environmental Assessment will need to be prepared for this project. Reclamation will prepare this document following the completion of the biological and cultural surveys of the project area.

E.1.1. EVALUATION CRITERION

E.1.1. Evaluation Criterion A—Project Benefits
(30 points)

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

This Gallup Ground Water well grant project will build long-term resilience to drought by making additional water supplies available for 40 years, in conjunction with the surface water supply.

Will the project make additional water supplies available? **Yes**
If so, what is the estimated quantity of additional supply the project will provide:

2,170 acre-feet over a 10 year period

How was this estimate calculated? Based on the well characteristics of similar wells

Provide this quantity in acre-feet per year as the average annual benefit over ten years.

Pump schedule of proposed wells: Years 1-5 1,085 acre-feet; Years 5 -10 1,085 acre-feet; Years 11-20 = 2,170 acre-feet; Years 21 – 40 = 2,600 acre-feet

What percentage of the total water supply does the additional water supply represent? 6.7%
How was this estimate calculated?

Proportional to average annual production over the past 10 years.

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

Additional groundwater will help offset the delay in surface water delivery from the Navajo-Gallup Water Supply Project.

Will the project improve the management of water supplies? *For example, will the project increase efficiency, increase operational flexibility, or facilitate water marketing (e.g., improve the ability to deliver water during drought or access other sources of supply)?*

Yes, new wells will reduce the hydrological stress on the existing well field

What is the estimated quantity of water that will be better managed as a result of this project?
2,170 acre-feet over a 10 year period

How was this estimate calculated?
Based on the well characteristics of similar wells

Provide this quantity in acre-feet per year as the average annual benefit over ten years (e.g., if the project captures flood flows in wet years, provide the average benefit over ten years including dry years).

Pump schedule of proposed wells: Years 1-5 1,085 acre-feet; Years 5 -10 1,085 acre-feet; Years 11-20 = 2,170 acre-feet; Years 21 – 40 = 2,600 acre-feet

- ***How will the project increase efficiency or operational flexibility?***

  The proposed wells will increase the efficiency of the City water supply by pump water from an aquifer that is separate from City's main water supply aquifer. These new well source will provide that City operational flexibility by allowing development of a new water source. This relieves the reliance on the City's existing water supply aquifer which has been the City's main source of water for the last 120 years. **2,170** acre-feet of additional water is anticipated average annual benefit over a 10 year period.

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

  100% - The City of Gallup anticipates that all water production will be better managed or else the City and surrounding area will run out of water.

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

  The Federal Government, local Governor, Legislature, and the public are aware of the heavy impact of COVID-19 on the Gallup region, which included in May 2020 a total shutdown of interstate and other traffic from access into and out of the City of Gallup. However, the immediate, and now longer-term, impacts of COVID-19 on our economy and on our public resources have been significant. Other than the human stresses related to disease, hospitalization and death, as well as to the effects of social isolation and loss of educational opportunity, our most severely stressed resource has been water.

  The COVID-19 pandemic triggered a pronounced upward trend in the demands on the City's public water supply, breaking our historical water consumption "ceiling" of 3,200 acre-feet/year. One of Gallup's unique features as a major trading hub bordering the Navajo Nation is that we have public water loading stations that local and neighboring citizens can access to meet their household water needs. Over one-third of homes in the rural Navajo Chapter communities of the "Gallup Water Commons" do not have running water, and the primary method of meeting water needs is collection and hauling of water in various sized containers from identified public water sources. The Navajo Nation and its Utility Authority maintain numerous such water stations, under COVID-19 public health orders, most of these stations were closed for extended periods of time to everyday water-haulers. The next best option for many hundreds of households is using public water stations in the City of Gallup.

  Between 2019 and 2021, the Gallup Regional Water System experienced a 6.7% increase in COVID related water demand. The increases were disproportionately caused by increases of out-of-town uses. The City's engineering team projects that this upward trend will continue in

the coming months and years, as existing supply sources struggle to keep up with regional water demands. This difference, amounting to about 41 million gallons per year (3.4 million gallons per month), is equivalent to the production of one new well.

This scenario only touches the surface of a deeper set of problems: the City's groundwater supply has been depleting year-by-year with no re-charge, and the City s existing wells are not adequate to meet projected demand in the immediate term and over the coming 5 to 7 years. We have known this for a long time, but through our **partnership with the Navajo Nation, the State of New Mexico and the US Government,** in the 1990s and 2000s a long-term water supply solution was planned by a consortium of local, tribal, state and federal agencies, and in 2009 it was subsequently federally authorized and funded for over $1 billion: the Navajo-Gallup Water Supply Project (NGWSP}. The "firm" deadline in that legislation was December 31, 2024, at which time surface water from the San Juan River would become available to the Gallup regional water system, by which both the City and its many rural neighbors would be assured a sustainable water supply. Existing groundwater wells would become de-stressed and take on the secondary function of backup systems when needed due to surface water shortages in the Colorado River Basin and other potential supply interruptions.

Unfortunately, the Navajo Nation, the State of New Mexico and the US Bureau of Reclamation have agreed, without concurrence by the City of Gallup as a co-investor and co-beneficiary of the project, to modify the design of a critical element of the NGWSP and, as a result, to push out the completion date to around 2029. This re-design and at least 5-year delay in the completion date of the project have two adverse impacts on the City of Gallup: the project will incur additional costs, for which supplemental federal funding will be needed - probably with local match requirements that the City of Gallup cannot afford; and the City will be required to invest in a series of new groundwater wells, costing upwards of $16 million, in order to be able to deliver water to City and neighboring customers in the project service area for an additional 5 years in the absence of the anticipated surface water supply from NGWSP.

All of the above is further complicated by the deepening of the extreme drought conditions plaguing the State, with the Gallup area among the hardest hit regions. Such conditions will only cause additional pressure on Gallup water supplies by users throughout the region.

We are requesting $2.0 million in federal funding in order to install the essential water infrastructure needed to meet current and projected demand by the residents and businesses of the City of Gallup and of the neighboring rural communities that depend on Gallup's water supply system.

See this three (3) page letter to the NM Cabinet Secretary – Department of Finance and Administration …

CITY OF GALLUP

Louie Bonaguidi, Mayor
Linda Garcia, District 1 Councilor
Michael Schaaf, District 2 Councilor
Yogash Kumar, District 3 Councilor
Fran Palochak, District 4 Councilor
Maryann Ustick, City Manager
Curtis G. Hayes, City Attorney

September 24, 2021

Ms. Debbie Romero
Cabinet Secretary
Department of Finance & Administration
State of New Mexico
180 Bataan Memorial Building
Santa Fe, NM 87501
Debbie.Romero@state.nm.us

RE: Water Funding for Gallup per 2021 House Bill 2/3

Madam Secretary:

We write this urgent letter in reference to the appropriation included in House Bill 2/3, 2021 Legislative Session, page 185, #31 (dollars re-stated in $0s):

> (31) DEPARTMENT OF FINANCE AND ADMINISTRATION: $2,000,000.00
> For financial assistance to local governments in New Mexico that experience extraordinary costs associated with the coronavirus disease 2019 public health emergency.

The original legislation was introduced in response to the unique circumstances being experienced in the Gallup area under a "perfect storm" of COVID-19, extreme drought, and unexpected changes in the federal timeline for the region's premier water project. We are now deep into that "storm" and would like to access the above-referenced $2.0 million in funding in order to install the essential water infrastructure needed to meet current and projected demand by the residents and businesses of the City of Gallup and of the neighboring rural communities that depend on Gallup's water supply system.

The Governor, the Legislature and the public are aware of the heavy impact of COVID-19 on the Gallup region, which included in May 2020 a total shutdown of interstate and other traffic from access into and out of the City of Gallup. The City's response, in collaboration with its neighbors in McKinley County, the Pueblo of Zuni and the Navajo Nation, has been strongly in-step with the Governor's public health orders, and we now have one of the highest vaccination rates in the nation. However, the immediate, and now longer-term, impacts of COVID-19 on our economy and on our public resources have been significant. Other than the human stresses related to disease, hospitalization and death, as well as to the effects of social isolation and loss of educational opportunity, our most severely stressed resource has been water.

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The COVID-19 pandemic triggered a pronounced upward trend in the demands on the City's public water supply, breaking our historical water consumption "ceiling" of 3,200 acre-feet/year. One of Gallup's unique features as a major trading hub bordering the Navajo Nation is that we have public water loading stations that local and neighboring citizens can access to meet their household water needs. Over one-third of homes in the rural Navajo Chapter communities of the "Gallup Water Commons" do not have running water, and the primary method of meeting water needs is collection and hauling of water in various sized containers from identified public water sources. The Navajo Nation and its Utility Authority maintain numerous such water stations, usually located at local Chapter Houses, but under COVID-19 public health orders, most of these stations were closed for extended periods of time to everyday water-haulers. The next best option for many hundreds of households is the public water stations in the City of Gallup.

Between 2019 and 2021, the Gallup Regional Water System experienced a 6.7% increase in COVID-related water demand. The increases were disproportionately caused by increases of out-of-town uses. The City's engineering team projects that this upward trend will continue in the coming months and years, as existing supply sources struggle to keep up with regional water demands. This difference, amounting to about 41 million gallons per year (3.4 million gallons per month), is equivalent to the production of one new well.

This scenario only touches the surface of a deeper set of problems: the City's groundwater supply has been depleting year-by-year with no re-charge, and the City's existing wells are not adequate to meet projected demand in the immediate term and over the coming 5 to 7 years. We have known this for a long time, but through our partnership with the Navajo Nation, the State of New Mexico and the US Government, in the 1990s and 2000s a long-term water supply solution was planned by a consortium of local, tribal, state and federal agencies, and in 2009 it was subsequently federally authorized and funded for over $1 billion: the *Navajo-Gallup Water Supply Project (NGWSP).* The "firm" deadline in that legislation was December 31, 2024, at which time surface water from the San Juan River would become available to the Gallup regional water system, by which both the City and its many rural neighbors would be assured a sustainable water supply. Existing groundwater wells would become de-stressed and take on the secondary function of backup systems when needed due to surface water shortages in the Colorado River Basin and other potential supply interruptions.

Unfortunately, the Navajo Nation, the State of New Mexico and the US Bureau of Reclamation have agreed, without concurrence by the City of Gallup as a co-investor and co-beneficiary of the project, to modify the design of a critical element of the NGWSP and, as a result, to push out the completion date to around 2029. This re-design and at least 5-year delay in the completion date of the project have two adverse impacts on the City of Gallup: the project will incur additional costs, for which supplemental federal funding will be needed – probably with local match requirements that the City of Gallup cannot afford; and the City will be required to invest in a series of new groundwater wells, costing upwards of $16 million, in order to be able to deliver water to City and neighboring customers in the project service area for an additional 5 years in the absence of the anticipated surface water supply from NGWSP.

All of the above is further complicated by the deepening of the extreme drought conditions plaguing the State, with the Gallup area among the hardest hit regions. Such conditions will only cause additional pressure on Gallup water supplies by users throughout the region.

In light of all of these factors, rendered all the more urgent by the multiple impacts of the COVID-19 pandemic, we would like to utilize the $2.0 million House Bill 2 appropriation, in combination with other funding being sought in parallel, to support and accelerate construction of a new groundwater well as part of our plan to meet the water needs of our region's citizens.

We would appreciate your advice and assistance in how we may proceed to access this appropriation and commence the much-needed work at hand. For your initial reference, we are attaching the cost estimates for "Well #1/SJ 1491," as evidence of our readiness to implement the project. We stand ready to provide any and all additional detail that you might need, and to provide our request in whatever form you may require.

Thanks always for your leadership in moving resources to where the need is greatest in our State.

Sincerely,

Maryann Ustick
City Manager

Attachment

cc: Louie Bonaguidi, Mayor, City of Gallup
Gallup City Council Members
Curtis Hayes, City Attorney, City of Gallup
Marc DePauli, DePauli Engineering & Surveying LLC
Mark Fleisher, Lobbyist, City of Gallup

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

  Supervisory Control and Data Acquisition (SCADA) will provide essential monitoring and database systems for water managers. SCADA advantages including increased reliability, reduced costs, improved worker safety, greater customer satisfaction and improved utilization. SCADA have alarms and real-time views into operations that can prevent small problems from becoming big ones, and can also speed restoration time.

  Gathering data through a SCADA system allows the City of Gallup to track ongoing trends and analyze information in order to take action after fault indications are found.
  SCADA systems allow for rapid response, which helps the City of Gallup maintain uptime mission-critical processes. SCADA systems are always collecting data from your remote equipment and processes. All of this information is usually stored in a central master station.

Wells —

- ***What is the estimated capacity of the new well(s)***

  The estimated capacity of each new well is 2,170 acre-feet over a 10 year period. The estimated capacity of new wells are contained in the Report by Doctor John W. Shomaker Drawdown – "Addendum to Effects of Proposed Pumping from Westwater Canyon Aquifer in Yah-Ta-Hey Well Field, City of Gallup, New Mexico , Dated July 29, 2020.

- ***How much water do you plan to extract through the well s)?*** = 2,170 acre-feet per 10 years

  Approval of G-80/SJ1491 groundwater diversion permit will allow the City to pump up to 2,600 ac-ft per year of groundwater for municipal, commercial and industrial use. The permit contains multiple well sites.

- ***Will the well be used as a primary supply or supplemental supply when there is a lack of surface supplies?***

  The proposed wells will initially be used as a primary water supply until the NGWSP water is available. Once the surface water is available the well water will be used when the surface water is not available during drought, operational shut down, or water quality issues.

- ***Please provide information documenting that proposed well(s) will not adversely impact the aquifer it/they are pumping from (overdraft or land subsidence).***
  At a minimum - this should include aquifer description, information on existing or planned aquifer recharge facilities, a map of the well location and other nearby surface water supplies, and physical descriptions of the proposed well(s) (depth, diameter, casing description, etc.)

  This is documented in a report by John Shoemaker regarding nearby wells, specific aquifer and well characteristics. No aquifer overdraft or land subsidence will occur, or, is anticipated. See Attachment.

- ***If available, information should be provided on nearby wells (sizes, capacities, yields, etc.), aquifer test results, and if the area is currently experiencing aquifer overdraft or land subsidence.***

  This is documented in a report by John Shoemaker regarding nearby wells, specific aquifer and well characteristics. No aquifer overdraft or land subsidence will occur, or, is anticipated. See Attachment.

- ***Please describe the groundwater monitoring plan that will be undertaken and the associated monitoring triggers for mitigation actions.***

  Performance measure shall be to provide an uninterrupted supply of water for the Gallup Regional water system, during drought, or mine spills or operational failures or delays or other events that disrupt the NGWSP surface water supply. Water supply from the Gallup Ground Water Well shall provide the water needed to accomplish this. Well production and water level will be reported the State of New Mexico Office of the State Engineer.

- ***Describe how the mitigation actions will respond to or help avoid any significant adverse impacts to third parties that occur due to groundwater pumping.***

  No mitigation actions are need because no adverse impacts to third parties are anticipated due to groundwater pumping.

