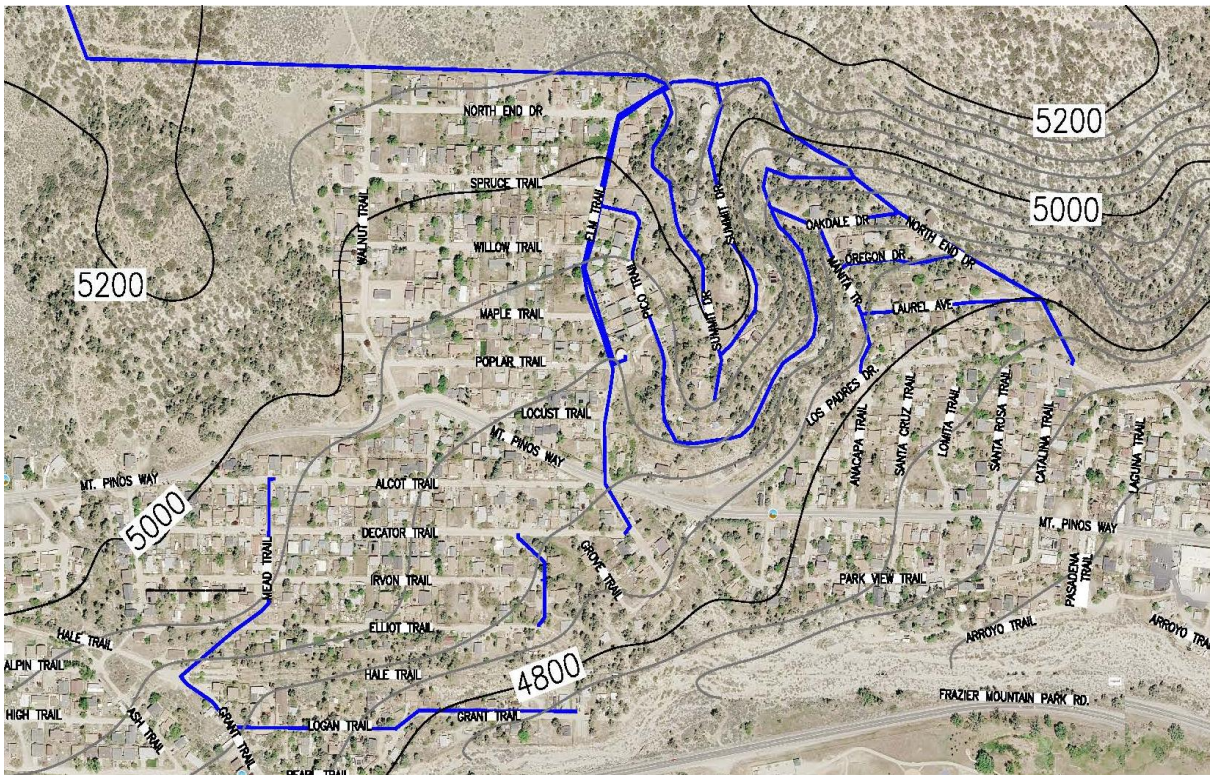
APPENDIX 2

FRAZIER PARK PUBLIC UTILITY DISTRICT

PIPELINE REPLACEMENT PROJECT

SUPPLEMENTAL ENGINEERS REPORT



MARCH 31, 2026

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March 29, 2026

Jonathan Miras, Project Manager
Division of Financial Assistance
State Water Resources Control Board
1001 I Street, 16th Floor
Sacramento, CA 95814
Via email

Re: Supplemental Engineer's Report – Pipeline Replacement Project
Frazier Park Public Utility District

Jonathan:

Enclosed is the above Supplemental Engineer's Report for the above-referenced project. The report was prepared in accordance with the Engineering Document Guidance format.

I have also included, as a separate submittal, the Construction Cost Estimates in the format of the Scope of Work document: one for the Well 8 Project, one for the Pipeline Replacement Project, and one combining the two projects.

All documents will be uploaded to the Portal.

Sincerely,

Dee Jaspar, P.E.,
District Engineer

PIPELINE REPLACEMENT PROJECT

SUPPLEMENTAL ENGINEERS REPORT

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FRAZIER PARK PUBLIC UTILITY DISTRICT

PIPELINE REPLACEMENT PROJECT

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EXECUTIVE SUMMARY

MARCH 31, 2026

Executive Summary

Introduction

This Supplemental Engineers Report provides the information requested on the EDWG Project Proposal Form, Attachment 2 – Engineering Document Guidance. The information presented in this report supplements information previously uploaded to the Waterboards FAAST Portal. These include, among other documents:

- Project Proposal Form
- Scope of Work Form
- Self-Certification Form
- Abbreviated Water System Capacity Review
- Project Construction Cost Estimate
- Project Construction Schedule
- Construction Management Cost Estimate
- Approved Plans and Specifications

Background – The Problem

This Pipeline Replacement Project is the replacement of 18,000 feet of existing distribution pipe with PVC pipe. The replacement locations are shown on the plans and specifications, and on the attached map of the Frazier Park service area. The pipe being replaced is aged bare steel pipe installed in the 1950s-60s.

Frazier Park is located in mountainous terrain. Pipelines run throughout the community. Many miles of these pipes are old, corroded, and at risk of failing. So far, the main consequence has been financial. No one has been injured, but property damage has occurred. The district allocates about $40,000 each year for fixing broken pipes. The costs of property repairs are either covered by insurance or paid by the district if they are not too high. When breaks occur in the elevated parts of Frazier Park, especially in the Summit and adjacent areas, uncontrolled water from the failures can damage properties downhill. Usually, this causes external damage, but sometimes water enters structures. This initial series of pipe replacements focuses on the parts of the system most likely to fail.

Existing Facilities

The district has two active wells: Wells No. 5 and 6. The combined capacity of the two wells is 450 gpm. Well 5 is about 60 years old now and has experienced casing failure. It has been patched with swedged steel liners. This reduced its capacity from about 500 gpm to 220 gpm. Well 6 is about 10 years old. It is in good shape, and has a capacity of 230 gpm. Therefore, the total production capacity is 450 gpm. The district is planning two new wells: Wells 8 and 9. Well 8 is the subject of an application for EDWG funding. Well 8 will replace Well 5. Well 9 is part of the Frazier Park – Lake of the Woods Regional Water Project, which is currently being designed.

Well Capacities (gpm)		
Well #5	Well #6	**Total**
220	230	450

Water Quality

Water quality is acceptable, generally within Title 22 parameters, with occasional spikes in constituents common to Cuddy Canyon groundwater. These are; nitrate, fluoride, and uranium. Water quality is discussed in detail in the text of this Supplemental Report, but briefly, Wells 5 and 6 are in compliance for nitrate, except for one brief encounter for Well 5 in 2021. Fluoride levels hover around the MCL, with spikes up to 2.1 mg/L in Well 6 in 2021-22. Well 6 uranium levels hover around the MCL, and occasionally peaks at 21 pCi/l (2016-2018), but returns to levels below the MCL.

