



**CITY OF SONORA**  
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## WATER DISTRIBUTION SYSTEM IMPROVEMENT PLAN

03/18/2025

To Whom It May Concern:

The City of Sonora has been actively addressing critical deficiencies in its water distribution system and infrastructure over the past year. This project is vital to improving essential city operations, safeguarding water resources, and ensuring financial sustainability for our community.

### Water Infrastructure Challenges:

Sonora's water distribution system has been experiencing up to 55% water loss due to factors such as waterline fractures, outdated meter readings, and possible unauthorized use of water services. A comprehensive study of the city's water infrastructure has confirmed the significant impact of this water loss, which not only strains city resources but also affects taxpayers by reducing the potential for revenue generation and financial stability.

To address these challenges, the City Council has prioritized the following actions:

- Identifying and repairing water leaks and damaged lines.
- Upgrading water well locations and equipment for safer and efficient water production.
- Replacing outdated water meters across the city.
- Installing a fixed-base Advanced Metering Infrastructure (AMI) system to enable real-time monitoring of water usage and ensure more efficient management of water services.

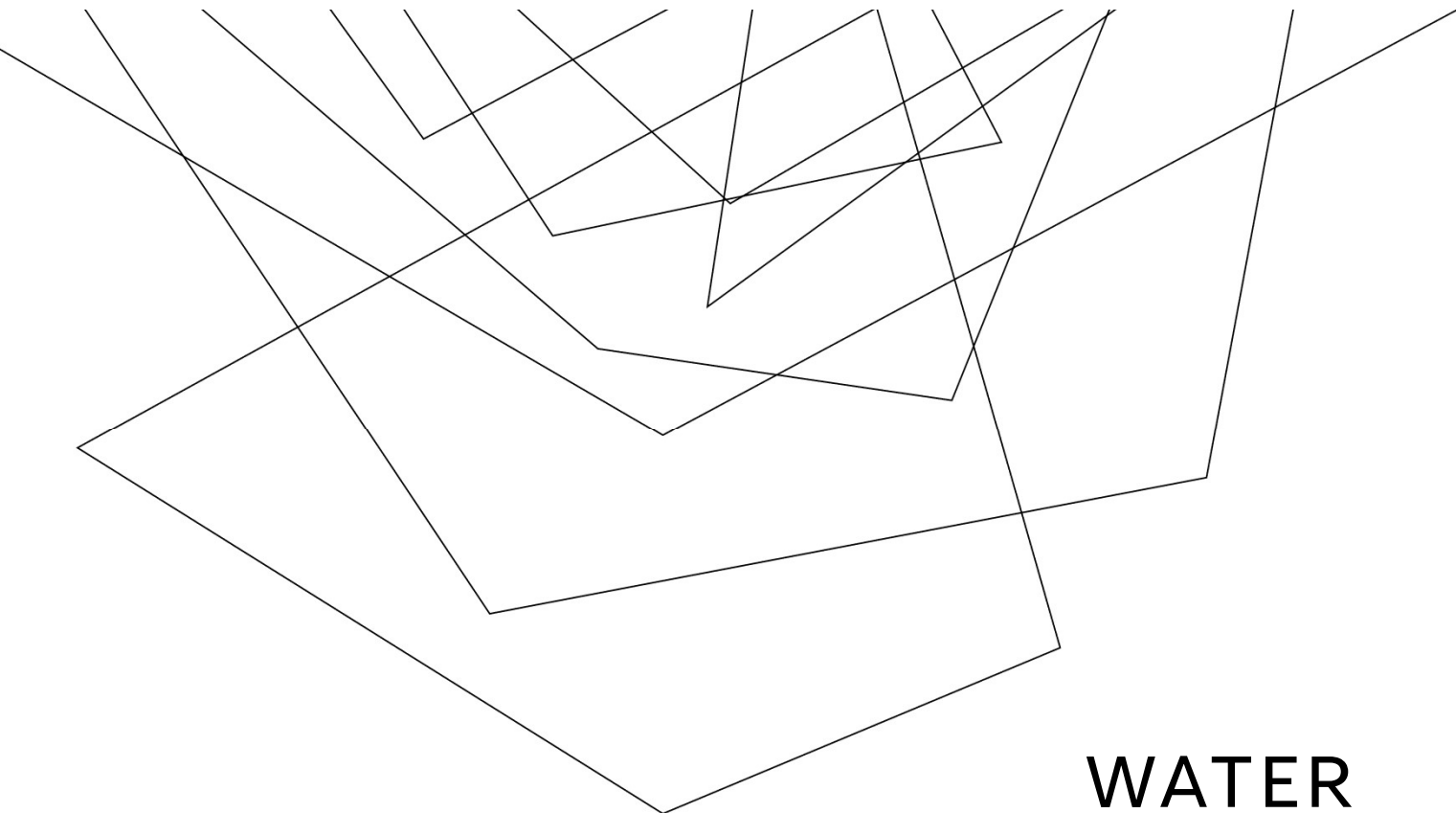
This comprehensive water improvement project is estimated to cost approximately \$3.5 million. The City Council is fully committed to these initiatives, recognizing their importance for environmental protection, operational efficiency, and long-term financial stability.