E.1.2. Evaluation Criterion B—Sustainability and Supplemental Benefits
(20 points)

1. **Climate Change.** ***Prioritize and take robust actions to reduce climate pollution, increase resilience to the impacts of climate change, protect public health, and conserve our lands, waters, oceans, and biodiversity. Examples in which proposed projects may contribute to climate change adaptation and resiliency, may include but are not limited to the following:***

   - ***In addition to drought resiliency measures, does the proposed project include other natural hazard risk reductions for hazards such as wildfires or floods?*** **No**

   - ***Does the proposed project include green or sustainable infrastructure to improve community climate resilience such as, but not limited to, reducing the urban heat island effect, lowering building energy demands, or reducing the energy needed to manage water?*** **No**

   - ***Will the proposed project establish and use a renewable energy source?*** **No**

   - ***Does the proposed project seek to reduce or mitigate climate pollutions such as air or water pollution?*** **No**

   - ***Will the proposed project reduce greenhouse gas emissions by sequestering carbon in soils, grasses, trees, and other vegetation?*** **No**

- ***Does the proposed project have a conservation or management component that will promote healthy lands and soils or serve to protect water supplies and its associated uses?***
  Yes, this project will be used conjunctively with the surface water supply

- ***Does the proposed project contribute to climate change resiliency in other ways not described above?***
-
  Yes, It is provide a back-up Water Supply for our Native American stakeholders since NGWSP has been delayed for over 5 years; especially in times of drought. *Gallup Ground Water Well – Professional Services, Design & Construction* - new water well will provide a resilient water supply to native, indigenous, disadvantaged, underserved communities in Gallup and McKinley County.

  It helps climate change resiliency in Gallup and surrounding Native American communities by providing essential water supplies to the citizens, businesses and Native American population that is not available in drought prolonged periods.

2. **Disadvantaged or Underserved Communities:** EO 14008 & EO 13985 affirm the advancement of environmental justice and equity for all through the development and funding of programs to invest in disadvantaged or underserved communities.

- ***Will the proposed project serve or benefit a disadvantaged or historically underserved community?***
  Yes, by insuring clean water supplies for public health; especially, with increased clean water needed during the Covid 19 pandemic and ongoing water safety needs that this new water well can provide to improve water quality, and providing new water supplies. This new water source may have the possibility of future economic growth opportunities after the needs of the citizens have been met.

- ***If the proposed project is providing benefits to a disadvantaged community, provide sufficient information to demonstrate that the community meets the applicable state criteria or meets the definition in Section 1015 of the Cooperative Watershed Act (defined as a community with an annual median household income that is less than 100 percent of the statewide annual median household income for the state .***

  New Mexico has long suffered from poverty as well, especially within the Native American population. More than 37 percent of New Mexico's population lives below the poverty line, placing New Mexico ninth in the nation for having a population in poverty. Over the past year, Gallup's high poverty rate and chronic shortage of safe, affordable rentals have helped fuel one of the worst COVID-19 outbreaks in the country.

  Gallup has a soaring 37.8 percent poverty rate, close to three times the national average and nearly a third higher than New Mexico's statewide average, according to data from the U.S. Census Bureau, a child advocacy group and Data USA .

- ***If the proposed project is providing benefits to an underserved community, provide sufficient information to demonstrate that the community meets the underserved definition in E.O. 13985, which includes populations sharing a particular characteristic, as well as geographic***

communities, that have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life.

The poverty line is considered the minimum amount of resources necessary to meet the basic needs of a family unit. The poverty threshold is the same throughout the country; it does not consider geographic differences in the cost of living. In 2017, the poverty threshold for a family with two adults and two children was $24,858.

The Poverty level in McKinley County and Gallup is 37.8 % . McKinley County also has the highest rate of school-age children living in poverty (45.9 percent .
Poverty data by state are from the American Community Survey ACS) 1-year estimates, while county data are from the Small Area Income and Poverty Estimates Program (SAIPE). Both estimates are produced by the U.S. Census Bureau. https://www.dws.state.nm.us/Portals/0/DM/LMI/Poverty_in_NM.pdf, page 11.

Issues underlying concentrated poverty and its effects in Gallup and surrounding Native American communities range from broad and systemic – including regulatory and procedural barriers in accessing basic services such as the right to have wet, running water in households, coordination among government agencies and service providers, and limited locally available entry-level job opportunities to specific individuals, among them dependence on government assistance, impaired health, low educational attainment, and limited financial stability. Four dominant issues are: 1) the role of geographic isolation in limiting access to services and employment opportunities; 2) the effects of land status on economic development; 3) poor housing conditions with no running water; 4) the limited availability of financial services.

3. **Tribal Benefits:** The Department of the Interior is committed to strengthening tribal sovereignty and the fulfillment of Federal tribal trust responsibilities. The President s memorandum, "Tribal Consultation and Strengthening Nation-to-Nation Relationships," asserts the importance of honoring the Federal government's commitments to Tribal Nations.

Does the proposed project support tribal resilience to climate change and drought impacts or provide other tribal benefits such as improved public health and safety through water quality improvements, new water supplies, or economic growth opportunities?

Yes, since The United States Congress passed the Omnibus Public Land Management Act of 2009, Title X Part III Public Law 111-11 , authorizing the Bureau of Reclamation Reclamation to construct, operate, and maintain the Navajo-Gallup Water Supply Project (NGWSP . The NGWSP will provide a reliable water source to indigenous communities and municipalities within the arid Southwest, bringing running water to many households for the first time.

The project involves installation of approximately 300 miles of pipeline to transport water from the San Juan River to the Navajo Nation, Jicarilla Apache Nation, and the City of Gallup in Sandoval and McKinley counties, New Mexico and in portions of the Navajo Nation in Apache County, Arizona. In addition to the pipeline, construction of two water treatment plants and 120 miles of power line and other infrastructure will also be completed.

Since NGWSP has been delayed 5 or more years this new well will provide essential water to Native American tribes that would have to wait another 5 years or more without this new wet water. These new ground water wells will help mitigate climate change, drought impacts, and provide tribal benefits such as improved public health and safety measures; especially, since COVID is still here, new well water will improve water quality, and support indigenous water supplies opportunities.

NGWSP's goal is to provide a reliable water source to indigenous communities and to municipalities within the arid Southwest. Large parts of the indigenous communities have never had running water in their households; this project will change that.

Does the proposed project support Reclamation's tribal trust responsibilities or a Reclamation activity with a Tribe?

- The Supreme Court first recognized the existence of a federal-Indian trust relationship in its early cases interpreting Indian treaties. Between 1787 and 1871, the U.S. entered into nearly four hundred treaties with Indian tribes. Generally, in these treaties, the U.S. obtained the land it wanted from the tribes, and in return, the U.S. set aside other reservation lands for those tribes and guaranteed that the federal government would respect the sovereignty of the tribes, would protect the tribes, and would provide for the well-being of the tribes.
- The Supreme Court has held that treaties created a special relationship between tribes and the federal government that obligates the government to keep its end of the bargain given that tribes have kept theirs. This principle, that the government has a duty to keep its word and fulfill its treaty commitments is known as the doctrine of trust responsibility. See, e.g., Seminole Nation v. U.S. (1942), and U.S. v. Mason 1973), and Morton v Mancari 1974).
- The trust doctrine is a source of federal responsibility to Indians requiring the federal government to support tribal self-government and economic prosperity, duties that stem from the government's treaty guarantees to protect Indian tribes and respect their sovereignty. In 1977, the Senate report of the American Indian Policy Review Commission expressed the trust obligation as follows:

  The purpose behind the trust doctrine is and always has been to ensure the survival and welfare of Indian tribes and people. This includes an obligation to provide those services required to protect and enhance tribal lands, resources, and self-government, and also includes those economic and social programs which are necessary to raise the standard of living and social well-being of the Indian people to a level comparable to the non-Indian society.

- A second aspect of the trust responsibility arises from the fact that Congress, primarily through legislation, has placed most tribal land and other property under the control of federal agencies to the extent that virtually everything a tribe may wish to do with its land must be approved by the federal government.

- "*The Navajo-Gallup Water Supply Project will be trans-formative for communities in the Navajo Nation, the Jicarilla Apache Nation, and Gallup*." said Senator Martin Heinrich (D-NM – *"Over the last decade, I've been proud to fight for the major federal investments*

necessary to finally deliver long-term clean drinking water supplies to thousands of families throughout northwestern New Mexico. The construction of this major project is also creating jobs and promoting economic development throughout the region. I will continue working to uphold the federal commitments in the historic Navajo Nation Water Rights Settlement Agreement and ensure that our communities in Indian Country have the resources they need to thrive."

4. **Ecological Value:** Drought resiliency projects often provide environmental benefits in addition to water supply reliability benefits for other users. Ecological resiliency is crucial to sustain ecosystems that can respond to and recover from external stressors resulting from climate change and drought.

   - ***Does the project seek to improve ecological climate change resiliency of a wetland, river, or stream to benefit to wildlife, fisheries, or habitats? Do these benefits support an endangered or threatened species?***
     No

   - ***What are the types and quantities of environmental benefits provided, such as the types of species and the numbers benefited, acreage of habitat improved, restored, or protected, or the amount of additional stream flow added? How were these benefits calculated?***
     N/A

   - ***Will the proposed project reduce the likelihood of a species listing or otherwise improve the species status?***
     No

E.1.3. Evaluation Criterion C—Drought Planning & Preparedness (15 points)

The "*Gallup/NGWSP Water Commons Drought Contingency Plan" is a critical Priority.*

- ***Describe how the proposed project is prioritized in the referenced drought plan?***

  The "*Gallup/NGWSP Water Commons Drought Contingency Plan" - states:*
  The Number 1, absolutely critical Priority for the City of Gallup's *NGWSP Water Commons Drought Contingency Plan* is to Develop Additional Well Field/s, which is only second to completing the NGWSP which currently is on hold for at least 5 years. Drilling and developing Additional Well Fields an essential, top priority.

  Existing groundwater wells would become de-stressed and take on the secondary function of backup systems when needed due to surface water shortages in the Colorado River Basin and other potential supply interruptions.

  Over one-third of homes in the rural Navajo Chapter communities of the "Gallup Water Commons" do not have running water, and the primary method of meeting water needs is collection and hauling of water in various sized containers from identified public water sources. Under COVID-19 public health orders, most Navajo water stations were closed. Hundreds of households turned to using public water stations in the City of Gallup.

  Between 2019 and 2021, the Gallup experienced a 6.7% increase in COVID related water demand. The increases were caused by increases of out-of-town uses. This difference, amounting to about 41 million gallons per year (3.4 million gallons per month), is equivalent to the production of one new well.

  This scenario only touches the surface of a deeper set of problems: the City's groundwater supply has been depleting year-by-year with no re-charge, and the City s existing wells are not adequate to meet projected demand in the immediate term and over the coming 5 to 7 years.

  All of the above is further complicated by the deepening of the extreme drought conditions plaguing the State, with the Gallup area among the hardest hit regions. Such conditions will only cause additional pressure on Gallup water supplies by users throughout the region.

  To make up this lost water due to extreme drought conditions, the City of Gallup is applying for funding for a single water well. The estimate construction cost of the well is $4,000,000.00. The New Mexico State Office of the State Engineer groundwater permits, the well sites and utility easement are already in place. Stake holders, State of New Mexico, Navajo Nation and USBR all support the project.

  Sections of the *Gallup/NGWSP Water Commons Drought Contingency Plan* are included in the Appendix *(at the end of this document).*

  The City of Gallup is clearly supported by an existing drought resiliency plan named "*Gallup/NGWSP Water Commons Drought Contingency Plan*". This grant award will assist in helping to restore trust with local communities by expanding lines of communication and improving relationships with local stakeholders which has a foundation of collaboration with McKinley County and the Navajo Nation Water Management.

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

  Yes, the "*Gallup/NGWSP Water Commons Drought Contingency Plan"* was developed with input from multiple stakeholder collaborative process. These stakeholder agencies included: McKinley County, NTUA, NWNM Council of Governments, Navajo Nation Water Management, NMSU, and ISC-OSE attended four Task Force Meetings. Their input and comments are included in the final *Gallup/NGWSP Water Commons Drought Contingency Plan* report.

- ***Does the drought plan include consideration of climate change impacts to water resources or drought?***
  Yes, our City of Gallup - *NGWSP Water Commons Drought Contingency Plan* includes climate change impacts to our water resources as shown in this plan and current McKinley County Extreme Drought Maps. Because of these extreme drought impacts, it is an absolutely critical Priority for the City of Gallup's *NGWSP Water Commons Drought Contingency Plan* is to Develop Additional Well Field/s.

- ***Describe how your proposed drought resiliency project is supported by and existing drought plan.***

  Yes, See the **Appendix,** to view pages from our "*Gallup/NGWSP Water Commons Drought Contingency Plan".* This new potable water well drought resiliency project is supported in this document section titled: Mitigation Actions. This is an absolutely critical Drought Resiliency Project as written in the "*City of Gallup's NGWSP Water Commons Drought Contingency Plan"* to Develop Additional Well Field/s.

- ***Does the drought plan identify the proposed project as a potential mitigation or response action?***

  Yes, Our City of *Gallup/NGWSP Water Commons Drought Contingency Plan* includes the essential Drought Mitigation Response Action for the City of Gallup's – *Gallup/NGWSP Water Commons Drought Contingency Plan* is to Develop Additional Well Field/s.

- ***Does the proposed project implement a goal or need identified in the drought plan?***

  Yes, Our City of *Gallup/NGWSP Water Commons Drought Contingency Plan* includes the absolutely critical Goal Need Identified in City of Gallup's – "*Gallup/NGWSP Water Commons Drought Contingency Plan"* to Develop Additional Well Field/s as an essential Drought Mitigation Response Action; especially, since NGWSP has been delayed over 5 or more years.

E.1.4. Evaluation Criterion D — Severity of Actual or Potential Drought Impacts to be addressed by the Project

(15 points)

- ***What are the ongoing or potential drought impacts to specific sectors in the project area if no action is taken:***

  Over one-third of homes in the rural Navajo Chapter communities of the "Gallup Water Commons" do not have running water, and the primary method of meeting water needs is collection and hauling of water in various sized containers from identified public water sources. The Navajo Nation and its Utility Authority maintain numerous such water stations, under COVID-19 public health orders, most of these stations were closed for extended periods of time to everyday water-haulers. Many hundreds of households now use public water stations in the City of Gallup.

  Between 2019 and 2021, the Gallup Regional Water System experienced a 6.7% increase in COVID related water demand. The increases were disproportionately caused by increases of out-of-town users. The City's engineering team projects that this upward trend will continue in the coming months and years, as existing supply sources struggle to keep up with regional water demands. This difference, amounting to about 41 million gallons per year 3.4 million gallons per month), is equivalent to the production of one new well.

  Gallup's and surrounding communities NGWSP surface water delivery is delayed for an unknown period of time. The entire area is dependent on groundwater until the surface water is available. This means that the unincorporated communities, like Williams Acres and Catalpa Hills will connect to the Gallup Regional Water System and will receive groundwater supplied by COG wells, will have to wait to receive essential wet running water. Interruptions with potable water to these business could possibly result in health risks; for example, during pandemic situation/s, and there could be potential shortages of drinking water supplies. All of the above is further complicated by the deepening of the extreme drought conditions plaguing New Mexico State, the Gallup area among the hardest hit regions. Such conditions will only cause additional pressure on existing Gallup water supplies by users throughout the region.