Storage

Frazier Park has 2,091,000 gallons (gross) of water storage capacity. The storage is distributed in nine tanks in the hills surrounding the community and one tank on the valley floor at Well 5. This storage is used to meet peaking demands when these demands exceed the combined capacity of the two wells.

Supply – Demand Study

Kern County Development Standards, Division 2, Chapter 2, Water Supply Requirements, specifies a range of peak hourly demands based on the three climate zones in Kern County: Valley, Desert, and Mountain. The Standards recommend that these capacities be compared with local water supply records, where available. This report presents the capacities for the existing number of connections in Frazier Park, with an additional 200 future connections, and compares this to the calculated peak demand based on Frazier Park records. Frazier Park's demands, based on local records, fall in the middle of the range. The results follow.

Peak Hour Demand = 1,500 gpm
Maximum Day Demand = 750 gpm
Average Day Demand = 500 gpm

Peak Hour Demand[1]		
FPPUD SYSTEM	Number of Connections	Range - Minimumn to Maximum Peak Hour Demand Metered Water Service
Existing System with ± 200 Additional Connections	1,500	800 - 2,100 gpm

1. Plate W5 Kern County Development Standards

Kern County Development Standards require that systems meet the Peak Hour Demand, the Maximum Daily Demand, and the Average Daily Demand, with specific combinations of wells and storage. These are:

1. Peak Hourly Demand or ½ Peak Hour Demand plus 1,500 gpm Fire Flow for 2 hours using wells and storage. In Frazier Park's situation this is 2,250 gpm.

2. With the most critical well off line, a minimum of 2/3 of the Peak Hour Demand (1,000 gpm) must be met for 2 hours by both wells and storage.

3. The Maximum Daily Residential Flow, equal to 1/2 the Peak Hourly Flow, (750 gpm) must be met by a combination of wells and storage for a period of three days.

Frazier Park's water system meets all three conditions. This is demonstrated in Table 8 in the body of this report is repeated below.

Frazier Park Public Utility District
Supply and Demand Analysis[1]

KCDS Section	Criteria Description	Demand[2] (gpm)	Quantity (gallons)	Well Capacity (gpm)	From Wells	From Storage	80% of Available Storage (gallons)	Compliance
202-3.01 Peak Hour	Wells and Storage One Hour	1,500	90,000	450	27,000	63,000	1,672,800	Yes
202-3.01 Maximum Day	Wells and Storage 24 Hours	750	1,080,000	450	648,000	432,000	1,672,800	Yes
202-3.01 Average Day	Wells and Storage 24 Hours	500	720,000	450	648,000	72,000	1,672,800	Yes
202-3.02(a)	Wells and Storaage 2 Hours	2,250	270,000	450	54,000	216,000	1,672,800	Yes
202-3.02 (b)	Wells and Storaage 2 Hours	1,000	120,000	220	26,400	93,600	1,672,800	Yes
202-3.03	Wells and Storaage 72 Hours	750	3,240,000	450	1,944,000	1,296,000	1,672,800	Yes[3]

1. Kern County Development Standards
2. Demands are calculated for the existing number of connections (approx 1,300) plus an additional 200 connections (total 1,500 connections).
3. This requirement is met if 62% of the storage (1.296,000 gal) is available. If less than that the well would have to be repaired in three days or less, or water would have to be hauled in from an outside source.

Distribution System Piping

A map of the distribution system is included in the appendix. Generally, the pipes are aged steel, but there are some asbestos-cement pipes, and even PVC pipes installed in certain areas. The

district has not retained records of the distribution system piping. The type of pipe is generally discovered when a pipe failure occurs. Some replacements have been done in the past, but no records were maintained. This replacement project focuses on steel pipe. A general map of the District's distribution system is included in the appendix. The District's General Manager started as a laborer many years ago and has maintained a record of the types of pipe that he has repaired over the years. He is therefore a good reference for determining the size and type of pipe installed throughout the District, particularly in the Summit area. Additionally, the District conducted a pipe location project in the Summit area a few years ago and now has a good record of the types, sizes, and locations of the pipes in that area. This information was used to design the Pipeline Replacement Project.

Operation and Maintenance

The district has a small staff. The operations and maintenance staff are combined. This staff operates the system, provides daily visits to the well sites and tank/booster plant sites, and performs the routine maintenance required. They also do the pipe failure repairs and pump and motor replacements. Outside contractors provide specialized services, such as pulling and repairing pumps and motors, SCADA system maintenance and upgrades.

Consolidation Analysis

The district is in the process of consolidating Lake of the Woods Mutual Water Company into the district's service area. The Sphere of Influence has been expanded to include the mutual water company. An annexation map has been created. The design of wells and a transmission line is underway. It is anticipated that the Regional Project will receive state grant funding in the next two-three years. The district is coordinating with State Waterboards and the Kern County Local Agency Formation Commission to accomplish this.

Alternative Analysis

The only viable solution to this aged, failing pipe problem is to replace the pipe. Doing nothing increases the risk of property damage and harm to service area residents.

Design Criteria

The design criteria is to provide a water supply that will meet state and county requirements for supply volumes and water quality. The engineering design criteria is listed in the body of the report. Design Standards are those of ANSI, AWWA, ACI, and ASTM.

Environmental Impacts

This is pipeline replacement project is being done under the provisions of CEQA Class 2 Exemption 15302(c) Categorical Exemption. Pre-construction surveys will be conducted.

Land Requirements

Existing pipeline right of way are being used for this project. The replacement pipe will be installed in the same right-of-way as the existing pipeline.

Construction and Site Considerations

The roadways and "trails" on which this project is being constructed are narrow and steep. Extra care will be taken to protect adjacent private property.

Cost Estimate

a. The construction cost estimate for this pipeline replacement project is: $12,200,520.

b. Non-construction and related costs: Construction Management & Testing Costs, and District Administration Costs: $1,897,328

c. Annual O&M Costs: No pipe breaks per year will save thousands per year in avoided costs.

d. Present worth analysis involves comparing different options to determine which one offers the greatest financial benefit. The district's cost savings come from avoiding expensive pipe repairs and property damage. It expects to spend between $30,000 and $40,000 each year across the district. In the Summit area, pipe failures have caused property damage costs of up to $20,000. While the district has liability insurance to cover such damages, it prefers to pay these costs from district funds to avoid higher insurance premiums and the risk of losing insurance coverage altogether. Although it's hard to predict the exact savings from replacing part of the system, if just one failure occurs each year in the Summit area, the district could save $20,000 or more.

e. Life-cycle costs are tabulated in Appendix 4. These costs do not include contingencies. Some components have 50-year lives while others have 25-year lives. Costs are expected to increase at an average rate of 3% per year over the component's life. The future cost of the $10,167,100 initial cost is $39,518,443. Estimating the district's investment rate of return at 4%, the present worth is $8,004,798.

Advantages/Disadvantages

The advantages of the pipeline replacement project are:

- Reduced risk to private property
- Reduced O&M costs
- Reduced risk of contamination of the water supply
- Reduced environmental damage
- Reduced equipment emissions
- Reduced water loss
- Improved fire suppression system

The disadvantages are:

- Emissions of construction equipment
- Disruption of neighborhood traffic
- Noise levels increased during construction

Alternate Analysis

There is no viable alternative to this project.