Feel free to contact Arturo Fuentes at (325) 387-2558 for further information.

Sincerely,

Arturo Fuentes, City Manager

**ATTACHMENTS:** Photo Tour  
Scope of Work  
Financial Benefits Report



**WATER  
INFRASTRUCTURE**

WELLS 1, 2 AND 3



WELL # 4





**Well # 4**



WELL # 4

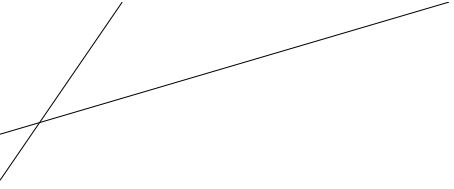


WELL # 4

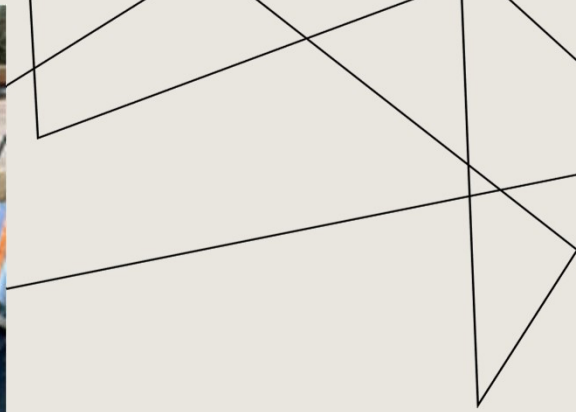


**WELL # 4**





WELL # 4



WELL # 4

WELL # 5





# ELECTRICAL PANELS





# THANK YOU

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# City of Sonora

## WATER DISTRIBUTION SYSTEM SCOPE OF WORK

### Wells at City Hill, County Yard, and Cemetery

- Well #1, #2, and #3
  - Replace all meters (6" Neptune)
  - Enclose electrical breakers with a metal building.
    - We will leave the generator outside of the metal building with a convenience plug on the outside wall for the generator (Double gang 120v).
  - Demo the existing piping leading from pumps to chlorination building and install new piping.
    - Demo all existing above ground piping and existing concrete supports.
    - Install one (1) 12" header with four (4) 6" lines connections at existing 90-degree fitting coming out of ground. One (1) 6" connection will be for future use the other three (3) 6" connections are to be for the three (3) existing pump connections.
    - Install new concrete piping supports for three (3) 6" lines feeding the 12" header.
    - Install three (3) new 6" lines to go from pump #1, #2, and #3 to the 12" header.
    - \$15,000 allowance to replace all seals on pump #1, #2, and #3.
    - Insulate all new piping installed for the pumps currently in place.
    - Piping to be installed next to existing lines and completed prior to tie in to minimize time pumps are down.
    - Testing & start-up.
    - Excludes disinfection.
  - Haul off
- Well #4
  - Demo existing metal structure and enclose with new metal building.
    - Will demolish existing concrete foundation and pour new concrete foundation. (10' x 25')
    - Will install new mini split, condenser, and condenser pad
    - Will install electrical for lighting and HVAC equipment. Electrical will not be for the pump itself.
  - Correct drainage around the well.
    - Grade out the swell and direct the water to the new 12" culvert being installed to cross the road and enter the existing drainage ditch.