- ***Whether there are public health concerns or social concerns associated with current or potential drought conditions***

  COVID-19 and other Health concerns are at a critical level; especially, with the current threats to global health when fresh drinking water may not be available. Without this new ground water well grant award, there could be potential shortages of drinking water supplies that could worsen the effects of a global pandemic.

- ***Whether there are ongoing, past or potential, local, or economic losses associated with current drought conditions***

The City is struggling financially to ensure that its wells are operating because most of the submersible well pump assemblies only last about 3 to 5 years, and it costs about $200,000.00 each to return the well to service. The City postponed and newly anticipated surface water delivery is scheduled for the end of 2024. Given the undefined extension of time to construct and begin operation of the NGWSP, the City does not know when the surface water will arrive. Relying on the U.S. government assurances, the City has spent millions of dollars on the Navajo-Gallup Water Supply Project and has not drilled a production well in over 18 years. There is uncertainty in the existing groundwater production facilities because of lack of active production wells and the City is paying for the NGWSP, which leaves the City of Gallup with no funds for new well construction and limited funds for well maintenance. Without the Bureau of Reclamation's assistance, the City of Gallup cannot afford to pay for the surface water pipeline and drill 3460' deep wells that cost approximately $4 million each.

- ***Whether there are other drought-related impacts not identified above (e.g., tensions over water that could result in a water-related crisis or conflict).***

  Enormous Navajo Nation tribal tensions are currently building because NTUA and its water customers, expecting NGWSP water, have been delayed five years after initial delivery date schedule. This grant award will help to begin the process to restore trust with local indigenous communities, and improve water supplies for tribal and Gallup area rural communities.

- ***Describe existing or potential drought conditions in the project area:***

  As stated in the NIDIS Drought.gov – US Drought Monitor for June 2, 200 - Drought in New Mexico website: https://www.drought.gov/drought/documents/quarterly-climate-impacts-and-outlook-western-region-june-2020 : Heading into June, 73% of the western U.S. is in drought. Compared to the start of the water year Oct 1), this is more than a two-fold increase in drought area. Above-average temperatures, below-average precipitation, greater-than-normal evaporative demand, low soil moisture, and rapid snowmelt favored the worsening of drought conditions in many regions.

- ***Is the project in an area that is currently suffering from drought or which has recently suffered from drought? Please describe existing or recent drought conditions, including when and the period of time that the area has experienced drought conditions (please provide supporting documentation, [e.g., Drought Monitor, droughtmonitor.unl.edu]).***

  Yes - McKinley County New Mexico is currently suffering from D3 – Extreme Drought meaning livestock are suffering, Producers are selling herds, feed costs are high, emergency Conservation Reserve Program CR grazing is authorized, crop yields are low. Fire danger is extreme and Irrigation allotments are decreased.

- ***Describe any projected increases to the severity or duration of drought in the project area resulting from changes to water supply availability and climate change. Provide support for your response (e.g., reference a recent climate informed analysis, if available.***

  Widespread dry conditions are likely to continue and spread throughout the spring, especially in the Southwest. This poses major threats to the region, including increased risks of wildfires, parched rangelands, stressed irrigation systems, and crop failures.

  Reduced snowpack volumes, earlier snowmelt, and changing precipitation patterns – also linked to climate change – exacerbate the water stress induced by droughts. And for numerous individual events across the world, scientists have attributed the increased likelihood and severity of droughts to human-driven climate change.

  Major droughts were made worse by climate change, including in Texas 2011-2012), East Africa 2011), California 2013-2015), Kenya 2016-2017), and Cape Town 2018). Researchers found that human-caused climate change made the majority of the drought events studied more severe or more likely to occur. In Cape Town in particular, scientists suggest that human-driven climate change tripled the likelihood of the 2018 water crisis major impacts to the agricultural and ranching industries have been devastating. Like with other extreme weather events, the impacts of severe droughts disproportionately burden already disadvantaged communities.

  Agriculture: Water stress and increased temperatures lead to crop losses that can devastate farmers who are dependent on crop yields for their livelihoods. Increasingly dry rangeland also negatively impacts livestock production, as it becomes increasingly difficult to feed and hydrate large herds.

  Ecosystems: Drought can result in major fish kills as bodies of water dry up. They can also lead to pest outbreaks, declines in wildlife, and forest diebacks – all of which reduce the viability of key ecosystem services that we depend upon.

  Infrastructure: Outdoor recreation industries may see declines as a result of drought, and physical infrastructure can be damaged from shifting soil and moisture levels. Drought conditions are also likely to increase the risk and severity of destructive wildfires.

  US Economy: Droughts have resulted in $249.7 billion in damages since 1980, with an average of $9 billion in damages each year since 2010.

  The U.S. Southwest is projected to trend towards mega-drought periods – which can last two decades or longer – as climate change continues. For other regions of the country, such as the West Coast, rapid flips between droughts and floods are predicted. These abrupt changes will make it much harder to effectively balance water storage and flood management. There is also a concern of permanent drought.

  Drought and water deficits, which go hand in hand, are together projected to become the highest risk climate impact for 40% of US cities.

  We must prepare our communities and vulnerable populations – to deal with increased water stress.

Current U.S. Drought Monitor Conditions for New Mexico

Current | Last Week | Last Month

The U.S. Drought Monitor (USDM) is updated each Thursday to show the location and intensity of drought across the country. This map shows drought conditions across New Mexico using a five-category system, from Abnormally Dry (D0) conditions to Exceptional Drought (D4). The USDM is a joint effort of the National Drought Mitigation Center, USDA, and NOAA. Learn more.

The following state-specific drought impacts were compiled by the National Drought Mitigation Center. While these impacts are not exhaustive, they can help provide a clearer picture of drought in New Mexico.

D0 - Abnormally Dry — 86.4% of NM
- Soil moisture is low
- Fire danger increases

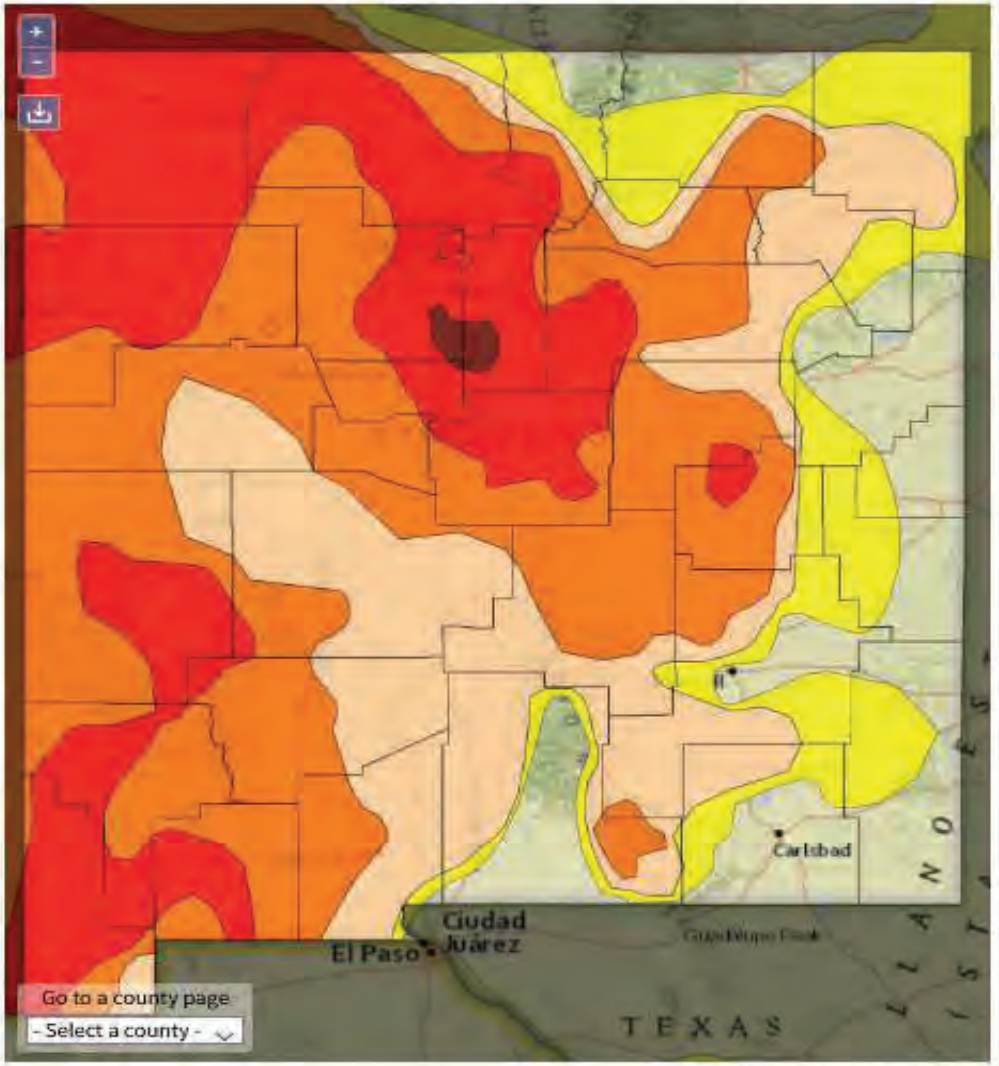
D1 - Moderate Drought — 75.7% of NM
- Livestock need supplemental feed and water
- Burn bans and firework restrictions begin

D2 - Severe Drought — 55.0% of NM
- Pasture yield is limited; producers sell livestock
- Irrigated crops are stunted; dryland crops are brown
- Abundance and magnitude of wildfires may increase; fuel mitigation practices are in effect

D3 - Extreme Drought — 22.5% of NM
- Livestock are suffering; producers are selling herds; feed costs are high; emergency Conservation Reserve Program (CRP) grazing is authorized; crop yields are low
- Fire danger is extreme
- Irrigation allotments decrease

D4 - Exceptional Drought — 0.4% of NM
- Federal lands begin to close for fire precautions; burn bans increase
- No surface water is left for agriculture; farmers use private wells
- Rio Grande and other large rivers are dry

Source(s): NDMC, NOAA, USDA



Updates Weekly – 08/24/21

1.8 Million people in New Mexico are affected by drought

33 counties with USDA disaster designations

62nd driest August was in 2021, over the past 127 years

55th wettest year to date was in 2021, over the past 127 years

BY LOCATION | LOCAL

Conditions for Gallup, NM (Mckinley County)

Get notified when conditions change

Sign Up for Alerts

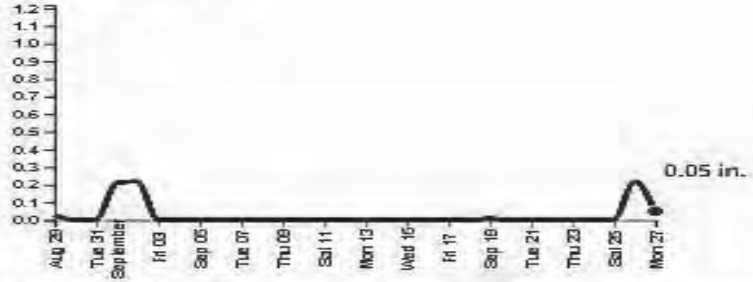
Go To New Mexico State Page

Go To Mckinley County Page

Precipitation (Total)

Data Available

No Data Available



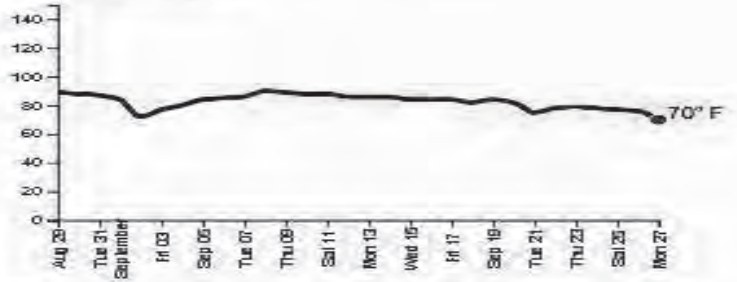
0.27 in. last 7 days ↓ 96% since last week ↓ 51% since last month

Learn more about these data

Temperature (Maximum)

Data Available

No Data Available



79° F last 7 days ↑ 6% since last week ↓ 3% since last month

Learn more about these data

Drought Indicators

Indicators are variables used to describe drought conditions (e.g., precipitation, temperature, streamflow, groundwater and reservoir levels, soil moisture, and snowpack). In order to get a complete picture of drought conditions, several drought indicators should be examined.

U.S. Drought Monitor
09/28/2021 - Updated Weekly

Precipitation (60 day)
09/27/2021 - Updated Weekly

Palmer Drought Severity Index
09/22/2021 - Updated Weekly

Streamflow (Closest Ranked Gauge)
09/29/2021 - Updated Daily

For maps and detailed analysis, visit the Climate Toolbox Water Watcher

E.1.5. Evaluation Criterion E—Project Implementation
(10 points)

Up to 10 points may be awarded based upon the extent to which the proposed project is capable of proceeding upon entering into a financial assistance agreement.

Applications that include a detailed project implementation plan (e.g., estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates) will receive the most points under this criterion. Please also see Section C.3.3 regarding eligible lengths of projects/or this NOFO.

- ***Describe the implementation plan of the proposed project. Please include an estimated project schedule that shows the stages and duration of the proposed work, including major tasks, milestones, and dates. Milestones may include, but are not limited to, the following: design, environmental and cultural resources compliance, permitting, construction/installation.***

  This project we have implemented immediately upon receipt of the grant funding. As discussed above all permits and easement are in place.

Project Schedule

Milestone / Task / Activity	Approx. Planned Start Date	Approximate Planned Completion Date
1.Environmental & Cultural Compliance	1/1/2022	4/30/2022
2 NMOSE Ground Water Permit	In-place	In-place
3.Aquire temporary access permit from adjacent property owners (private)	1/1/2022	2/28/2022
4. Prepare plans, specifications, and hydrology report, preliminary	10/1/2021	2/28/2022
5. Final contract documents ready for bidding	3/1/2022	3/30/2022
6. Advertise for competitive construction bids	4/1/2022	6/30/2022
7. Award contract	7/1/2022	8/31/2022
8. Well construction, pump test and disinfection	9/1/2022	3/31/2023
9. Well house construction, pump installation	4/1/2023	9/30/2023
10. Begin pumping water to Gallup Regional Water System	9/30/2023	10/01/2025
Grant Completion Date		10/01/2025

1. Environmental and Cultural clearance can be performed while the well drilling permit approval by the NM State Engineers Office is underway if needed. The time frame is

usually about 6 months to receive clearance and approval. All property is private, fee simple status.

2. NMOSE groundwater diversion permit for 2,600 ac-ft of water under G-80/SJ1491 is in place. The permit is needed to pump water from the well to the Gallup Regional Water System for municipal, commercial, industrial, irrigation and other uses.

3. Temporary access easement from the adjacent property owner will be required for the construction of the well. Well drilling rig, drill pipe, water tanks, circulation pit and other drilling procedures may require more property for the well construction than the City owns. Temporary easement is single occurrence needed only for the well construction and will be acquired by the well driller if needed.

4. Prepare preliminary construction plans, specification, and contract documents according to the grant agreement requirements for bidding, preference, and schedule.

5. Issue final construction contract documents with labor rates, permits and other necessary terms. Time for preliminary and final plans and specification is 6 months.