The Selected Project

The project is the replacement of 18,300 feet of aging, failing steel pipe with PVC pipe, along with new line valves, fire hydrants, and service connections.

A schematic map of the project is included as Figure 1.

The only viable project is to replace the old, failing steel pipe with new PVC pipe.

District staff will be freed from pipe repair duties to perform other needed tasks. Maintenance costs will be reduced. The pipeline replacement project benefits the district's Operation and Maintenance functions.

Water loss from pipe breaks in this system is significant. Installing new pipes will reduce water loss. This project will save water, thereby boosting drought resiliency.

Response to Climate Change

A dryer climate makes conserving water even more critical. The Cuddy Canyon is the primary aquifer for Lake of the Woods and Frazier Park. Extended droughts impact water supply and quality.

Communities in the Cuddy Canyon Groundwater Basin adapt to decreased groundwater availability by reducing extractions. Frazier Park's wells are located within a more favorable portion of the basin and generally experiences less impact than wells in Lake of the Woods. The basin is typically shallower and narrower in Lake of the Woods. Water quality is similar in both areas, with levels near the Maximum Contaminant Levels in both communities. Well yields in Lake of the Woods are lower than in Frazier Park and suffer greater capacity reductions during droughts. Lake of the Woods blends groundwater to maintain acceptable water quality, while Frazier Park generally has acceptable quality with occasional exceedances of MCLs. Water quality in both communities worsens during extended droughts. In severe droughts, Lake of the Woods imports water from Frazier Park and other sources. Additionally, Lake of the Woods has supplied water to Frazier Park during disruptions caused by equipment failures or other emergencies.

Subsumed Water Systems

The Pipeline Replacement Project is not a consolidation project. However, the consolidation of Lake of the Woods Mutual Water Company into Frazier Park Public Utility District is being planned under a separate Waterboards grant.

Land Acquisition

No land acquisition is planned for the Pipeline Replacement Project.

Water Demand

A Supply/Demand analysis was performed based on local water system records, and compared to the Kern County Development Standards. There is a small commercial district in Frazier Park, but no major water-consuming enterprises.

Estimated Useful Life

A replacement cost analysis is presented in Appendix 4. An escalation factor of 3% and a 4% return on investments is used. The useful life of PVC pipe is 50 years, and 25 years for valves and appurtenances. The present worth of the future replacement costs is $8,004,798.

Detailed Cost Estimate

A detailed cost estimate is presented in Appendix 3. Construction line items include each item's description, measurement unit, quantity, unit cost, and total price.

Non-construction items are separately priced.

Proposed Schedule

A Gantt chart for the project is included, with an assumed construction start date of March 1, 2027. See Appendix 5.

Schematic Map

A schematic map of the pipeline replacement project is included as Figure 1 in the body of the report. A complete set of the approved construction plans and specifications has been submitted to the State Portal.

FRAZIER PARK PUBLIC UTILITY DISTRICT

PIPELINE REPLACEMENT PROJECT

SUPPLEMENTAL ENGINEERS REPORT

MARCH 31, 2026

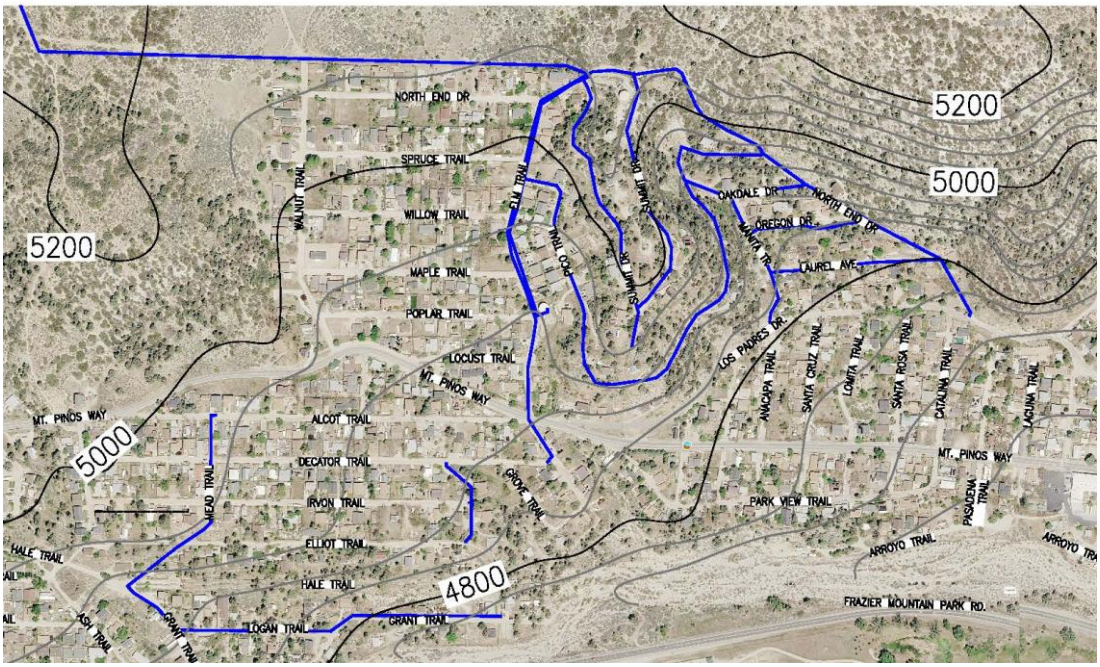


Figure 1

II. Background Project Information.

Frazier Park Public Utility District has 10 water storage tanks and two water wells. This project primarily focuses on the Summit Area, a portion of the District's service area. The District has approximately 100,000 feet of distribution piping, portions of which were installed in the 1950's-60's.

This project involves replacing 18,300 linear feet of the aging and failing distribution pipeline. It is composed of bare steel, unprotected by cathodic protection systems, installed in shallow trenches, exposed at ground level in some areas, and subject to corrosion and failure. Most of this pipe runs through steep, hilly terrain above residences, with few operable line isolation valves. These lines, which are gravity-fed from water tanks in the hills above the Summit neighborhood, often fail, draining the tanks partially or completely before the flow stops. This causes flooding of residential lots and, sometimes, homes, resulting in costly repairs and damage to landscaping and unpaved roadways. Fortunately, no injuries or fatalities have been reported from these failures. Figure 1 shows the project location. Replacement pipe alignments are colored blue. About 122 residences are affected. One pipeline, in Texas Trail, on the east side of the District, is not shown in Figure 1.

This Pipeline Replacement Project is focused on the Summit area and a few pipelines south of it that have proven to be troublesome in the past. Figure 2 is a close-up picture of the Summit area.