- Cut and restore gravel and asphalt after installation of the drainage pipe and culverts.
  - Install new galvanized aluminum fence. (400 LF)
    - Will include new gates (1) 12' gate & (1) double 20' gate
  - Demolish existing piping starting at the 90-degree fitting coming out of ground and install new above ground piping.
    - Includes test pipe, check valves, pressure valves, pipe supports, and meters.
    - Will demolish all valve basins and bring all valves and piping up to grade.
    - Will redo chlorine feed line and bury it underground.
  - Demo and Install new Chloring Building
    - Install new exhaust fan inside existing building.
  - Electrical Upgrades
    - Upgrade electrical panel to 225 with NEMA 4. And reconnect existing electrical. Will have an Electrician check all existing electrical lines and install new 200 LF of electrical conduit.
    - Relocate new electrical panels. Install 4 new steel posts to mount new panels. Leave existing posts in place.
  - Haul off
- Well #5
  - Installation of new piping
    - Replace existing meter (6" Neptune)
    - Demolish existing 4" dead line.
    - Demolish existing piping and reinstall starting at new check valve currently installed. The line will connect to the 45-degree fitting on the exterior of building.
    - Install two new doors and locks to the existing building and refinish the interior. New insulation, drywall, tape and float (no texture), and paint interior and exterior.
    - Reset existing electrical outlets and fixtures.
    - Install new metal roof panels
    - Complete grubbing around the exterior of the existing building.
    - Haul off

## City Meter Replacement

This measure involves replacing the current residential and commercial meters and installing the Diehl AMI system to facilitate communication with all meters. The benefits include:

- Water Meters:
  - High-accuracy flow measurements across extended-low, low, medium, and high flow rates
  - No moving parts in both residential and commercial flow meters
  - Reduced maintenance and operational costs for the water system
  - Enhanced revenue from residential water meters, ensuring 20 years of accuracy
  - Meter alerts, including notifications for leaks
  - 20% new meter boxes and lids
- AMI:
  - Lowered operations and maintenance costs
  - Real-time access to customer billing data
  - Enhanced customer service
- Billing Integration:
  - Improved accuracy in billing, customer experience, and processing timeline
  - A billing platform designed for future integrations
  - Reduction in customer billing complaints

This measure entails the replacement of the following quantities and sizes of water meters:

- The accounts/meters excluded from the scope are:
  - Any meters not identified by the City of Sonora
- The scope includes the provision of the following spare water meters:
  - None

### Detailed Scope:

- (1,376) 5/8" x 3/4" Neptune meters
- (173) 1" Neptune meters
- (74) 1.5" Neptune meters
- (36) 2" Neptune meters
- (8) 3" Neptune meters
- (1,667) Neptune Cellular Endpoints
- (420) Meter Assemblies
- (420) Residential Meter Boxes



- Neptune Meter Data Management software
- 12 months of hosting for the MDM software
- Training for Diehl Meter Data Management software
- Leak Detection System
- Vac-Truck

### Solid-State Water Meters

Ultrasonic meters employ solid-state technology within a compact, fully encapsulated, weatherproof, and UV-resistant housing, making them suitable for both residential and commercial applications. This electronic metering technology provides information such as flow rate and leak detection indications, along with data that is not typically accessible through traditional mechanical meters and registers. Additionally, electronic metering eliminates measurement errors caused by sand, suspended particles, and fluctuations in pressure.

Solid state technology meter features:

- Extended low-flow rates compared to typical positive displacement meters, allowing registration of very low water flows.
- A simplified, one-piece electronic meter and register that are integral to the meter body and virtually maintenance-free.
- A sealed, non-removable meter and register designed to be tamper-proof.
- 20-year accuracy warranty for meters ranging from 5/8" to 1".
- 10-year accuracy warranty for meters of 1.5" and larger.

All meters will utilize solid-state water meter technology. These meters comply with or surpass the latest revisions of AWWA Standard C701 and C702 Class II. Furthermore, the meters do not require a valve to meet these standards. Each meter undergoes performance testing to ensure compliance. All meters are approved to the latest NSF/ANSI Standard 61, Annex F and G standards.