6. Advertisement for competitive construction bids will take about three 3 months with the bid opening on June 30, 2022.

7. Award contract to lowest responsive bidder and execute contract for construction. Time frame for contract negotiation and execution is 2 months.

8. Construct well, conduct pump test and disinfect well, time frame is six 6) months.

9. Construct well house and install well pump, schedule is six 6 months based on deep well submersible pump delivery time.

10. Begin pumping water to the Gallup Regional water system for municipal, commercial, industrial, irrigation and other uses.

Permits

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

Temporary access permits may be needed for the mobilization of the drill rig. These permits are the responsibility of the well driller.

DePauli Engineering & Surveying, LLC has obtained all needed permits for this grant application which is budgeted in this proposal. A NMOSE Groundwater Diversion Permit G-80/SJ1491 will be needed before water can be pumped to the City. Also a temporary access agreement for the well construction is needed from the adjacent property owner. To ensure an adequate water supply to the Gallup Regional Water System through 2030, two 2) new wells are proposed under the G-80/SJ-1491 permit and two 2 wells are proposed under G-22. These proposed wells along with water from the Twin Lakes Well should hold up the City's water supply until the surface water is available.

The *Gallup Ground Water Well - Professional Services, Design Construction* grant project will be in compliance with the National Environmental Policy Act NEPA), ESA, NHPA and all applicable state, federal and local environmental, cultural, resource protection laws and regulations including the Clean Water Act.

Currently, any discharges from the City of Gallup's Waste Water Treatment Plant are in compliance with its NPDES permit which was developed based on federal and state regulations.

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

  As described above, Report by Doctor John W. Shomaker Drawdown – "Addendum to Effects of Proposed Pumping from Westwater Canyon Aquifer in Yah-Ta-Hey Well Field, City of Gallup, New Mexico , Dated July 29, 2020.

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

  None Required

E.1.6. Evaluation Criterion E—Nexus to Reclamation

(10 points)

Up to 10 points may be awarded if the proposed project is connected to a Reclamation project or Reclamation activity. No points will be awarded for proposals without connection to a Reclamation project or Reclamation activity.

Describe the nexus between the proposed project and a Reclamation project or Reclamation activity. Please consider the following:

- ***Does the applicant have a water service, repayment, or O&M contract with Reclamation?***

  The City of Gallup currently has a Right of Capacity, Cooperative Funding and Repayment contract with the Bureau of Reclamation.

- ***If the applicant is not a Reclamation contractor, does the applicant receive Reclamation water through a Reclamation contractor or by any other contractual means?***

  Not currently– the Navajo Gallup Water Supply Project. NGWSP is currently in construction phase. This project will provide drinking water to the region while surface water from the NGWSP is delayed.

- ***Will the proposed work benefit a Reclamation project area or activity?***

  The Navajo-Gallup Water Supply Project, once constructed, will be a major infrastructure project, and will convey a reliable municipal and industrial water supply from the San Juan River to the eastern section of the Navajo Nation, southwestern portion of the Jicarilla Apache Nation, and the city of Gallup, New Mexico via about 280 miles of pipeline, several pumping plants, and two water treatment plants. The "*Gallup Ground Water Well – Professional Services, Design Construction"* grant award will assist to identify opportunities to resolve conflicts and expand capacity. This project will foster relationships with tribal stakeholder organizations advocating for balanced stewardship and use of public lands.

- ***Is the applicant a Tribe?***

  No – However, the *Gallup Ground Water Well – Professional Services, Design Construction* grant program benefits the Navajo and neighboring tribes who receive water from the City of Gallup.

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

  The Gallup Ground Water Well – Professional Services, Design & Construction project involves the NGWSP facility multi-phased project.

  Is the project in the same basin as a Reclamation project or activity?
  Will the proposed work contribute water to a basin where a Reclamation project is located?

  Yes – the *Gallup Ground Water Well – Professional Services, Design & Construction* grant project is in the same basin as the NGWSP and will contribute potable well water within the Reclamation project area of NGWSP. Because the NGWSP is delayed for at least 5 years, in the future, the NGWSP will convey a reliable municipal and industrial water supply from the San Juan River to the eastern section of the Navajo Nation, and the southwestern portion of the Jicarilla Apache Nation, and the city of Gallup but not now when the water is needed. The project is projected to cost $1.3 billion and requires decades to complete. The City of Gallup is repaying its portion of the project. Until then, Gallup continues to rely on groundwater mining for a water supply. The aquifers that Gallup draws from are rapidly depleting, on average of 200 feet in ten years, and most estimates expect water shortages for the city in the near future. These future water shortages should begin to be mitigated by this new water supply.

RESOLUTION OF
THE GALLUP CITY COUNCIL

RESOLUTION No. R2021-____

Approving grant application submission and if awarded, implementation of a US Department of the Interior (DOI) Bureau of Reclamation (USBR) WaterSMART Drought Response Program: Drought Resiliency Project Grant (R22AS00020)
Ground Water Well - Professional Services & Design

WHEREAS, the Water and Sanitation Department staff will prepare a federally-authorized *Ground Water Well - Professional Services & Design (*R) WaterSMART Water and Energy Efficiency grant application for FY2022 between the USBR and the City of Gallup to increase the production capacity and reliability of city water supplies in response to the delay in the delivery of surface water to the Gallup Regional Water System;

WHEREAS, the *Ground Water Well - Professional Services & Design* grant will fund the siting, hydrology, design and construction oversite phases costing approximately $4 million for new City of Gallup potable water wells which will provide water supply to the Gallup Region Water System in place of the anticipated surface water supply.

WHEREAS, Staff estimates that the proposed *Ground Water Well - Professional Services & Design* grant project completion time period will be completed within three years of signed contract award. After final construction, this potable water well performance measure - will be designed to produce approximately 2,170 acre-feet over a 10 year period, helping to provide water supply in lieu of surface water and to protect our residence from COVID 19 and other pandemic diseases especially, during times of drought;

WHEREAS, the *Ground Water Well - Professional Services & Design* grant proposal project costs are estimated at four million dollars ($4 million) for this project to be completed in three years. The U.S. DOI - USBR share is calculated at $2,000,000 per year over a period of three years. The City of Gallup cost share will be 50% of the total grant project costs, that will come from either a Water & Sanitation Department budget adjustment, New Mexico Water Trust Board Loan/Grant or other funding source;

NOW THEREFORE, BE IT RESOLVED that the Governing Body of the City of Gallup does hereby approve this grant submission, and if awarded, implementation of the *Ground Water Well - Professional Services & Design* USBR grant Funding Opportunity application and partnership between the City of Gallup and the US DOI Bureau of Reclamation.

PASSED, ADOPTED AND APPROVED this ___th_ day of October, 2021, in a duly called meeting of the Gallup City Council at which a quorum was present, at Gallup, New Mexico, by a vote of ____ in favor, ____ opposed, and ____ abstaining.

BY: _____
Louie Bonaguidi, Mayor
City of Gallup

ATTEST: _____
Alfred Abeita, City Clerk

Because of timing issues with Gallup City Council meetings – this draft Resolution will be submitted during our next available City Council Meeting to be officially approved and signed by our Mayor and City Council.

POINTS OF CONTACT

Project Manager

Elizabeth Barriga
Environmental Program Coordinator
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Gallup, NM 87305-1270
505-863-1393
505-726-1278
ebarriga@gallupnm.gov

City Manager

Marian Ustick – City Manager
City of Gallup
PO Box 1270
Gallup, NM 87305-1270
505-863-1205
505-726-1278
manager@gallupnm.gov

Bureau of Reclamation rant CONTACT

Attn: Mr. Gary Mcrae
Upper Colorado Basin
Regional Drought Coordinator
125 S. State St, Room 8100
Salt Lake City, UT 84138-1147
By email: gmcrae@usbr.gov
By phone: 801-524-3711
Or 801-524-3656

APPENDIX

DePauli Engineering Cost Estimate

Gallup Regional Water Supply

City of Gallup

Well No. 1

NMOSE: SJ-1491

Location : Section 32, T17N, R18W, N.M.P.M.

McKinley County, NM

Depth : 3460'

Casing : 13 ⅜" Dia.

Cost Summary :

A.	Well Drilling, Testing and Development	$2,965,639.58
B.	Building, Piping, Electrical and Controls	$602,434.13
C.	Well Pump Assembly Column Pipe, Electrical Cable	$321,038.25
D.	Contingency, Off Site Utilities, Access Permits	$110,888.04
	Total:	$4,000,000.00

Prepared By: DePauli Engineering & Surveying, LLC

307 S. 4th Street

Gallup NM, 87301

Date: September 24, 2021

COST ESTIMATE
CITY OF GALLUP, NEW MEXICO
GALLUP REGIONAL WATER SUPPLY
WELL No.1 - NMOSE: SJ-1491
WELL DRILLING, TESTING AND DEVELOPMENT
SEPTEMBER 2021

LOT I - WELL No. 1 WELL DRILLING, TESTING AND DEVELOPMENT

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and demobilization of Well Drilling Equipment, Access Road and required site work, (not including Hydraulic Fracture Water Storage) **for the Lump Sum Price of:**	LS	$250,000.00	$250,000.00
2	For 24" surface casing with cement, L=100' complete and in place **for the Lump Sum Price of:**	LS	$40,000.00	$40,000.00
3	For 61.0 lb., 13 3/8" O.D., casing, cemented in place including Pilot Hole, Geophysical Logs, reaming, casing and cement to lower Dakota complete and in place **for the Unit Price Per Linear Foot of:**	3100 LF	$280.00	$868,000.00
4	For 12 1/4" hole drilled from lower Dakota to TD complete and in place **for the Unit Price Per Linear Foot of:**	360 LF	$115.00	$41,400.00
5	For Geophysical Logs from lower Dakota to TD **for the Lump Sum Price of:**	LS	$25,000.00	$25,000.00
6	For installation and removal of submersible test pump including flow and water level measurement apparatus **for the Unit Price Per Each of:**	2 EA	$55,000.00	$110,000.00
7	For Pump Test as specified utilizing submersible test pump **for the Unit Price Per Hour of:**	50 HRS	$260.00	$13,000.00
8	For " Rathole" plug back with sand and cement plug as specified complete and in place **for the Lump Sum Price of:**	LS	$40,000.00	$40,000.00
9	For Westwater Hydraulic Fracture job as specified complete and in place **for the Lump Sum Price of:**	LS	$250,000.00	$250,000.00
10	For Westwater plug back with sand and cement plug as specified complete and in place **for the Lump Sum Price of:**	LS	$50,000.00	$50,000.00

LOT 1 - WELL No. 1 WELL DRILLING, TESTING AND DEVELOPMENT CONTINUED

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
11	For perforation of cemented 13 3/8" casing in Dakota utilizing jet methods complete and in place **for the Unit Price Per Lump Sum of:**	LS	$45,000.00	$45,000.00
12	For installation and removal of drill pipe and air pipe as required for Air Lift Test including flow measurement apparatus **for the Unit Price Per Each of:**	2 EA	$40,000.00	$80,000.00
13	For Air Lift Test including compressed air or Nitrogen as required **for the Unit Price Per Hour of:**	24 HRS	$350.00	$8,400.00
14	For Dakota Hydraulic Fracture job as specified complete and in place **for the Lump Sum Price of:**	LS	$200,000.00	$200,000.00
15	For plug removal and lower hole cleanup, complete and in place **for the Lump Sum Price of:**	LS	$50,000.00	$50,000.00
16	For 7" O.D. casing including blank and slotted sections and shale catcher complete and in place **for the Unit Price Per Linear Foot of:**	375 LF	$140.00	$52,500.00
17	For recovery test after Submersible Pump Test or Air Lift Test **for the Unit Price Per Hour of:**	56 HRS	$150.00	$8,400.00
18	For providing on-site water storage facility for "fracture" operations as specified complete and in place **for the Unit Price Per Thousand Gallons of Usable Capacity:**	300 THOU GAL	$250.00	$75,000.00
19	For water hauling to site from Yah-Ta-Hey Booster Station for "fracture" operations **for the Price Per Thousand Gallons of:**	150 THOU GAL	$500.00	$75,000.00

LOT 1 SUBTOTAL:	**$2,281,700.00**
TAX @ 8.3125%:	**$189,666.31**
TOTAL ESTIMATED CONSTRUCTION COST:	**$2,471,366.31**
DESIGN ENGINEERING & HYDROLOGY@ 10%:	**$247,136.63**
CONSTRUCTION MANAGEMENT @ 10%:	**$247,136.63**
TOTAL COST:	**$2,965,639.58**

COST ESTIMATE
CITY OF GALLUP, NEW MEXICO
GALLUP REGIONAL WATER SUPPLY
WELL No. 1 - NMOSE: SJ-1491
BUILDING, PIPING, ELECTRICAL AND CONTROLS
SEPTEMBER 2021

LOT 1 - Well No. 1 Well House and Yard Piping

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
1	For clearing, grubbing, earthwork, and site grading and access road construction as detailed on project drawings complete and in place **for the Lump Sum Price of:**	LS	$50,000.00	$50,000.00
2	For well house construction including interior station piping to a point 5' outside of station, piping to well head, and mechanical equipment as detailed complete and in place **for the Lum Sum Price of:**	LS	$135,000.00	$135,000.00
3	For yard piping including 12" well collector line, 12" prewash line, 6" gate valve, and station drain line as detailed on the plans with granular bedding and rock free native backfill, complete and in place **for the Lump Sum Price of:**	LS	$80,000.00	$80,000.00
4	For tie-in of yard piping to existing well collector lines as detailed on the plans with granular bedding and rock free native backfill, complete and in place **for the Lump Sum Price of**:	LS	$5,000.00	$5,000.00
5	For construction of new prewash outlet head wall as detailed complete and in place **for the Lump Sum Price of**:	1 LS	$10,000.00	$20,000.00
6	For new 6" thick gravel surfacing over non woven fabric on new and existing gravel pad and access road as detailed on project drawings complete in place **for the Unit Price per Square Yard of:**	800 SY	$28.00	$22,400.00
7	For chain-link security fencing (6' high) including personnel gate (3' wide) and vehicle gates (16' wide) complete and in place **for the Unit Price per Linear Foot of:**	300 LF	$37.00	$11,100.00
8	For site electrical complete (SCADA systems and equipment and programming not included) including switch gear, cabinets, control wiring, communication wiring, secondary conduit, primary conduit, secondary conductors, transformer pad, electrical pedestal and hotbox as required by the City complete and in place **for the Lump Sum Price of:**	LS	$91,000.00	$91,000.00

LOT 1 - S Well No. 1 Well House and Yard Piping

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
9	For 3 phase primary electrical extension and transformer work by the City of Gallup. This amount is an allowance for totaling bid. **The actual amount will be based on approved City invoice.**	Allowance	$18,000.00	$18,000.00
10	For programming and furnishing SCADA equipment by City Contractor as required to bring well data into existing City Scada system for monitoring and supervisory control. This amount to be used for totaling bid. **Actual amount to be based on approved invoice.**	Allowance	$25,000.00	$25,000.00
11	For materials testing by an independent testing lab. This allowance amount must be used for totaling bid. **Actual amount based on approved invoices:**	Allowance	$6,000.00	$6,000.00