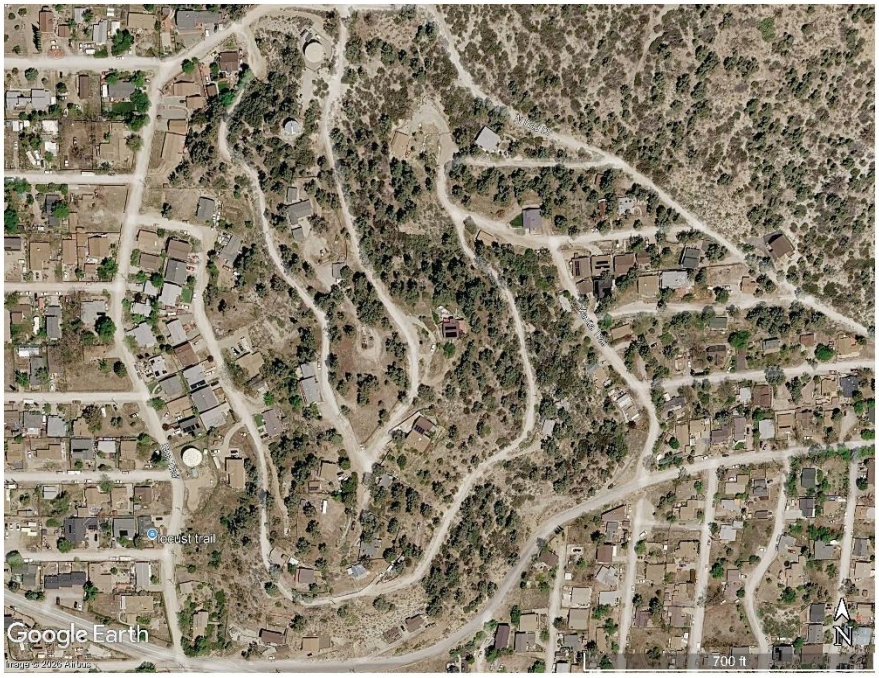


Figure 2

The District began recording failures in 2005. Failures that happen at night or during winter pose challenges due to darkness, rain, or snow, making them hard to access and dangerous for residents and repair crews. Roads in the Summit area are unpaved, and access for repair equipment is difficult because these roads, called "Trails," are narrow, steep, and often slippery.

1. Existing Facilities

Wells

The District is totally dependent on groundwater. The nearest surface water supply is the California Aqueduct located on the Tejon Ranch. At this time, it is economically infeasible to access surface water and treat it. The District has two active wells: Well 5 and Well 6.

Table 1

Frazier Park Active Wells

Well Capacities (gpm)		
Well No.5	Well No. 6	Total
220	230	450

2. Water Quality

Wells 5 and 6 have had occasional water-quality issues, but they meet Title 22 standards a majority of the time. Well, 5 had a nitrate issue in 2021, but that appears to have abated for now. The following is an excerpt from the EDWG Application for the Early Drilling of Well No.8, which was recently uploaded to the FAAST Portal. This is "Section 4" from that report discussing water quality in the Frazier Park area, and also presents results from the Test Well Drilling Program conducted in July and August of 2021.

Individual water quality records from the Engineering Report on Consolidation of Frazier Park and Lake of the Woods discuss the water quality of each of the Frazier Park wells through the year 2023. It follows Section 4, below. Test Well No. 1 is the test well for Well No.8, Test Well No. 2 is the test well for the proposed Regional Project Well No.9.

Section 4 from the Engineering Report on the Early Drilling of Well No.8
"Water Quality"

Frazier Park Wells
Frazier Park has three active wells, Wells No. 4, 5, and 6, but really two. Well No.4 cannot be run with Well No.6 because the two wells are only 100 feet apart. Well No.4 produces less than 100 gpm when operated alone. *Well No.4 is affected by the drawdown from Well No.6 (added 3-31-26 dj)*
Nitrates
Regional Report records go back to 2019.
Nitrates are below the 10 mg/L MCL for all three wells, except that Well No.5 exceeded the MCL in June 2021, likely due to the drought. It recovered quickly within a month of the exceedance, and has remained below the MCL since that time.
Records for Test Well 1 (future Well No.8) varied from 4.3 to 7.3 mg/l, being mostly in the 4.3 – 4.9 mg/l range, averaging 5.0 mg/l.
Records for Test Well 2 (future Well No.9) varied from 4.8 to 8.0 mg/l, averaging about 6.3 mg/l.

Fluorides
Records in the Regional Report go back to 2019.
Wells No. 4 and 5 have not exceeded the Fluoride MCL. Well No. 6 has had five exceedances since 2019, one in July 2019 (2.0), one in September 2020 (2.0), one in June 2021 (2.1), one in August 2021 (2.1), one in November 2022 (2.1).
Records for Test Well 1 varied from 1.6 to 1.9 mg/l, averaging 1.6 mg/l.
Records for Test Well 2 varied from 1.0 to 1.4 mg/l, averaging 1.2 mg/

Uranium
Regional Report records go back to 2021.
Uranium levels for Wells No. 5 and 6 are all below 20.0 pCi/l, although the levels vary from 17.2 to 19.0 pCI/l, mostly being in the range of 17.2 to 19.0 pCi/l.

Records for Test Well 1 varied from 7.1 to 9.0 pCi/l, averaging 8.1 pCI/l.
Records for Test Well 2 varied from 7.4 to 9.4 pCI/l, averaging 8.4 pCi/l.

Comment

Frazier Park wells generally meet the state MCL's for three of the most common contaminants found in Cuddy Canyon, with occasional exceedances in Fluoride levels at Well No. 6 and one Nitrate exceedance for Well No. 5. The future Wells No. 8 and 9 both are within the state MCLs for these contaminants.

The following is from the Frazier Park / Lake of the Woods Consolidation Project Preliminary Engineering Report issued in June 2024. The tables present the results of water quality testing for Frazier Park's Wells 5, 6, and 4, as well as the findings for the two previously mentioned Test Wells. Well No. 4 is about 100 feet away from Well No. 6, in Frazier Park's equipment yard. It is a shallow well that would not used unless Well No. 6 were to fail. It is a candidate for abandonment, but the District has not yet decided to proceed.

Each major contaminant is presented for each well: Nitrate, Fluoride, and Uranium. These are the major contaminants in Cuddy Canyon, from which most, if not all, wells draw water. This includes wells in Lake of the Woods, Frazier Park, and Lebec.