Solid-state technology meters adhere to the relevant sections of the 2015 revision of ANSI/AWWA Standard C-700 and C-710 concerning accuracy and pressure loss requirements. Additionally, the meters are compliant with ANSI/AWWA C715 standards and NSF/ANSI Standard 61, Annex F and G, and have been tested according to AWWA standards.

The solid-state technology meter includes an in-line connector for straightforward connection and installation of AMR/AMI endpoints.

### AMI - Advanced Metering Infrastructure

This project will put all meters onto the Diehl IZAR AMI system.

Advanced metering systems consist of cutting-edge electronic and digital hardware and software that integrate interval data measurement with continuously accessible remote communications. These systems facilitate the measurement of detailed, time-based information and enable frequent collection and transmission of this data to various stakeholders. Advanced Metering Infrastructure (AMI) typically refers to the comprehensive measurement and collection system, which includes meters located at the customer site, existing cellular communication networks linking the customer with the service provider—such as the City of Sonora—and data reception and management systems that make this information accessible to the service provider.

AMI links smart water meters to advanced analytics, equipping the City of Sonora with all the necessary tools to enhance its utility management. Moreover, customer portals will enable water customers to monitor and manage their own water usage effectively.

- Cellular technology
- Capability for future expansion of the Cellular network and the IZAR Meter Data Management (MDM) system
- Connection to the City's Fiber Network, enhancing control over connected network systems and enabling quicker recovery during severe weather events
- Web-based software
- Custom integrations
- Device and meter readings
- Consumption profiles
- Visibility across multiple sites
- Support for multiple users
- Dashboard to display system status
- Integrated mapping features
- Immediate access to data regarding the water utility system
- Facilitates proactive customer engagement
- Reduces resources needed for billing and handling customer service inquiries
- AMI integration with the existing billing system
- Enhanced customer service through near real-time data
- Improved operational efficiencies
- The City of Sonora will be able to gather the information required to generate water billing statements with minimal visits to customer properties
- Customers will have the ability to track and monitor their water usage

- Information will be consolidated for billing, outage management, and water theft prevention
- Monthly water billing data will be significantly improved with more detailed information
- If a customer moves, the City of Sonora can quickly read customer meters to provide a detailed bill reflecting usage as of the move date
- Address customer billing complaints using near real-time data
- The City of Sonora will be equipped to offer more information about outages and interruptions, thereby minimizing customer complaints and communication challenges

**TOTAL COST: \$3,661,933.00**

# Sonora

Annual Water/Sewer Rev. = \$1,975,000	O&M Savings (\$) = \$58,123	Distribution Savings (\$) = \$75,000	Available Project Funding (\$) = \$4,916,397
Recovered Accuracy (%) = 8.1%	O&M Savings Term (Yrs) = 20	Distribution Leaks (%) = 10.0%	Finance Term (Yrs) = 20
Billable Usage Increase (\$) = \$146,000	Capital Cost Avoidance (\$) = \$26,000	Distribution Emer. Repairs (\$) = \$0	Interest Rate (%) = 5.07%
Inflation = 3.0%	CCA Term (Yrs) = 20	Additional Water Sales (\$) = \$74,000	Annual M&V Cost (\$) = \$1,800
Construction Period (M) = 12	Annual Maint Cost (\$) = \$0	Other (\$) = \$55,000	Annual MDM System Cost (\$) = \$25,000

## One-time Transactions

Capital Infusion (\$) = \$0	Rebates (\$) = \$0	Financing Charge (\$) = \$0	Technical Services (\$) = \$0
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Traditional