LOT 1 SUBTOTAL:	**$463,500.00**
TAX @ 8.3125%:	**$38,528.44**
TOTAL ESTIMATED CONSTRUCTION AMOUNT:	**$502,028.44**
DESIGN ENGINEERING, & HYDROLOGY @ 10%:	**$50,202.84**
CONSTRUCTION MANAGEMENT @ 10%:	**$50,202.84**
TOTAL COST:	**$602,434.13**

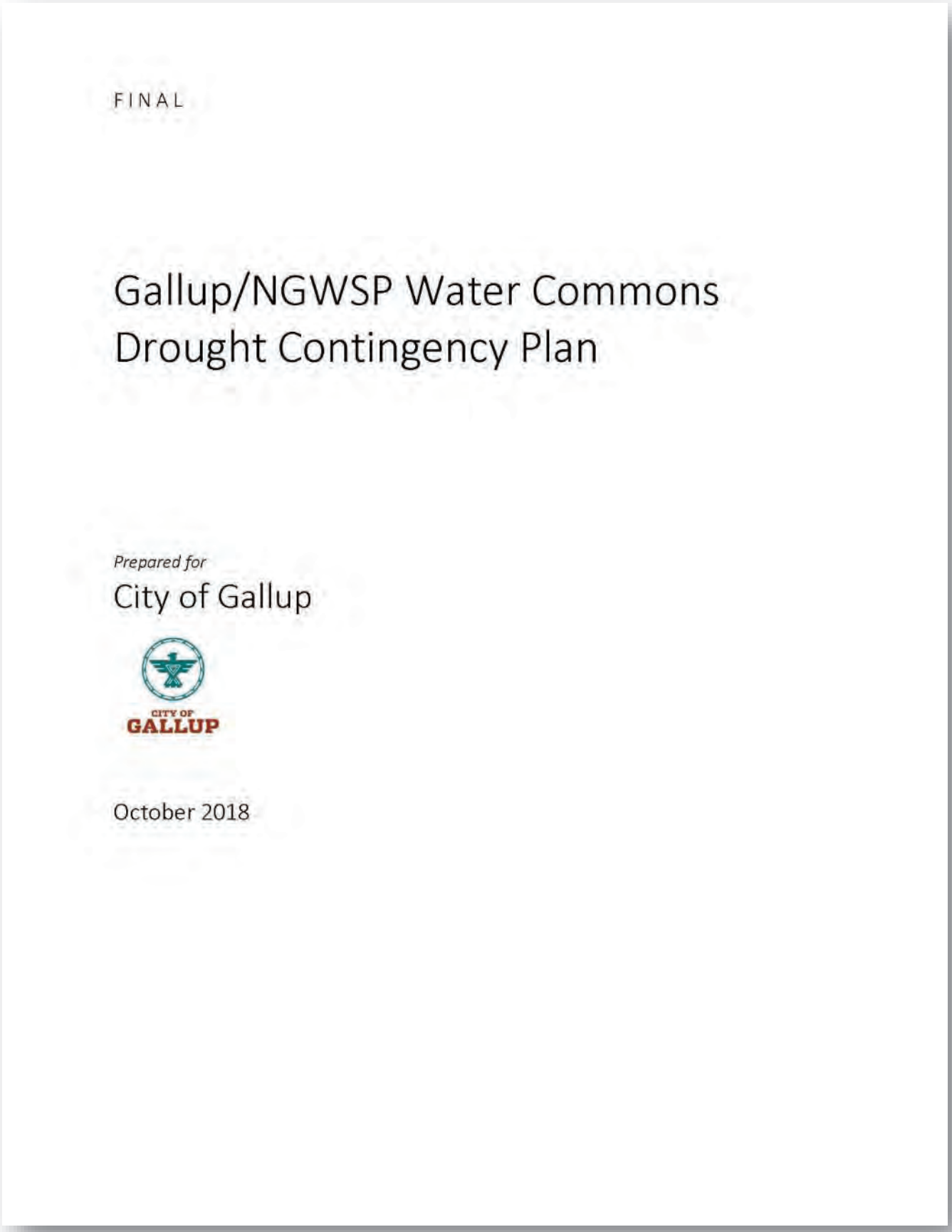
COST ESTIMATE
CITY OF GALLUP, NEW MEXICO
GALLUP REGIONAL WATER SUPPLY
WELL No. 1 - NMOSE: SJ-1491
WELL PUMP ASSEMBLY COLUMN PIPE, ELECTRICAL CABLE
SEPTEMBER 2021

Lot 1 - Well No. 1 Pump Equipping

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNIT PRICE	AMOUNT
1	For furnishing and installing submersible pump assembly, conductors, and appurtenances complete and in place as specified **for the Lump Sum Price of:**	LS	$125,000.00	$125,000.00
2	For furnishing and installing well head including discharge pipe connection, column pipe crossover, and ports for power cable, air lines and transducer cable, bearing flanges and lifting lugs as detailed complete and in place for the **Lump Sum Price of:**	LS	$30,000.00	$30,000.00
3	For furnishing and installing 5" O.D. J-55 column pipe, two (2) check valves, couplings, and centralizers complete and in place as specified **for the Unit Price per Linear Foot of:**	2000 LF	$35.00	$70,000.00
4	For furnishing and installing stainless steel air lines with well pump as specified, demonstrated to be in working order complete and in place for the **Lump Sum Price of:**	LS	$10,000.00	$10,000.00
5	For furnishing and installing Dynotek Slimline transducer with 500 PSI pressure range and extra duty cable or equal as specified, complete and in place for the **Lump Sum Price of:**	LS	$12,000.00	$12,000.00

LOT 1 SUBTOTAL:	**$247,000.00**
TAX @ 8.3125%:	**$20,531.88**
TOTAL ESTIMATED CONSTRUCTION AMOUNT:	**$267,531.88**
DESIGN ENGINEERING & HYDROLOGY @ 10%:	**$26,753.19**
CONSTRUCTION MANAGEMENT @ 10%:	**$26,753.19**
TOTAL COST:	**$321,038.25**

Sections of Gallup/NGWSP - Drought Contingency Plan



FINAL

Gallup/NGWSP Water Commons Drought Contingency Plan

Prepared for

City of Gallup

CITY OF GALLUP

October 2018

Figures 2-1 through 2-3 show the information used to populate Table 2-2 for each indicator.

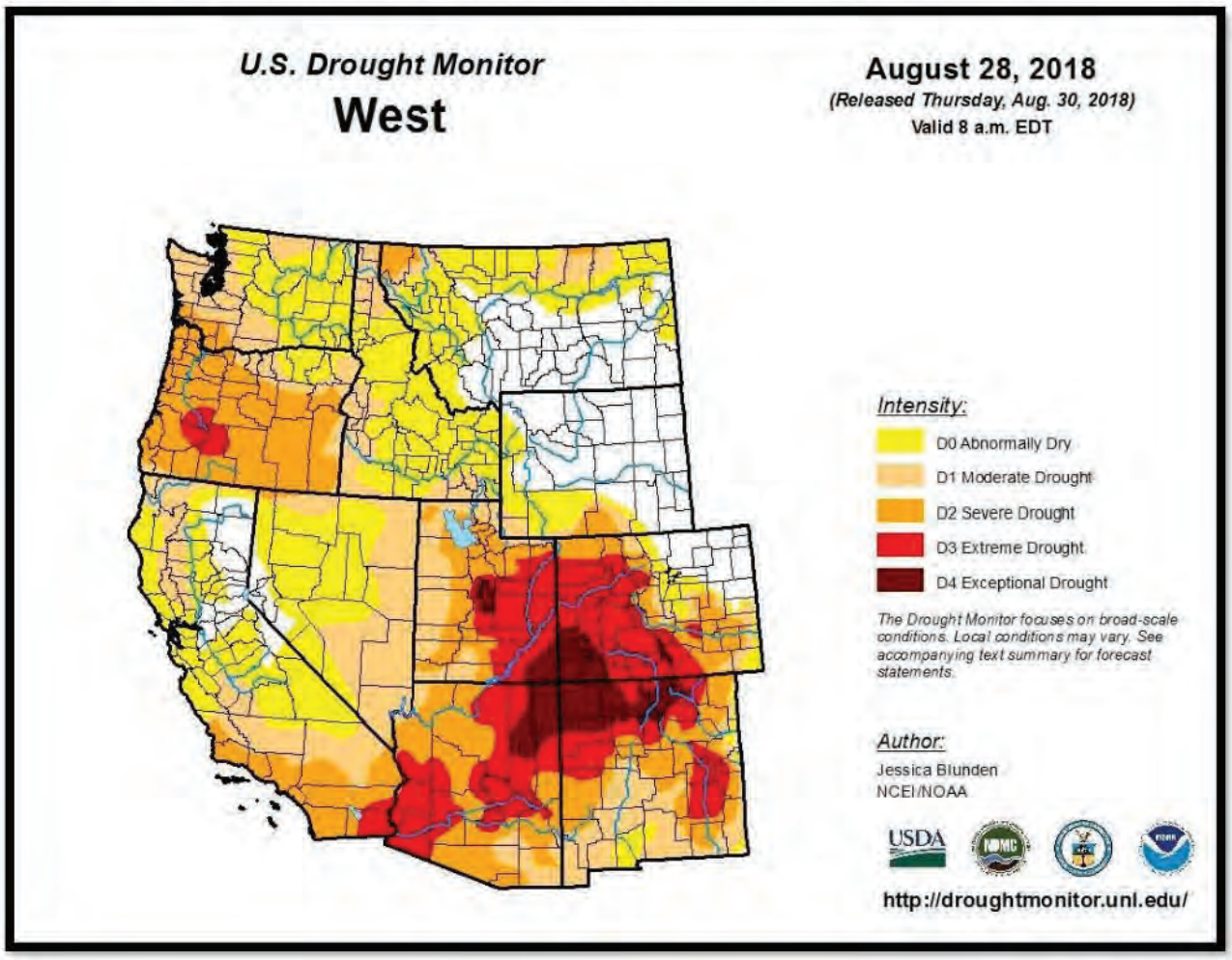


Figure 2-1. U.S. Drought Monitor
Used in Table 2-2 Example

Table 4-1. Mitigation Actions

Priority	Mitigation Action	Positive	Negative
1	Construct NGWSP	• Long-term sustainable supply	• Project completion not in control of City (BOR to construct water treatment plant and portion of conveyance system) • Water allocation per year not in control of City
2	Develop additional well fields/purchase ground water rights	• City has full control of asset • Increases overall supply	• Declining aquifer levels • Sustainability
3	Direct potable reuse (DPR)	• City has full control of asset • Reduces use of groundwater supply	• Long-term operation and maintenance (O&M) cost • Public perception
4	Indirect potable reuse (IPR)	• City has full control of asset • Reduces use of groundwater supply	• Long-term O&M cost • Public perception
5	Aquifer storage and recovery and/or above-ground storage of excess NGWSP allocation	• Increase supply in drought years	• Regulation road blocks
6	Water rate structure to encourage water conservation (i.e., inverted block rate structure)	• Reduces use of groundwater supply	• Public perception • Reduced revenue
7	Meter condition assessment and replacement program	• Additional revenue, reduces non-revenue water use	•
8	Leak detection of existing distribution system	• Reduces use of groundwater supply	•
9	Water conservation rebate programs (i.e., incentives to replace high use fixtures, reduce irrigated turf, etc.)	• Reduces use of groundwater supply • If targeted, may reduce specific drought vulnerability	• Reduced revenues
10	Water Conservation Public Outreach/ Education	• Reduces use of groundwater supply	• Reduced revenues
11	New construction standards (grey water reuse, landscape restrictions, sprinkler layout, etc.)	• No cost to City • Reduces use of groundwater supply	• Added financial burden to residents/businesses • Reduced revenues
12	Rainwater Harvesting	• Reduces use of groundwater supply for outdoor watering	• Reduced revenues

Groundwater pressures (levels) could be tracked to determine the impacts of mitigation actions. Tracking the overall demand or gallons per capita per day (gpcd) of the City's system could also accomplish the same goal.

Table 2-1. Template for Drought Conditions Monitoring Table

Date completed:				
		Indicators		
Month/Year:		U.S. Drought Monitor (Weekly Update)	Palmer Drought Severity Index (PDSI)	West Region Climate Center Standardized Precipitation Index (SPI)
Website		http://droughtmonitor.unl.edu/	http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif	https://wrcc.dri.edu/cgi-bin/spiFmap.pl?spi06
Input Determined Drought Stage from Information on Websites (in cells to right)				
Drought Stage	Possible Impacts	Triggers		
Stage 0 – No Drought	No Indicators showing a drought condition.	None	>0	> -0.74
Stage 1 – Potential for Drought	Current conditions indicate the potential for upcoming drought conditions.	D0	-1.9 to 0	-1.24 to -0.75
Stage 2 – Moderate Drought	Streams, reservoirs, or wells low. Some water shortages developing. Voluntary water-use restrictions requested.	D1	-2.0 to -2.9	-1.99 to -1.25
Stage 3 – Severe Drought	Water shortage common. Water restrictions imposed.	D2	-3.0 to -3.9	-2.99 to -2.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Calculated Drought Stage				

ADDENDUM TO

DRAWDOWN EFFECTS OF PROPOSED PUMPING FROM WESTWATER CANYON AQUIFER IN YAH-TA-HEY WELL FIELD, CITY OF GALLUP, NEW MEXICO (1983)

by

John W. Shomaker, Ph.D.
Annie M. McCoy
Jake Baggerman

John Shomaker & Associates, Inc.
Albuquerque, New Mexico

Prepared for

City of Gallup, New Mexico

August 1, 2020

ADDENDUM TO

DRAWDOWN EFFECTS OF PROPOSED PUMPING FROM WESTWATER CANYON AQUIFER IN YAH-TA-HEY WELL FIELD, CITY OF GALLUP, NEW MEXICO (1983)

INTRODUCTION

On October 14, 1981, the City of Gallup filed an application to appropriate water from the Westwater Canyon Member of the Morrison Formation, and associated units, in the vicinity of Yah-Ta-Hey, New Mexico, under Office of the State Engineer (OSE) File Nos. G-80 and SJ-1491. A technical report with predictions of the effects of exercise of the applied-for permit (Shomaker, 1982, revised 1983) was submitted soon after the filing. The application has not been acted upon. The City has modified the application, and is now asking for approval. In considering the application, the OSE has requested some additional information. The purpose of this addendum to the original technical report is to provide that additional information. For the discussion in this report "G-80" will refer to both File Nos. G-80 and SJ-1491.

1981 APPLICATION AND 1983 TECHNICAL REPORT

Original Application

The October 14, 1981 application contemplated diversion of 5,600 ac-ft/yr from up to14 wells, in any combination, from the "Dakota Sandstone and/or the Westwater Canyon Member of the Morrison Formation." Thirteen well locations are in the Gallup Underground Water Basin, and one is in the San Juan Underground Water Basin but very close to the other wells. The application was advertised, and was protested, but all of the protests have been withdrawn. The locations and approximate depths of the proposed wells are as shown in Table 1.