Table 2

Frazier Park Public Utilities District
Nitrate Concentrations (mg/l) - Peak Values for the Years Listed

Year	Well 5	Well 6	Well 4	TW #1	TW #2
2016	4.6	2.9	3.2		
2017	5.1	3.6	4.4		
2018	5.7	3.8	3.5		
2019	6.1	4.7	4.6		
2020	7.2	4.4	6.6		
2021	11.0	5.4	5.3	7.3	8.0
2022	8.2	5.0	3.6		
2023	8.2	5.2	5.8		

Table 3

Frazier Park Public Utilities District
Fluoride Concentrations (mg/l) - Peak Values for the Years Listed

Year	Well 5	Well 6	Well 4	TW #1	TW #2
2016	1.6	2.0	-		
2017	1.7	2.0	1.5		
2018	1.7	2.0	1.5		
2019	1.8	2.0	1.6		
2020	1.9	2.0	1.5		
2021	1.8	2.1	1.8	1.9	1.4
2022	1.8	2.1	1.5		
2023	1.5	1.8	1.5		

Table 4

Frazier Park Public Utilities District
Uranium Levels(pCi/l) - Peak Values for the Years Listed

Year	Well 5	Well 6	Well 4	TW #1	TW #2
2016	18.0	21.0	20.0		
2017	18.0	21.0	20.0		
2018	18.0	21.0	25.0		
2019	19.0	20.0	19.0		
2020	19.0	19.0	17.0		
2021	19.0	19.0	20.0	9.0	9.4
2022	18.3	18.8	-		
2023	17.2	18.4	-		

In 2021, the Waterboard's Tehachapi District required implementation of a Nitrate Corrective Action Plan for Well 5's nitrate issue. The Plan was implemented, and Well 5 has generally been in compliance since 2021. The Well is equipped with an emergency shut-off if the continuously-monitored nitrate levels approach the MCL. The SCADA system alerts the on-call operator to check the well and return it to operation as soon as possible.

3. Storage

Frazier Park has about 2 million gallons of storage in storage tanks located on the mountains surrounding the community. These tanks are filled at night and supply water by gravity during the day when demand exceeds the well capacity. The following are the storage details for the District. This table is from the EDWG application for Early Drilling of Well 8, on file in the FAAST Portal.

Table 5

Frazier Park Public Utility District					
Water Storage Details					
Tank Identification	**Approximate Elevation**	**Year Constructed**	**Age (as of 2023)**	**Gross Volume (gal)**	**Source**
South of Frazier Mountain Park Road					
Pine Canyon #1	4912	2012	11	125,000	Well No.6
Pine Canyon #2	5178	2012	11	163,000	Well No.6
Harrison Flats	4912	1966	57	125,000	Well No.6
Sam Young	5001	2013	10	167,000	Well No.6
Well #5	4578	2013	10	125,000	Well No.5
North of Frazier Mountain Park Road					
Magee	5411	2002	21	210,000	Well No.6
Elm Trail	4912	1966	57	211,000	Well No.6
Wolfe	5060	2003	20	335,000	Well No.6
Parcel "B"	4760	2003	20	210,000	Well No.5
Forestry	4913	2006	17	420,000	Well No.5
			Well No.5 Gross Storage	755,000	
			Well No.6 Gross Storage	1,336,000	
			Total	2,091,000	

Table 5 presents the storage volumes of all tanks in the District, their ages and locations, including the elevation of the base of each tank. Two (Elm Trail and Harrison Flat) are 60 years old now, and Elm Trail will require replacement soon. This is forecasted to be accomplished as part of the construction of the Regional Consolidation Project. It is planned to replace the Parcel B Tank this year due to excessive corrosion. All tanks are inspected every five years and repaired as needed.

4. Supply – Demand Study: Frazier Park Public Utility District

Kern County Standards

The County of Kern Water System Standards contain procedures by which municipal water demands can be calculated. These are contained in Division Two of the Kern County Development Standards. The Standards address the range of geographic areas within the county and are intended to be used as a guide. Local information, when available, can to be used to develop demands specific to a water supplier's service area. This information must be compared to the county standard to develop a sense of the validity of the local information.

Table 1 (Repeated)

Frazier Park Active Wells

Well Capacities (gpm)		
Well No.5	Well No. 6	Total
220	230	450

Demand Calculation – County Standards, Division 2, Chapter 2, Water Supply Requirements

Section 202-3 Required Residential Supply – General contains the county water supply requirements. After determining the number of connections in the service area, the peak hourly demand is determined from the Water Supply Requirements Chart, Plate W-5. From this number the maximum month daily residential flow and the average daily flow for the maximum month are calculated. This information is compared to water production information from Frazier Park. Frazier Park is a metered system. The following demands reflect metered connections in Frazier Park. As mentioned above, the county standards present a range of demands, depending on the geographic location of the system and whether or not the system is metered. The lowest demands generally occur in the mountain communities and the highest in the communities on the valley floor.

Table 6

Peak Hour Demand[1]		
FPPUD SYSTEM	Number of Connections	Range - Minimumn to Maximum Peak Hour Demand Metered Water Service
Existing System with ± 200 Additional Connections	1,500	800 - 2,100 gpm

1. Plate W5 Kern County Development Standards

Inspection of Frazier Park records shows that the maximum month water demands of record occurred in June 2020. In that month Frazier Park pumped 2,377,800 cubic feet. This is an average pumping demand of 412 gpm. The Peak Hour Demand generated by the county standards is three times the average day demand for the peak month, resulting in a Peak Hour Demand of 1,236 gpm. This is 0.96 gpm per connection (about 1 gpm per connection). Application of this Peak Hour Demand to the total number of connections in the current service area, with the addition of about 200 connections, results in a Peak Hour Demand of 1,500 gpm. The estimated Maximum Daily Demand is therefore 750 gpm and the Average Daily Demand is 500 gpm. Rounding these estimates to the nearest 100 gpm results in the following:

Peak Hour Demand = 1,500 gpm
Maximum Daily Demand =750 gpm
Average Daily Demand = 500 gpm.

A Peak Hour Demand of 1,500 gpm places it roughly half way between the Minimum and Maximum Peak Hour Demand generated by the Plate W5 of the county standards and appears to be a reasonable number to use for the following comparison in accordance with Chapter 2, Section 202 of the Kern County Water System Standards.

Section 202-3.01
Peak Hour Demand = 1,500 gpm
Maximum Daily Demand =750 gpm
Average Daily Demand = 500 gpm.

Section 202-3.02(a)
Peak Hour Demand = 1,500 gpm
½ Peak Hour Demand Plus Fire Flow = 1,500 gpm/2 + 1,500 gpm = 2,250 gpm
The Peak Hourly Demand or ½ the Peak Hour Demand plus the Fire Flow (1,500 gpm), whichever is greater, shall be met for 2 hours from a combination of sources and storage. Therefore, 2,250 gpm must be met for 2 hours from the sources and storage.

Section 202-3.02(b)
With the most critical pump or well inoperable, a minimum of 2/3 of the Peak Hour Demand (2/3 of 1,500 gpm) = 1,000 gpm, must be met for a 2-hour period by drawing from both wells and storage.

Section 202-3.03

The maximum daily residential flow shall be equal to ½ the Peak Hour Residential flow (1/2 of 1,500 gpm) = 750 gpm, and must be met from a combined source of wells and storage for a period of three days.

The results of this analysis are presented below in Table 7.