Year	Financial Benefits						Project Costs					Positive Cash-Flow		
	Additional Water Revenue	Energy Savings	Water Department O&M Savings	Distrib. Savings	Capital Cost Avoidance	Total Benefit	P&I	Payment	M&V Service	Annual Maint. Cost	MDM System	Total Cost	Annual Difference	Cumulative Difference
<b>Const.</b>	\$58,400	\$29,600	\$45,249	\$30,000	\$0	\$163,249	\$0	\$0	\$0	\$0	\$0	\$0	\$163,249	\$163,249
1	\$146,000	\$74,000	\$113,123	\$75,000	\$26,000	\$434,123	\$396,849	\$0	\$0	\$25,000	\$421,849	\$12,274	\$175,523	
2	\$150,380	\$76,220	\$116,517	\$77,250	\$26,000	\$446,367	\$396,849	\$1,800	\$0	\$25,750	\$424,399	\$21,967	\$197,490	
3	\$154,891	\$78,507	\$120,012	\$79,568	\$26,000	\$458,978	\$396,849	\$1,800	\$0	\$26,523	\$425,172	\$33,806	\$231,296	
4	\$159,538	\$80,862	\$123,613	\$81,955	\$26,000	\$471,967	\$396,849	\$1,800	\$0	\$27,318	\$425,967	\$46,000	\$277,296	
5	\$164,324	\$83,288	\$127,321	\$84,413	\$26,000	\$485,346	\$396,849	\$1,800	\$0	\$28,138	\$426,787	\$58,559	\$335,855	
6	\$169,254	\$85,786	\$131,141	\$86,946	\$26,000	\$499,126	\$396,849	\$1,800	\$0	\$28,982	\$427,631	\$71,495	\$407,350	
7	\$174,332	\$88,360	\$135,075	\$89,554	\$26,000	\$513,320	\$396,849	\$1,800	\$0	\$29,851	\$428,501	\$84,820	\$492,170	
8	\$179,562	\$91,011	\$139,127	\$92,241	\$26,000	\$527,940	\$396,849	\$1,800	\$0	\$30,747	\$429,396	\$98,544	\$590,713	
9	\$184,948	\$93,741	\$143,301	\$95,008	\$26,000	\$542,998	\$396,849	\$1,800	\$0	\$31,669	\$430,319	\$112,679	\$703,393	
10	\$190,497	\$96,553	\$147,600	\$97,858	\$26,000	\$558,508	\$396,849	\$1,800	\$0	\$32,619	\$431,269	\$127,239	\$830,632	
11	\$196,212	\$99,450	\$152,028	\$100,794	\$26,000	\$574,483	\$396,849	\$1,800	\$0	\$33,598	\$432,247	\$142,236	\$972,868	
12	\$202,098	\$102,433	\$156,589	\$103,818	\$26,000	\$590,938	\$396,849	\$1,800	\$0	\$34,606	\$433,255	\$157,683	\$1,130,550	
13	\$208,161	\$105,506	\$161,286	\$106,932	\$26,000	\$607,886	\$396,849	\$1,800	\$0	\$35,644	\$434,293	\$173,592	\$1,304,143	
14	\$214,406	\$108,671	\$166,125	\$110,140	\$26,000	\$625,342	\$396,849	\$1,800	\$0	\$36,713	\$435,363	\$189,980	\$1,494,123	
15	\$220,838	\$111,932	\$171,109	\$113,444	\$26,000	\$643,323	\$396,849	\$1,800	\$0	\$37,815	\$436,464	\$206,859	\$1,700,981	
16	\$227,463	\$115,290	\$176,242	\$116,848	\$26,000	\$661,842	\$396,849	\$1,800	\$0	\$38,949	\$437,598	\$224,244	\$1,925,225	
17	\$234,287	\$118,748	\$181,529	\$120,353	\$26,000	\$680,918	\$396,849	\$1,800	\$0	\$40,118	\$438,767	\$242,151	\$2,167,376	
18	\$241,316	\$122,311	\$186,975	\$123,964	\$26,000	\$700,565	\$396,849	\$1,800	\$0	\$41,321	\$439,971	\$260,595	\$2,427,970	
19	\$248,555	\$125,980	\$192,584	\$127,682	\$26,000	\$720,802	\$396,849	\$1,800	\$0	\$42,561	\$441,210	\$279,592	\$2,707,562	
20	\$256,012	\$129,759	\$198,362	\$131,513	\$26,000	\$741,646	\$396,849	\$1,800	\$0	\$43,838	\$442,487	\$299,159	\$3,006,721	
<b>Total</b>	<b>\$3,981,475</b>	<b>\$2,018,008</b>	<b>\$3,084,907</b>	<b>\$2,045,278</b>	<b>\$520,000</b>	<b>\$11,649,667</b>	<b>\$7,936,986</b>	<b>\$34,200</b>	<b>\$0</b>	<b>\$671,759</b>	<b>\$8,642,946</b>	<b>\$3,006,721</b>		