Modification of the Original Application

By letter dated May 29, 2020, the City of Gallup reduced the total amount of water applied for to 2,600 ac-ft/yr. The City does not expect to need the full 2,600 ac-ft/yr amount for a number of years, however, and has provided a pumping schedule that represents the maximum annual amounts for the 40 years following issuance of the permit. These amounts, which the City accepts as limits that may be included in permit conditions, are:

- Years 1-5: 1,000 ac-ft/yr.
- Years 6-10: 1,500 ac-ft/yr.
- Years 11-20: 2,000 ac-ft/yr.
- Years 21-40: 2,600 ac-ft/yr.

The technical report (Shomaker, 1983) was first submitted to the State Engineer on November 1, 1982, and the revised technical report was submitted on February 4, 1983. The report includes a description of the geologic and hydrologic setting, and drawdown predictions for two pumping schedules, but it was completed before any successful aquifer test of the Dakota-Westwater Canyon sequence had been completed in the vicinity of the proposed wells, as will be discussed further below.

Table 1. Summary of proposed well locations, depths, and approximate available drawdown.

Well No. in Application	State Engineer Well No.	Township North	Range West	Sec.	Q64	Q16	Q4	Q4	Q16	Q64	Depth, ft	Basin	X_UTM83	Y_UTM83	Approximate GL elev., ft	Approximate depth to top of liner, ft	Approximate available drawdown, ft
1	G-80	16	18	17	NE	NE	NW	1	2	2	3,100	Gallup	158729	3948562	6,640	2,725	2,063
2	G-80-S	16	18	7		SW	SE	4	3		3,350	Gallup	157425	3948942	6,550	2,975	2,403
3	G-80-S-2	16	18	7	NE	NE	NE	2	2	2	3,200	Gallup	157997	3950208	6,600	2,624	2,203
4	G-80-S-3	16	18	7	NW	NW	NW	1	1	1	3,250	Gallup	156622	3950261	6,620	2,875	2,233
5	G-80-S-4	16	18	7	SW	SW	SW	3	3	3	3,350	Gallup	156542	3948885	6,580	2,975	2,373
6	SJ-1491	17	18	32	SE	SE	SE	4	4	4	3,000	San Juan	158909	3952180	6,500	2,625	2,103
7	G-80-S-5	17	18	32	SW	SW	SW	3	3	3	3,450	Gallup	157587	3952256	6,755	2,900	2,298
8	G-80-S-6	16	18	17	SE	SE	SE	4	4	4	3,050	Gallup	159447	3947152	6,750	2,675	1,903
9	G-80-S-7	16	18	17	SW	SW	SW	3	3	3	3,200	Gallup	158044	3947209	6,620	2,825	2,183
10	G-80-S-8	16	19	13	NW	NW	NW	1	1	1	3,050	Gallup	154854	3948817	6,560	2,675	2,093
11	G-80-S-9	16	19	13	SW	SW	SW	3	3	3	3,000	Gallup	154815	3947378	6,520	2,625	2,083
12	G-80-S-10	16	19	13	SE	SE	SE	4	4	4	3,300	Gallup	156231	3947311	6,630	2,925	2,273
13	G-80-S-11	16	18	19	SW	SW	SW	3	3	3	3,000	Gallup	156389	3945625	6,620	2,625	1,983
14	G-80-S-12	16	18	19	SE	SE	SE	4	4	4	3,050	Gallup	157752	3945579	6,730	2,675	1,923

UTM coordinates are for center of 10-ac tract.
Approximate available drawdown assumes current water-level elevation is 5,963 ft; value is GL elevation minus 5,963 ft, less total depth minus 360 ft (top of Westwater Canyon).
Depths to top of liner in Wells G-80-S-2 and G-80-S-5 (Lewis and Allan wells) are actual.

SPECIFIC STATE ENGINEER REQUESTS

The OSE staff have made four specific requests for information relating to the G-80 and SJ-1491 application. Each of the requests is repeated below, followed by the responses to it.

1. Please confirm or amend that the 14 wells described in application G-80 are capable of producing a combined diversion of 2,600 acre-feet per annum (afa) over a 40-year period.

The response to this request is based on the pumping schedule put forward by the City of Gallup and described above, rather than on a constant annual withdrawal of 2,600 ac-ft.

Proposed Well Construction and Available Drawdown

All of the proposed wells would be completed in the Dakota Sandstone and the Westwater Canyon Member of the Morrison Formation, at approximate total depths projected to range from 3,000 to 3,450 ft (Table 1). Well construction is proposed to be similar to that of the existing Wells G-97-S-8 (G-80-S-2) and G-97-S-9 (G-80-S-5). The 13-3/8-in. OD casing would be set and

cemented to the bottom of the Dakota Sandstone, and 12-1/4-in. hole drilled through the Westwater Canyon Member of the Morrison Formation to total depth. The Westwater interval would be treated, developed, and tested, then temporarily plugged back to the bottom of the casing. The Dakota interval would be shot-perforated, treated, and tested. The 12-1/4-in. hole would be cleaned out, and about 375 ft of 7-in. OD perforated liner set through the Morrison interval. The depth to the top of the 7-in. liner would be 2,625 to 3,075 ft. The maximum drawdown would be somewhat greater than that of the top of the liner; submersible pumps up to 500 hp that will run in 7-in. casing are available, so that a pumping level deeper than the top of the 7-in. liner could be attainable. The drawdown available in each well, as shown in Table 1, is assumed to be the difference between the non-pumping water level and the top of the Westwater Canyon Member, but could be somewhat greater.

The efficiencies of the proposed wells are expected to be very high, probably more than 100 percent if calculated as the ratio of observed specific capacity to theoretical specific capacity (based on aquifer transmissivity and storage coefficient determined during testing). Experience with other deep sandstone-aquifer wells in the San Juan Basin has indicated high efficiency with only conventional well-development, and in the case of the G-80 wells, both the Dakota and Westwater Canyon zones will be hydraulically fractured, increasing the effective radius of each well. For this reason, it is not necessary to apply a well-efficiency adjustment to calculated drawdowns.

The most recent water-level elevations are 5,875 ft for the Lewis well (G-97-S-8) and 6,050 for the Allan well (G-97-S-9), based on the measurements shown in Table 2. Taking the average of the two, at 5,963 ft elevation, as roughly representative of the proposed wells, would lead to a total available drawdown range of roughly 1,900 to 2,400 ft (Table 1).

Modifications of the 1983 groundwater flow model: Predictions of well capacities and drawdowns based on a groundwater flow model were included in the 1983 technical report, but the groundwater model described in the report was completed in January 1983, before any successful pumping test of Westwater Canyon wells had been completed in the Yah-Ta-Hey field. Estimates of the aquifer characteristics in that model were based on information from outside the area. The original well in the field, the Muñoz 1, was drilled in 1967 and penetrated the entire sequence, but testing of the Westwater Canyon interval was unsuccessful. The successor well Muñoz 1A (G-97-S-17) was completed in both the Gallup Sandstone and the Dakota-Westwater sequence, then plugged back to just below the Gallup in 1972. Since the 1983 report, the Lewis 1 (G-97-S-8) and Allan 1 (G-97-S-9) wells have been completed and tested, and the information from those tests has been used to modify the 1983 groundwater model for the purposes of this report, as discussed below.

Table 2. Summary of pumping-rate and water-level data, Allan and Lewis wells (G-97-S-9 and G-97-S-8, respectively).

Allan Well, G-97-S-9					Lewis Well, G-97-S-8			
Approx.	Pumping	Depth to water, ft			Approx.	Pumping	Depth to water, ft	
date	rate, gpm	non-pumping	pumping		date	rate, gpm	non-pumping	pumping
11/13/1985	--	450	--		10/8/1983	150	219	--
1986	252	400	1,100		10/11/1990	--	751	--
6/15/1986	280	400	--		10/11/1990	--	689	--
11/6/1990	--	553	--		10/26/1990	--	819	--
1/21/1993	--	461	--		3/17/1991	--	795	--
3/19/1993	--	468	--		8/7/1991	--	752	--
4/2/1993	--	478	--		9/5/1991	--	680	--
4/2/1993	--	592	--		11/1/1991	--	680	--
7/24/1993	--	617	--		11/1/1991	--	646	--
12/27/1993	--	497	--		11/15/1991	--	557	--
3/22/1994	--	610	--		12/18/1992	--	488	--
11/18/1994	--	614	--		3/28/1993	--	458	--
11/7/1995	--	521	--		9/1/1993	--	499	--
5/22/2001	350	608	--		3/6/1994	--	779	--
11/8/2005	--	705	--		4/17/1994	--	658	--
2006	--	--	1,622		5/8/1995	--	670	--
2013	325	--	--		7/9/1996	--	556	--
6/1/2016	--	705	--		11/3/2003	--	634	--
8/20/2016	--	--	1,530		11/4/2011	175	--	2083
					9/24/2012	175	801	--
					7/16/2013	175	--	2050

Predicted Drawdowns in Production Wells

Revised aquifer characteristics: The test of the Lewis well, completed in October of 1983, described by Sterling and Mataya (1983), is difficult to interpret. The transmissivity of the aquifer sequence was estimated at 120 gpd/ft, or 16 ft^2/day, from the recovery plot, but the short-term specific capacity of the well, at 0.12 gpm per foot of drawdown, is greater than the theoretical value for a range of specific storage values for confined aquifers from 1×10^{-6} to 2×10^{-6}, and the total aquifer thickness of 388 ft. Transmissivity interpreted from the drawdown plot was significantly higher, at 144 gpd/ft, but specific capacity was still higher than the theoretical. The well is likely to be highly efficient, but efficiency is probably not as high as 100 percent. Assuming 90-percent efficiency, and the combination of a transmissivity of 195 gpd/ft (26 ft^2/day) and a specific storage of 2×10^{-6} per foot, leads to a specific capacity of 0.12 gpm per foot, as was observed.

Testing of the Allan well was completed in 1986 (Sterling and Mataya, 1986). Transmissivity was estimated at 619 gpd/ft, or 83 ft^2/day. The 24-hour specific capacity was 0.38 gpm per foot, close to the theoretical value of 0.39 gpm per foot for a transmissivity of 619 gpd/ft and a specific storage of 2×10^{-6} per foot applied to the full thickness of the aquifer sequence. The Allan well was developed by hydraulic fracturing, but the volumes and pressures were not

sufficient to create a significant improvement in specific capacity (see Sterling and Mataya, 1986, p. 4).

For the purposes of this addendum, the 1983 groundwater-flow model was converted from the Illinois State Water Survey modeling code (Prickett and Lonnquist, 1971) to the USGS MODFLOW platform (see, e.g., McDonald and Harbaugh, 1988) in general use today, using Groundwater Vistas software. The model grid and, apart from the change in aquifer properties in the well-field area, the aquifer properties and boundary conditions, are the same as in the 1983 model. Leakage from the overlying thick, low-permeability beds of the Mancos Shale is represented slightly differently mathematically as between the Prickett and Lonnquist model and MODFLOW.

The revisions of the 1983 model in terms of aquifer characteristics were limited to the zone that includes the well field, as follows: transmissivity was reduced from 1,000 gpd/ft (134 ft^2/day) to 407 gpd/ft (55 ft^2/day), the average of the Lewis and Allan tests as discussed above. Storage coefficient was increased to the value consistent with the observed specific-capacity, also as discussed above, at 0.0008. Leakance, represented by the MODFLOW variable VCONT, was set at 8.3×10^{-8} /day. This value comes from the calibrated regional model of Shomaker (1995).

Historical drawdowns within the well field: Table 2 summarizes the information available as to pumping rate, non-pumping depth to water, and pumping water level for the Allan (G-97-S-9) and Lewis (G-97-S-8) wells since the wells were new. The water levels include values scaled from graphs in the Well Production Planning Report by Sterling and Mataya (1998, appendix 3), and information provided by DePauli Engineering in 2020. The data underlying the graphs from Sterling and Mataya were not found; the precision of the scaled dates is likely to be about a month, and that of the water-level measurements is probably about 1 ft.

Predicted drawdowns in individual G-80 wells: The grid-dimensions of the revised model are too large for predictions of drawdowns within the individual producing wells. The OSE Theis program (Barroll, 1994) was operated, using the aquifer properties for the well field area discussed above, and two hypothetical north-south no-flow boundary conditions, one at about 10 miles from the field on the east, and the other about 11 miles to the west, to represent the limits of the Morrison Formation, to estimate the drawdowns in the wells within the well field. The calculations assume both (1) that pumping from the Lewis and Allan wells would continue to provide 80 percent of the water pumped under File No. G-97 as they have since 1999 (Table 3), and that the total of 492 ac-ft/yr would be pumped from all wells under G-97 each year, so that the Allan well would produce 252 ac-ft/yr and the Lewis well would produce 142 ac-ft/yr; and also (2) that the remaining 12 wells applied for under File No. G-80 would provide up 217 ac-ft/yr each, for the total of 2,600 ac-ft/yr after the 20th year. This pumping scenario contemplates a total of 2,994 ac-ft/yr from the 14 wells after the 20th year. New wells were added to the field according to a hypothetical schedule provided by DePauli Engineering, and the pumping under the G-80 permit was divided equally among them.

Table 3. Annual production from wells under File No. G-97, 1999-2019.

	SF-10, G-97-S-6, ac-ft	SF-11, G-97-S-7, ac-ft	SF-17, G-97-S-4, ac-ft	Lewis Well, G-97-S-8, ac-ft	Allan Well, G-97-S-9, ac-ft
1999				148.66	238.60
2000	106.86	88.07		218.26	310.08
2001	155.91	193.49	118.97	124.95	210.67
2002	233.07	209.06	60.35	168.90	222.79
2003	185.14	126.64	50.08	74.17	281.23
2004	224.25	120.17	10.28	112.58	410.85
2005	200.16	3.27	165.69	128.42	219.04
2006	264.5	0	22.81	155.56	213.63
2007	235.91	0	0	64.61	234.52
2008	197.24	0	72.81	54.87	180.26
2009	208.71	0	24.18	64.87	202.05
2010	163.71	0	117.78	32.39	256.82
2011	172.15	0	57.94	160.09	96.34
2012	119.02	0	59.24	120.58	178.00
2013	89.91	0	225.01	67.09	317.55
2014	126.45	0	149.22	194.62	45.04
2015	180.83	0	215.89	169.26	240.00
2016	111.17	0	188.49	125.06	324.25
2017	249.78	0	78.36	86.76	139.24
2018	64.25	0	321.57	119.88	189.90
2019	106.87	0	311.18	149.14	90.48

It is expected that the performance of individual wells will vary significantly from the performance predicted by the use of average values for aquifer characterictics across the well field, and therefore that some wells will produce more than 217 ac-ft/yr and some will produce less. This analysis should not be construed as implying a maximum annual production amount from any of the wells.

The average available drawdown, from recent conditions, for the 12 new wells (excluding the Lewis and Allan wells) is about 2,135 ft (Table 1). The range of the OSE Theis model-calculated drawdowns at the end of 40 years in the 12 new wells is 2,041 ft to 2,411 ft, and the average is about 2,222 ft.

These predicted drawdowns are slightly more than the available drawdown to the top of the Westwater Canyon Member in many of the G-80 wells after about 40 years, but the predictions do not take into account several important factors that would lead to smaller drawdowns. These are:

- The Navajo-Gallup Water Supply Project will supply surface water to Gallup, and will be Gallup's primary water supply once it is in operation. Pumping under the G-80 permit will then be less than the permitted amount.