Table 7

Frazier Park Public Utility District

Supply and Demand Analysis[1]

KCDS Section	Criteria Description	Demand[2] (gpm)	Quantity (gallons)	Well Capacity (gpm)	From Wells	From Storage	80% of Available Storage (gallons)	Compliance
202-3.01 Peak Hour	Wells and Storage One Hour	1,500	90,000	450	27,000	63,000	1,672,800	Yes
202-3.01 Maximum Day	Wells and Storage 24 Hours	750	1,080,000	450	648,000	432,000	1,672,800	Yes
202-3.01 Average Day	Wells and Storage 24 Hours	500	720,000	450	648,000	72,000	1,672,800	Yes
202-3.02(a)	Wells and Storaage 2 Hours	2,250	270,000	450	54,000	216,000	1,672,800	Yes
202-3.02 (b)	Wells and Storaage 2 Hours	1,000	120,000	220	26,400	93,600	1,672,800	Yes
202-3.03	Wells and Storaage 72 Hours	750	3,240,000	450	1,944,000	1,296,000	1,672,800	Yes[3]

1. Kern County Development Standards

2. Demands are calculated for the existing number of connections (approx 1,300) plus an additional 200 connections (total 1,500 connections).

3. This requirement is met if 62% of the storage (1.296,000 gal) is available. If less than that the well would have to be repaired in three days or less, or water would have to be hauled in from an outside source.

5. Condition of the Water Supply System

5.a. Distribution System Piping

The District's distribution piping varies in age and type. There is some Asbestos-Cement pipe in the northwest corner of the District and at certain other locations, and even some PVC pipe in some areas. The Asbestos-Cement pipe has been performing well and will last for maybe ten or so years more, possibly longer. The old steel pipe installed in the 1950s-60s is a big problem, and a portion of it is the subject of this Expedited Grant.

In the past, the District did not keep thorough records of the distribution system piping. Although some piecemeal replacements occurred, the records have been lost. As a result, the District carried out a pipe location project in the Summit area a few years ago and now has detailed records of the pipe types, sizes, and locations in that area. This information was used to develop the Pipeline Replacement Project.

5.b. Water Supply Wells

Well 5, one of the wells, is now 60 years old and has recently undergone casing repairs. These repairs have extended the well's lifespan but did not resolve all problem areas in the casing, since they only blocked parts of the perforated sections. As a result, these repairs have already reduced the well's capacity by 50%. That is why the companion grant application, the Drilling of Well 8, is so vital to the District. This has been a critical need for several years.

6. Operations and Maintenance Program

District wells are visited one or two times a day to monitor operations and system pressures, tank levels, and to check for leaks and system anomalies. If any unusual operating parameters are observed, either on-site or via the SCADA system, the General Manager checks it out immediately. Water system security is monitored daily.

District storage tanks and booster pumps are inspected once or twice daily to ensure that pumps and control equipment are functioning properly. Water levels in tanks are checked using site gauges installed on the tanks, and tanks are monitored for leaks. Sites are inspected to confirm that fences remain intact and no equipment has been compromised. Tanks undergo internal inspections every five years.

Pipeline leaks are usually reported by water users. Staff monitors tank levels on the SCADA system. A sudden drop in tank levels often indicates pipe failures; however, alarms have not yet been developed to alert operators of potential issues.

7. A map of the District is included in Appendix 1.

III. Problem Description

The problem involves failures of old steel distribution pipes due to corrosion. Damage from flooding from pipe failures is most severe in the Summit Area, where water from pipe failures flows down steep slopes, flooding nearby residential areas. Floodwaters spread across lots, damaging landscaping, sidewalks, fences, and driveways. Several times, water has entered homes, destroying flooring, walls, fixtures, and furniture, and causing health issues such as mold growth. Repairs and replacements are costly. Fortunately, no injuries or deaths have been reported.

A map of the pipe failures is maintained by District staff. While failures are spread across the District, a concentration is observed in the Summit area and adjacent areas. The failure map is included in Appendix 2.

A map of land surface contours is included as Figure 1 on Page 1 of this report. The Summit Area and nearby regions are shown in detail in Figure 2 on Page 2. It is observed that the local roads ("trails") generally run parallel to the contours of the side slopes of the main ridge. The District's pipelines follow these trails, and when they fail, water flows downhill from the failures, affecting homes below. Figure 2 above shows the residences.

The solution is to replace the old corroded steel pipe with new pipe that can withstand the effects of corrosion. The pipe type selected is PVC.

IV. Consolidation Analysis

The District is consolidating Lake of the Woods Mutual Water Company into its District. The process is underway. The design of the required transmission mains, pumping plants, and wells is in process under a separate Waterboards Planning Grant. The Sphere of Influence has been expanded to include the mutual water company. An annexation map has been created. The design of wells and a transmission line is underway. It is anticipated that the Regional Project will receive state grant funding in the next two-three years. The District is coordinating with State Waterboards and the Kern County Local Agency Formation Commission. A Municipal Services Review has been prepared and submitted to LAFCo.

V. Alternative Analysis

1. Description

Alternative 1. Replace 18,300 feet of old, corroded steel pipe with new PVC Pipe. This includes 2 cased road crossings, 94 gate valves, 19 fire hydrant assemblies, 11 air release valves and protective enclosures, 122 new service lines to existing residences, 11 pressure reducing assemblies, 23 system-to-system interconnections, 6,000 square feet of ¾" aggregate base, and 6,000 square feet of asphaltic concrete paving. This project replaces a majority of the distribution system in the Summit Area of Frazier Park. The approved Pipeline Replacement Project plans and specifications have been uploaded to the Waterboards portal.

Alternative 2. Do nothing.

Not taking action will raise the risk of future damage to the homes and surrounding properties downhill from potential pipe failures, which are expected to increase as the old steel pipeline continues to corrode. The threat to human lives is very real, especially with a nighttime failure that may go unnoticed until after the damage occurs.

There are no feasible alternatives to this project. It is a replacement project that replaces existing infrastructure with new infrastructure at the same location (within a few feet) of the old infrastructure.

2. Design Criteria

System design is based on current water supply requirements for peak hour, maximum day, and average day as stated in the Kern County Development Standards, which includes fire suppression demands and storage requirements in the event of loss of a major water supply well.

ANSI/AWWA design criteria are followed for materials and installation. Pipelines are sized to deliver the required "50% of peak-hour plus fire flow" and to maintain pressures above 20 psi. See the system analysis on Pages 5-7.