- The new wells will be developed by hydraulic fracturing, with the Dakota and Westwater zones treated separately. It is expected that much greater injection rates and pressures will be applied than were used in the development of the Allan well, and that the resulting increase in effective radius will result in increase of the specific capacity of the well. Fracturing near the well that leads to an equivalent increase in the effective radius by as little as 3 ft would reduce the 24-hour drawdown at 134 gpm (the average rate to produce 2,600 ac-ft/yr from 12 wells) by more than 100 ft.
- The Theis-equation drawdown predictions do not account for leakage into the aquifers from above and below. Shomaker (1995) has shown that leakage from even the very low-hydraulic-conductivity Mancos Shale above the Dakota, and the Recapture Shale Member of the Morrison Formation below the Westwater Canyon, will provide a significant part of the water pumped from the Dakota and Westwater over time. This would have the effect of reducing the long-term drawdowns in the wells significantly.
- Pump settings can be deeper than the tops of the 7-in. liners in each well, and can be as deep as some point within the Westwater Canyon Member without compromising the ability to cool the pump motors by upward flow from below the motors. Oilfield pumps are available that will run in 7-in. casing, and no shroud would be required as long as the velocity of water passing the pump motor is sufficient for cooling, as would be the case if most of the production comes from the Westwater.

It is expected that there will be significant variation in performance from well to well, as indicated by the tests of the Lewis and Allan wells, but on an average basis the proposed wells are likely to have sufficient capacity to provide the water contemplated in the pumping schedule, up to 2,600 ac-ft/yr, for 40 years, although some wells might require a pump setting within the 7-in. liner in later years. Pumping of less than the full amount shown in the pumping schedule in any year would have the effect of extending the time that the wells can produce 2,600 ac-ft/yr.

2. Because wells G-97-S-8 and G-97-S-9 are proposed as points of diversion under pending application G-80 (advertised as G-80-S-2 and G-80-S-5, respectively), please confirm the production capability of these two wells over a 40-year period. Please estimate how much of the 2,600 afa these wells could produce on top of the 492 afa they are diverting under permit G-97 over a 40-year period.

The pumping schedule used in analysis of drawdowns in wells within the well field, discussed above, includes both the pumping from the two existing wells under File No. G-97 at 80 percent of the full G-97 diversion amount, and pumping of up to 2,600 ac-ft/yr from the applied-for G-80 wells. The estimated available drawdown in Well G-97-S-8 (G-80-S-2) is 2,203 ft (Table 1). The estimated 40-year drawdown under that pumping schedule described above is 2,229 ft. The estimated available drawdown in Well G-97-S-89 (G-80-S-5) is 2,298 ft (Table 1). The estimated 40-year drawdown for that well under the pumping schedule is 2,206 ft. Recognizing the factors that will increase specific capacity, as discussed above, the two existing G-97 wells can continue to produce 80 percent of the full G-97 right for 40 years, while the other twelve G-80 wells are likely to be able to produce the water contemplated in the pumping schedule, reaching the entire 2,600 ac-ft/yr after the 20th year, under File No. G-80.

Although the drawdown calculations described above are based on the assumption that all pumping from existing Wells G-97-S-8 (G-80-S-2) and G-97-S-89 (G-80-S-5) is assigned to File No. G-97 et al., that will not necessarily be the case during actual operation. Gallup will report

pumping from these two wells, after a G-80 permit is issued, under either G-97 or G-80, or a combination of both, as it finds appropriate.

3. Please confirm or amend this report to include the impacts of pumping the fully exercised 2,600 afa over a 40-year period, including impacts to wells of other ownership based on the 2017 Morrison Criteria considering existing pumping.

Table 4 lists Dakota-Westwater wells shown in the OSE WATERS database that are within the area of interest and associated with rights senior to the G-80 application. For these wells known, or expected, to produce from the Dakota-Westwater Canyon sequence, and to have been drilled in or before 1981, the priority date of the G-80 application, the water column and the predicted 40-year incremental drawdown due to full exercise under G-80 are shown. Wells drilled during or after 1982, exploratory wells, observation or monitoring wells for which no diversion amount is shown, wells drilled for mineral prospecting for which no diversion is shown, pollution-control wells for which no diversion is shown, wells belonging to the City of Gallup, and temporary construction-dewatering wells, are not shown in the table. Some entries in the database represent expired permits, permits for which no well record was filed, or cancelled permits; these are not included in the table.

Several wells roughly 20 miles southwest of Gallup may be completed in beds that are stratigraphically equivalent to the Westwater Canyon Member, but assigned to the upper part of the Zuni Sandstone. The deepest wells in the Vanderwagon area, in the southwestern quarter of T. 12 N., R. 18 W., may reach the Zuni beds. Although no logs were found to allow the aquifer to be identified with certainty, the wells more than 500 ft deep are included in Table 4. Shallower wells are probably completed in beds assigned to the Gallup Sandstone.

Table 4. Wells within the area of interest that were drilled in or before 1981, and produce from the Dakota Sandstone, the Westwater Canyon Member, or both, and calculated drawdown effect due to pumping up to 2,600 ac-ft/yr under the schedule described in text from proposed wells under File No. G-80.

OSE Well No.		Twp.	Rng.	Sec.	Q 160	Q 40	Q 10	Completion date	Depth, ft	Depth to water, ft	Dakota-Westwater well?	Casing diameter, in.	UTM location (Zone 13), NAD 83 datum		Use of water	Total diversion, ac-ft/yr	Owner as shown in OSE records	Water column, ft	40-year drawdown due to G-80, ft	Remarks
													Easting, m	Northing, m						
G- 1523		12N	18W	20	2	4	3	1977-04-16	590	110	?	6.63	158338	3908084	MDW	15.50	KIWANIS FOUNDATION	480	10	
G- 1961		12N	18W	29	1	4	1	1939-12-31	720	0	?	6.00	157465	3906697	COM	30.00	WINFIELD	–	9	
G- 1797		12N	18W	29	1	4	3	1974-12-31	600	0	?	8.00	157465	3906497	PMH	3.00	SLOAN	–	9	
G- 31	POD1	12N	18W	29	2	1	3	*1980*	520	471	?	5.56	157839	3906852	DOM	3.00	CHARLES	49	10	
G- 1768		12N	18W	29	2	2	3	1975-12-31	800	0	?	4.00	158288	3906863	PDL	3.00	VANDERWAGON	–	10	
G- 1567	POD1	12N	18W	32	1	2	2	1962-12-31	650	0	?	6.00	157622	3905471	PDL	10.00	KAMINSKI	–	9	
G- 2168		12N	19W	10	2	4		1970-06-06	640	400	?	7.00	152101	3911624	STK	10.00	SULLENGER	240	13	
G- 1800		12N	19W	26	1	1	3	1957-12-31	732	0	?	4.00	152231	3907084	DOM	3.00	DAVIS	–	10	
G- 1785		12N	20W	8	4	3	4	1959-12-31	500	0	?	8.00	138828	3911184	PDL	10.00	BAPTIST MID-MISSIONS	–	no-flow cell	
G- 82		14N	20W	31	3	3	2		0	0	X	0.00	136197	3924428	HWY	24.00	HIGHWAY DEPARTMENT	–	0	
G- 57	POD1	14N	21W	36	3	3	2	1981-04-21	260	80	X	4.00	134577	3924579	DOM	3.00	THOMSON	180	0	
G- 57		14N	21W	36	3			1981-04-21	260	80	X	0.00	134715	3924624	DOM	3.00	THOMSON	180	0	
G- 12	S	16N	16W	2	1	1	2		1,600	1,330	X	8.00	182371	3951091	IND	0.00	UNITED NUCLEAR CORPORATION	270	17	
G- 190		16N	16W	17	2	1	4	1959-08-31	862	0		0.00	178184	3947803	MIN	1,048.00	UNITED NUCLEAR CORPORATION	–	12	Old Church Rock Mine
G- 1100	S2	16N	16W	30	1	1	2	1968-12-31	500	0	X	10.00	175721	3944871	COM	51.00	AUBREY	–	2	
G- 1100	S	16N	16W	30	1	3	1	1968-12-31	500	0	X	10.00	175506	3944469	COM	51.00	AUBREY	–	2	
G- 1100		16N	16W	30	3	4	3	1930-12-31	550	450	X	7.50	175803	3943449	COM	51.00	AUBREY	100	0	
G- 13		16N	18W	7	4	4	1	1966-04-30	3,158	0	X	5.50	157776	3949165	MDW	364.37	ALLIFER INC	–	1,343	Gallup supplies water.
G- 9		16N	18W	32	4	2	4	1922-03-03	2,882	0	X	8.00	159133	3942873	MUN	289.93	GAMERCO WATER/SANITATION DIST	–	682	Not used.
G- 11		17N	16W	35	4	1	1	1969-07-16	1,788	799	X	0.00	182358	3951798	IND	1,140.44	UNITED NUCLEAR CORPORATION	989	18	
G- 12		17N	16W	35	4	1	3	1967-12-04	1,650	550	X	5.50	182358	3951598	IND	0.00	UNITED NUCLEAR CORPORATION	1,100	18	

A completion date is shown in the OSE database for only some of the wells; where no completion date is given, but there is an application, the year of the application was found, and the well, if drilled, was assumed to have that priority date.

The area represented by the information in Table 4 includes townships T. 12 N. through T. 17 N., R. 16 W. through R. 21 W. The effects of the proposed pumping would propagate much

farther to the north than T. 17 N., but all of that area in which the effects would be significant is within the Navajo Reservation. The wells on the Navajo Reservation, and wells belonging to the U.S. Bureau of Indian Affairs, were not considered in this report because both the Navajo Nation and the Bureau of Indian Affairs have waived any claim of impairment to existing wells or water rights as a result of the granting of the application.[1]

The entire dataset of WATERS records for townships T. 12 N. through T. 17 N., R. 16 W. through R. 21 W., from which Table 4 was derived, and showing the information that is relevant to this report for each well, is given in the Appendix. Information fields were deleted from the dataset where redundant or irrelevant, or if the data were available for only a few wells.

Figure 1 and Table 4 show the model-calculated 40-year drawdown effect in the Dakota-Westwater sequence of pumping up to 2,600 ac-ft/yr from the proposed G-80 wells following the pumping schedule described above. The effects on individual wells are discussed in the following paragraphs, and compared with the OSE "Morrison" guidelines (Morrison, 2017, p. 9) as applicable.

The OSE Morrison guidelines (at p. 9) include the following statement: "The presence of a reasonably completed critical well in which the drawdown allowance is exceeded may be considered grounds for impairment. However, before this finding can be rendered, additional factors should be considered such as whether the affected well can be deepened or replaced, and well age." The guidelines make the further point, referring to wells 40 years or less in age, that "…agency basin guidelines attempt to preserve water for 40 years for these wells." Any well that existed at the time of filing of the G-80 application in October of 1981 is now more than 38 years old.

With the exception of Wells G-9 and G-13, wells of other ownership are so far from the proposed G-80 wells that the distribution of pumping among the G-80 wells would have negligible effect on the calculated drawdowns in wells of other ownership. The effects of pumping under a G-80 permit in the wells or groups of wells that existed prior to the G-80 application as shown in Table 4, including Wells G-9 and G-13, for which significant drawdown is predicted, are discussed in the following paragraphs.

[1] See letter dated August 2, 2019 from Daniel G. Moquin, Navajo Nation Department of Justice, to Wayne Canon, District Manager, OSE District 1; and letter dated April 29, 2020 from Bartholomew Stephens, U.S. Department of the Interior, Bureau of Indian Affairs, to Wayne Canon, District Manager, OSE District 1.

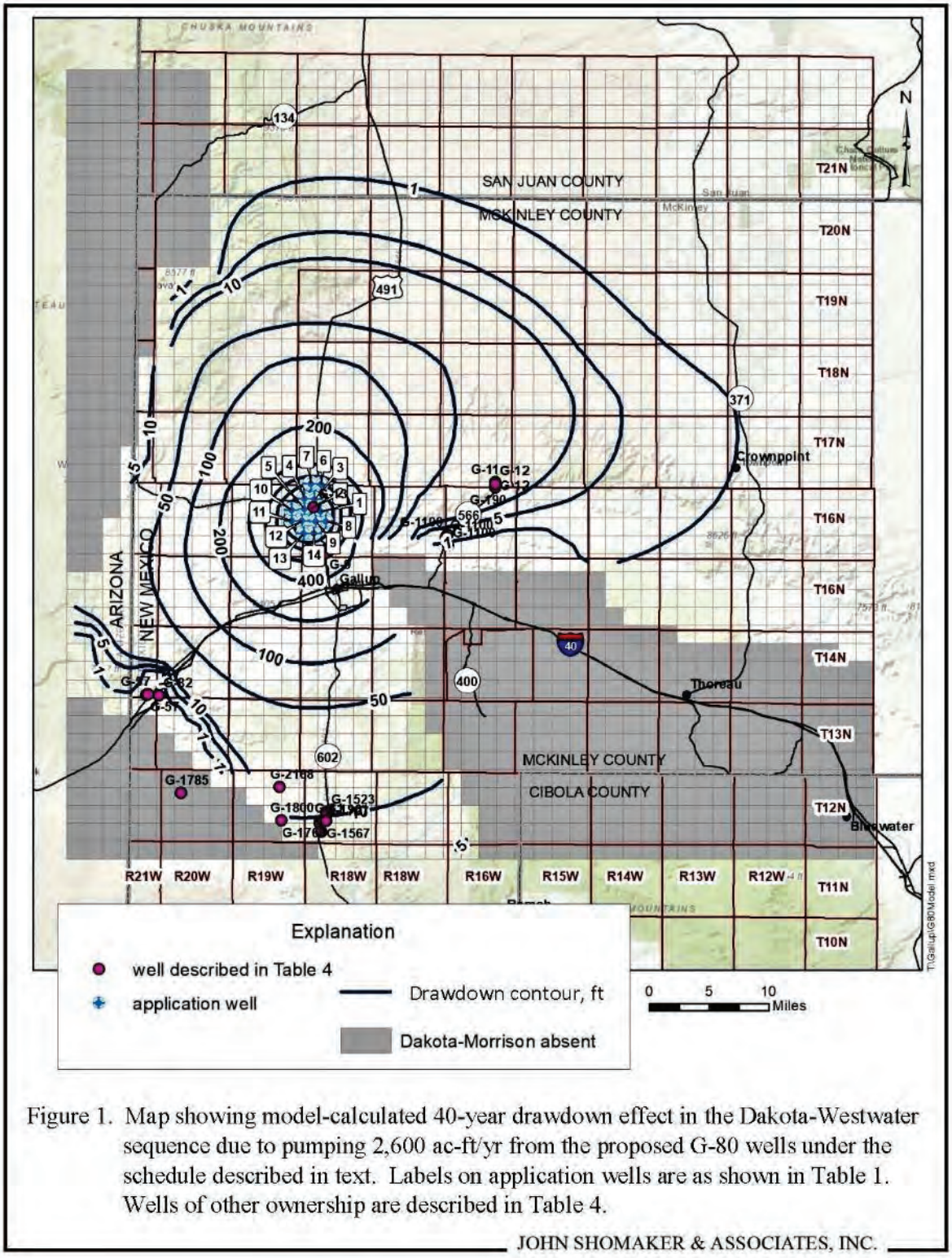


Figure 1. Map showing model-calculated 40-year drawdown effect in the Dakota-Westwater sequence due to pumping 2,600 ac-ft/yr from the proposed G-80 wells under the schedule described in text. Labels on application wells are as shown in Table 1. Wells of other ownership are described in Table 4.

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Wells near Vanderwagen: Nine wells in T. 12 N., R. 18-20 W., near Vanderwagen, may be competed in beds equivalent to the Westwater Canyon, as discussed above. The incremental 40-year drawdown related to pumping under a G-80 permit ranges from 9 to 13 ft. The wells are spudded above the Gallup "E" sandstone, and thus there is approximately 1,600 ft of stratigraphic section above the base of the Zuni Sandstone (see, e.g., Anderson, 1990), much of which consists of sandstone beds capable of providing satisfactory yields to wells for domestic and small commercial purposes, so that all of these wells can be deepened to restore lost capacity. These wells, all of which are 40 years old or older, are discussed in the following six paragraphs.

Well G-1523, Kiwanis Foundation: The total depth of the well, drilled in 1977, is 590 ft. The specific capacity can be estimated from the information in the declaration as 0.029 gpm per foot of drawdown at 10 gpm, with a pumping water level of 460 ft. The declared diversion is 15.5 ac-ft/yr, equivalent to 9.6 gpm constant. The water column in the well in 1977 was 480 ft, so that at any pumping rate a few gallons per minute greater than the annual average, the entire column would have been emptied. The well would have been self-impaired and probably unable to produce the declared amount 43 years ago. The predicted 40-year incremental drawdown due to pumping under a Permit No. G-80 is 10 ft, about 2 percent of the 1977 column. The Morrison guidelines would seem not to apply because of the self-impairment issue.

Well G-1961, Winfield: The total depth of the well, drilled in 1939, is 720 ft. The Point of Diversion Summary provides no water-level, but the capacity is shown as 60 gpm. The declared diversion is 30.0 ac-ft/yr. Given the relatively high capacity, it is unlikely that the incremental 40-year effect of pumping under Permit No. G-80, at 9 ft, would exceed the Morrison guidelines, and the well can be deepened to restore lost capacity as discussed above.

Wells G-1797, G-31, G-1768, and G-1800, various owners: These are Sec. 72-12-1 wells with diversions limited to 3.0 ac-ft/yr, and are 600 to 800 ft deep. For these wells the Morrison guidelines would require that a minimum water column of 20 ft remain at the end of 40 years (Morrison, 2017, p. 8). The 40-year incremental drawdown due to pumping under Permit No. G-80 is 9 to 10 ft. All are 40 or more years old, and all can be deepened to or through the Zuni Sandstone to restore lost capacity.

Well G-1567, Kaminsky: The well was drilled in 1962, and is 650 ft deep. The declared diversion is 10 ac-ft/yr; there is no water-level information in the OSE database, but a newer nearby well, G-1775, had a depth to water of 420 ft. If the depth to water is similar to that in Well G-1775, the water column would be 230 ft. The 40-year incremental drawdown due to pumping under G-80 is 9 ft, or about 4 percent of the column. The well can be deepened to the base of the Zuni Sandstone as described above. The Morrison guidelines would require, at a minimum, that the drawdown effect be no greater than 70 percent of the column.

Well G-2168, Sullenger: This well was drilled in 1970, has a declared diversion of 10.0 ac-ft/yr. The water column was 240 ft; the 40-year incremental drawdown due to G-80 is 13 ft, or about 5 percent of the column. The well can be deepened to the base of the Zuni Sandstone as described above. The Morrison guidelines would require, at a minimum, that the drawdown effect be no greater than 70 percent of the column.

Well G-1785, Baptist Mid-Missions: This well is just beyond the area represented by the model, and produces from the Zuni Sandstone. No depth to water or yield were found to support an analysis following the Morrison guidelines; the well was drilled in 1959, and has a declared diversion of 10 ac-ft/yr. The incremental drawdown attributable to pumping

under a G-80 permit is estimated to be less than 1 ft. The effect of pumping under G-80 would not exceed the Morrison guidelines.

Well G-82, New Mexico State Highway Department: There is no information about the well construction or yield in the NMWRRS database. It was drilled in 1968, and is likely to produce from the Zuni Sandstone; the estimated incremental drawdown due to pumping under G-80 is less than 1 ft. The effect of pumping under G-80 would not exceed the Morrison guidelines.

Wells G-57 and G-57 POD1, Thompson: The OSE database includes two entries for these wells, with the same depth and drilling date but different locations. The two entries may describe the same well. In any case, the model-calculated 40-year drawdown due to pumping under G-80 is less than 1 ft. The effect of pumping under G-80 would not exceed the Morrison guidelines.

Wells G-11, G-12, G-12-S and G-190, United Nuclear Corp.: These points of diversion, one of which is the mine shaft itself (Well G-190), belonged to the United Nuclear Church Rock Mine. The Westwater Canyon Member of the Morrison was the geologic unit that contained the uranium ore. The model-calculated drawdown due to pumping under G-80 is in the range 12 to 18 ft. The 270-ft water column in Well G-12-S, in 1967, may represent the depressed potentiometric surface attributable to dewatering of that mine, or the nearby Kerr-McGee Church Rock Mine on the Navajo Reservation. The water column indicated for the shaft itself and for Well G-11, which may have been a mine-dewatering well, are much greater as shown in Table 4. The United Nuclear mine was decommissioned in 1982, and there is no indication in State Engineer online records that the rights have been exercised in recent years. Pumping from shallower aquifers is continuing as part of a Superfund cleanup, but there seems to be no other activity at the site, and no pumping from the Dakota-Morrison sequence has been posted to the State Engineer website.[2] If there has been little or no pumping from the Dakota-Morrison sequence in many years, the water column in each of these wells is likely to be much greater than the 270 ft reported for Well G-12-S, and the reduction due to the effect of pumping under G-80 would be a small percentage of the column, much less than the 70 percent contemplated in the Morrison guidelines.

Wells G-1100 et al., Aubrey: The 40-year incremental drawdown due to pumping under G-80 is estimated at up to 2 ft. The Morrison guidelines (Morrison, 2017, p. 4) indicate that for an aquifer 200 ft or more in thickness, as would be the case for the Dakota-Morrison sequence there, the 40-year drawdown allowance would be 4.0 ft. The effect of pumping under G-80 would not exceed the Morrison guidelines.

Well G-13, Allifer Inc.: Three wells are shown under File No. G-13. One of these, Well G-13, drilled in 1966, is completed in the Dakota-Westwater aquifer and is shown on Figure 1 and in Table 4. The other two are completed in the Gallup Sandstone. No depth to water is given in the OSE records, but the water-level elevation is presumably similar to that in the City of Gallup's nearby Lewis well, G-97-S-8, or about 5,885 ft (in 2012). If that is the case, then the depth to water would be about 710 ft, and the water column, assuming that the top of the Dakota-Westwater sequence is at about the same elevation as in the Lewis well, or 3,853 ft, would be about 2,032 ft. The predicted 40-year drawdown of 1,343 ft attributable to pumping under G-80 would represent about 66 percent of the column, which might exceed the Morrison guidelines if drawdown during pumping from Well G-13 itself were accounted for.

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[2] See https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0600819#Status.

The specific capacity of the well is not known, and for that reason, the drawdown during pumping is not known. Although meter readings are reported for one of the Gallup Sandstone wells under File No. G-13 (Well G-13-S-2), no meter readings are shown for the other Gallup Sandstone well (G-13-S), or for Well G-13 itself, and it may be that Well G-13 is out of service. The G-13 declaration does not indicate any allocation of production as between the Gallup Sandstone and the Dakota-Westwater aquifer, so that any loss of capacity of Well G-13 could be compensated for by increased pumping from one of the other two wells, or if required, by drilling a supplemental third Gallup Sandstone well. In any case, the City of Gallup has furnished water to Allifer and its predecessors under an agreement executed in 1977.[3] It would appear that the question of impairment relating to Well G-13 is moot.

Well G-9, Gamerco Water and Sanitation District: Well G-9 is reported to be out of service and probably unusable. Information from DePauli Engineering and Surveying, LLC, (June 23, 2020) is as follows: "The Gamerco well (G-9) is in place on private property not owned by the Gamerco Water and Sanitation District. The well casing has collapsed and offset and the pump and column may be stuck in the well…," and, "…a new replacement well was not constructed for the District as planned because of costs. Instead, the City of Gallup supplies water to the residents of Gamerco Townsite." It would appear that the question of impairment relating to Well G-9 is moot.

Summary: Of the 21 wells listed in Table 4, 13 wells are not in service, or water is supplied by Gallup, or the drawdowns attributable to pumping under a G-80 permit would not exceed the Morrison guidelines. The other eight wells, with incremental drawdowns attributable to pumping under G-80 ranging from 9 to 13 ft, are more than 40 years old, and can be deepened, and in one case the information in the State Engineer record shows that the well would self-impair.

4. Simulate, where applicable, impacts of pumping the fully exercised 2,600 afa on any surface water.

The area represented by the modified G-80 groundwater model does not include the reach of any stream that might be in connection with the Westwater Canyon and associated aquifers. However, an OSE groundwater flow model prepared by Keyes (2018) represents a sequence of aquifers that includes the Dakota Sandstone, the Westwater Canyon Member, and the underlying Entrada Sandstone, and covers the entire San Juan Basin in New Mexico, including the Gallup sub-basin. The Keyes model explicitly addresses the connections with the San Juan River in the northwestern part of the San Juan Basin, and the Rio Gallina at the eastern edge of the basin. Keyes identified only those two streams as being in connection with the Dakota-Westwater-Entrada sequence of aquifers in the basin. The model does not represent the variation in aquifer properties in enough detail within the Gallup sub-basin to be used in evaluating well-by-well drawdowns, but it has been accepted by OSE on a basin-wide scale for evaluation of stream depletion due to pumping from the sequence of aquifers.[4]

The Keyes model was operated to estimate the depletion of the San Juan River and the Rio Gallina due to pumping of 2,600 ac-ft/yr from a pumping center at Yah-Ta-Hey, central to the G-80 well field, for 100 years. It should be noted that this analysis does not reflect the pumping

[3] See *Agreement to Furnish Water to Yah-Ta-Hey*, between City of Gallup and J.B. Tanner, October 13, 1977.
[4] See State Engineer File Nos. SJ-4301 et al., Enduring Resources.

schedule for G-80 wells discussed above, but represents pumping of the full 2,600 ac-ft/yr each year for 40 years. The depletion rate for the San Juan reaches a maximum of about 0.02 ac-ft/yr, at the end of 100 years of pumping, as shown by Figure 2. The calculated depletion rate for the Rio Gallina was less than 0.0005 ac-ft/yr at the end of 100 years of pumping. It is expected that these rates of depletion will be considered *de minimis*.

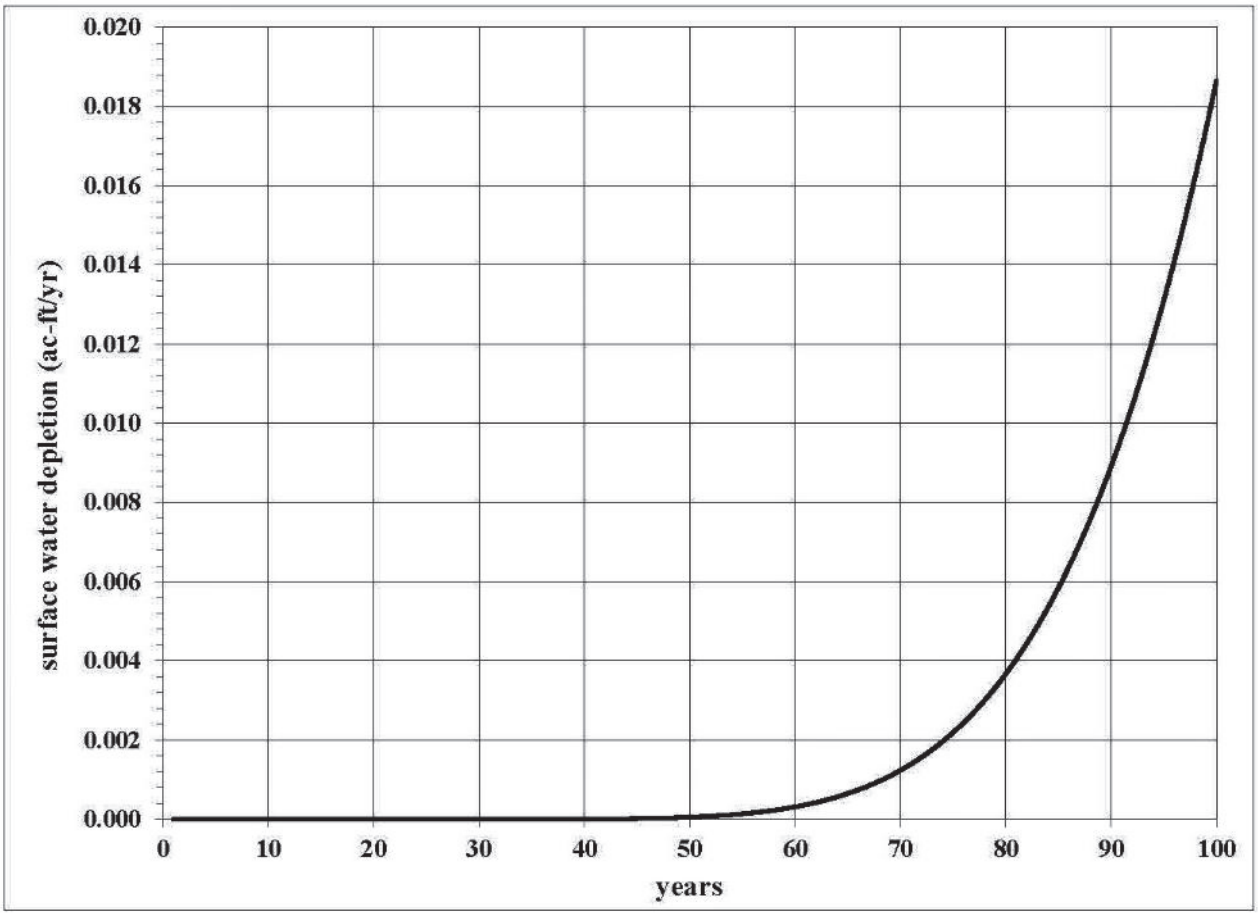

Figure 2. Graph showing rate of depletion of San Juan River flows due to pumping 2,600 ac-ft/yr from proposed wells, File Nos. G-80 and SJ-1491, as calculated by the OSE (Keyes, 2018) groundwater model.

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Areas Affected by Project

Gallup Ground Water Well, Professional Services, Design & Construction areas affected will be the City of Gallup in McKinley County, New Mexico to be a Navajo Gallup Water Supply Project hub for rural unincorporated areas and Chapter communities of the Navajo Nation.

To supplement the NGWSP project being delayed at least 5 year, which involves installation of approximately 300 miles of pipeline to transport water from the San Juan River to the Navajo Nation, Jicarilla Apache Nation, and the City of Gallup in Sandoval and McKinley counties, New Mexico and in portions of the Navajo Nation in Apache County, Arizona.