Design Standards

1. Pipe Standards – Reference is to the latest revision
    a. Steel Water Pipe 6 Inches and Larger – butt welded, straight seam or spiral seam for transmission and distribution of water. ANSI/AWWA C200, AWWA M11
    b. Cement Mortar Lining and Coating for Steel Water Pipe ANSI/AWWA C205
    c. Field Welding of Steel Water Pipe ANSI/AWWA C206
    d. Dimensions for Fabricated Steel Water Pipe Fittings ANSI/AWWA C208
    e. Steel Pipe Flanges for Waterworks Service – 4 Inch-144 Inch ANSI/AWWA C207
    f. Fusion Bonded Epoxy Lining and Coating AWWA C213
    g. Polyvinyl Chloride (PVC) Pressure Pipe – 6 Inch to 48 Inch for Water Transmission and Distribution AWWA C900 and C905
    h. Ductile Iron Fittings for PVC Pressure Pipe ANSI/AWWA C110 and C111
    i. Ductile Iron Pipe AWWA C150/C151
    j. Ductile Iron Pipe Fittings AWWA C110, C111, C606
    k. Ductile Iron Pipe and Fittings - Cement Mortar Lining AWWA C104
    l. Ductile Iron Pipe – Polyethylene Wrap C105
    m. Reinforce Concrete Pressure Pipe, Non-Cylinder Type ANSI/AWWA C302
    n. Concrete Pressure Pipe, Bar Wrapped, Steel Cylinder Type ANSI/AWWA C303

2. Disinfection of Pipelines and Surfaces
    a. Surfaces ANSI/AWWA C653
    b. Piping ANSI/AWWA C652

3. Concrete
    a. Cement and Aggregate, Mixing and Placing ACI 318, ASTM C33, ASTM C260, ASTM C94
    b. Concrete Work ACI 301
    c. Testing of Concrete Aggregate for Alkali Silica Reactivity ASTM C1260, ASTM C 1567
    d. Concrete Mix Design / Testing ASTM C143, ASTM C39
    e. Cement ASTM C150
    f. Non-Shrink Grouts and Bonding Agents ASTM C1107, ASTM C827, ASTM C109
    g. Reinforcement ASTM A615, ASTM A185
    h. Transporting Concrete, Pumping Concrete ACI 304
    i. Hot Weather Concreting ACI 305
    j. Cold Weather Concreting ACI 306
    k. Curing Concrete ACI 308
    l. Building Code Requirements for Structural Concrete ACI 318
    m. Curing Compound ASTM C309

4. Miscellaneous
    a. Miscellaneous Structural Steel ASTM A36

b. Bolts, Nuts ASTM A307, ASTM A325
c. Galvanizing ASTM A93, ASTM A123, ASTM A153
d. Steel Water Pipe 1" and Smaller ASTM A120
e. Stainless Steel ASTM A316L

5. Valves
a. Gate Valves AWWA C509, ASTM 550
b. Butterfly Valves AWWA C504

3. Environmental Impacts

The pipeline replacement project will replace the old pipelines in the same rights-of-way, just a few feet away from the existing pipelines. The existing pipelines are installed in the roadways ("Trails"), as will be the new pipelines. See the approved plans.

The CEQA Class 2 Exemption 15302(c) Categorical Exemption reads: "A replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity of the structure replaced, including but not limited to: (c) Replacement or reconstruction of existing utility systems and/or facilities involving negligible or no expansion of capacity."

Construction impacts include emissions and noise from the construction equipment, as well as impacts on local traffic. Disruption of water service will be minimized, as the existing system will remain in service while the new system is being constructed. Changeovers will be coordinated with the local residents.

The proposed action has been determined to fall within the scope of the Class 2 Exemption. Section 15302(c).

4. Land Requirements

Existing pipeline rights-of-way will be used for this pipeline replacement project.

5. Construction and site considerations

The trails where the pipelines are installed are very narrow. Encroachments by adjacent landowners will be avoided if possible. If encroachments interfere with construction and cannot be avoided—especially those that have been there for many years—they will be removed with the owner's cooperation and can be reconstructed after the new pipeline is in place. The new pipeline has been designed to avoid most of these encroachments, but construction equipment may still impact them due to the narrowness of the trails.

6. Cost Estimate

a. Construction cost estimate is: $12,200,520. A detailed estimate is included in Appendix 3.

b. Non-construction and other related costs are: $1,897,328.

c. Annual O&M costs.

The District currently spends approximately $30,000-$40,000 per year on pipe and property damage repairs. This project will greatly reduce these costs. Failures in new piping systems generally occur in the first year of operation. A one-year warranty will protect the District for the first year of system operation. A properly installed pipe should not experience many failures thereafter. This cost has been conservatively set at $5,000 annually for the Summit Replacement Pipeline System.

d. Present worth analysis. There are no alternatives to which this solution can be compared; therefore, a present worth analysis comparing alternatives has not been conducted for this project. A present worth analysis involves comparing different alternatives to determine which one offers the greatest financial benefit. The District's cost savings come from avoiding expensive pipe repairs and property damage. It expects to spend between $30,000 and $40,000 each year across the District. In the Summit area, pipe failures have caused property damage costs of up to $20,000. While the District has liability insurance to cover such damages, it prefers to pay these costs from District funds to avoid higher insurance premiums and the risk of losing insurance coverage altogether. Although it's hard to predict the exact savings from replacing a portion of the system, if just one failure occurs each year in the Summit area, the District could save $20,000 or more in property damage costs.

e. Life-cycle costs. The new pipe system will last 50 years, and piping appurtenances about 25 years. The life-cycle cost, by component, is presented in Appendix 4. The replacement costs are escalated at 3% per year, and the District's return on investment is projected to be 4%. Annual contributions to a 50-year replacement fund would be $372,625.

7. Advantages/Disadvantages

The advantages of this project are: Reduction in District O&M costs; reduced risk to homeowners living downhill from the District's water distribution system, reduced risk of contaminated water due to breaks in the distribution pipelines, reduced environmental impact due to destruction of native habitat on the hillsides, reduced emissions due to equipment needed to repair broken pipelines and damaged landscaping and homes, the assurance of a reliable water supply with no disruptions in service, increased availability of water and new Fire Hydrants to fight fires in the neighborhood.

The disadvantages are disruption to the residents' normal traffic patterns in the Summit Area, construction noise, and construction-related emissions

A clearer way to convey this information is presented following:

Advantages

- Reduced risk to private property
- Reduced O&M costs
- Reduced risk of contamination of the water supply
- Reduced environmental damage
- Reduced equipment emissions
- Reduced water loss
- Improved fire-fighting water supply

Disadvantages

- Emissions of construction equipment
- Disruption of neighborhood traffic
- Noise levels increased during construction

8. Alternate Evaluation and Selection

There is only one alternative to the selected project: no project. This is unacceptable due to the risks of not doing the project.

VI. Selected Project

1. Description

The selected project is the replacement of 18,300 feet of old, failing steel piping with AWWA C900 PVC pipe, installing new residential services, 19 fire hydrants, and appurtenances. Details are provided in the Alternate Analysis above.

2. Schematic and map of the proposed facilities.

See the approved plans submitted on the Waterboards portal.

3. Justification

The selected project is the only viable alternative to provide the benefits described in Item V. 7. Above.

4. O&M

The project will reduce the time District staff spend repairing broken pipelines. It will reduce the time and expense the District incurs due to the time required to repair broken pipelines and clean up damage.

5. Drought Resiliency and Response

Every pipe break wastes a tank of water. The District staff often does not have enough warning of a pipe break to travel to the subject tank site and isolate the tank. Often there is high pressure due to elevation differences between the tank site and the break site, and this results in high water flows that rapidly drain the limited storage in the system. This project will save water, and every gallon counts.

6. Comprehensive Response to Climate Change

While opinions differ on the cause of climate change, there is no doubt that California is experiencing a drier period than in the twentieth century.

a. Vulnerability – Frazier Park P.U.D. and Lake of the Woods M.W.C. depend entirely on groundwater for their water supply. Drought-related groundwater depletion is a serious concern, which this firm addressed in the aforementioned Engineers' Report for the Regional Consolidation Project. In 2017, this firm initiated a geophysical study to map the Cuddy Creek groundwater basin between Lake of the Woods and Frazier Park. This was supplemented by an additional survey done in 2020. The study, undertaken to estimate the volume of groundwater in this selected portion of the basin, was based on 16 geophysical traverses (10 in 2017 and 6 in 2020). It concluded that the basin could endure a hypothetical seven-year drought cycle, involving 4 years of drought (no recharge) interspersed by 3 years of recharge.

An additional challenge in reducing groundwater levels is declining water quality. Frazier Park's favorable location, with about 75% of the Cuddy Creek watershed above it, provides some reassurance that sufficient precipitation within the watershed will meet the communities' minimal water needs. However, with a warmer climate, there is an additional risk. While the groundwater situation is not without risks, the basin’s communities have persisted for decades through periods of both abundance and drought.

The long-term solution is to secure a surface water supply to supplement the groundwater. Although it is very costly to build and operate, the existence of a surface water connection to the aqueduct by Tejon Ranch shows that bringing surface water to the lower basin near Lebec is possible. However, without a surface water contract, supply, treatment, and transmission facilities, and the ability to pay two to five times the current water rates, this option is problematic for these disadvantaged communities.

In the meantime, the only practical option is to drill wells in areas of the basin with the highest water volumes and best quality, where they can benefit from “mountain front recharge” and intermittent stream flows, such as Cold Springs Canyon.

b. Adaptation

The measures taken by the two entities during drought spells are to limit exterior watering and reduce interior use as much as possible. Both water suppliers monitor basin water levels to identify trends and implement water restrictions early when a drought year is anticipated.

c. Mitigation
Water and energy conservation is a way of life for the water users in this portion of the Cuddy Canyon. Solar has not been implemented due to cost and space requirements.

7. Subsumed Water Systems
The Pipeline Replacement Project is not a consolidation project. However, the annexation of Lake of the Woods Mutual Water Company into Frazier Park Public Utility District is being planned under a separate Waterboards grant.

8. Land Acquisition
Pipelines will be installed in existing easements. There is no need for additional land for this project.

9. Water Demand
See Section II.4, Pages 5,6, and 7 herein for a complete analysis of the existing water demands.
The Pipeline Replacement Project does not increase or decrease demands.

10. Estimated Useful Life
The estimated useful life for the components of the Pipeline Replacement Project are listed in in Appendix 4.

11. Detailed Cost Estimate for the Selected Project
A detailed cost estimate is included in Appendix 3.

12. Proposed Schedule
A Gantt Chart of the proposed schedule is included in Appendix 5.

13. Schematic and Map of the Proposed Facilities
The complete approved plans and specifications for the Pipeline Replacement Project have been uploaded to the Waterboards Portal. A schematic map of the project is included in Appendix 6.

Appendix

Appendix 1 – System Layout Frazier Park and Lake of the Woods (For Information Only)

Appendix 2 – Pipe Failure Map

Appendix 3 – Pipeline Replacement Cost Estimate

Appendix 4 – Life-Cycle Cost Estimate

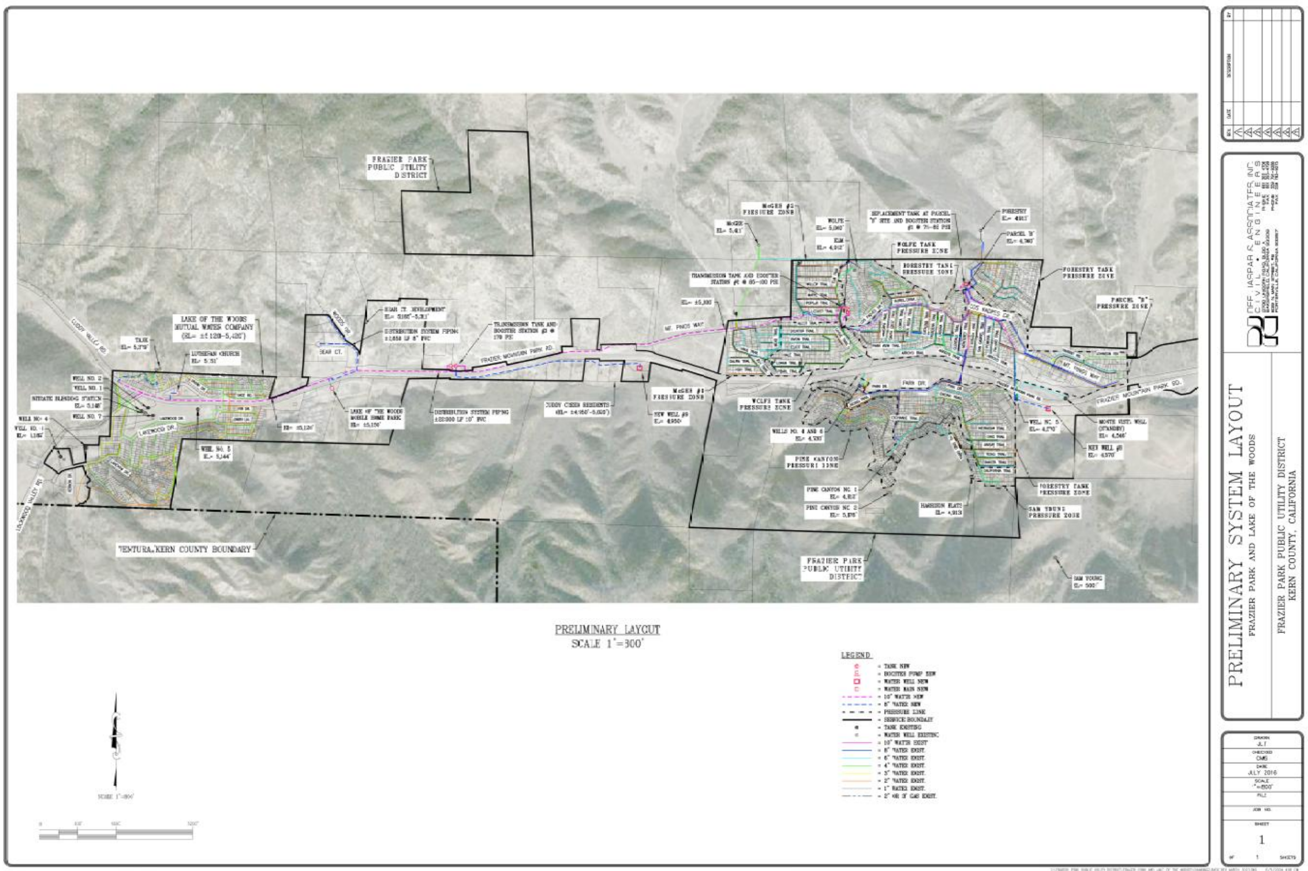
Appendix 5 – Project Schedule - Gantt Chart

Appendix 6 – Vicinity Maps

- Map 6a. District Map
- Map 6b. Summit Area
- Map 6c. Texas Trail

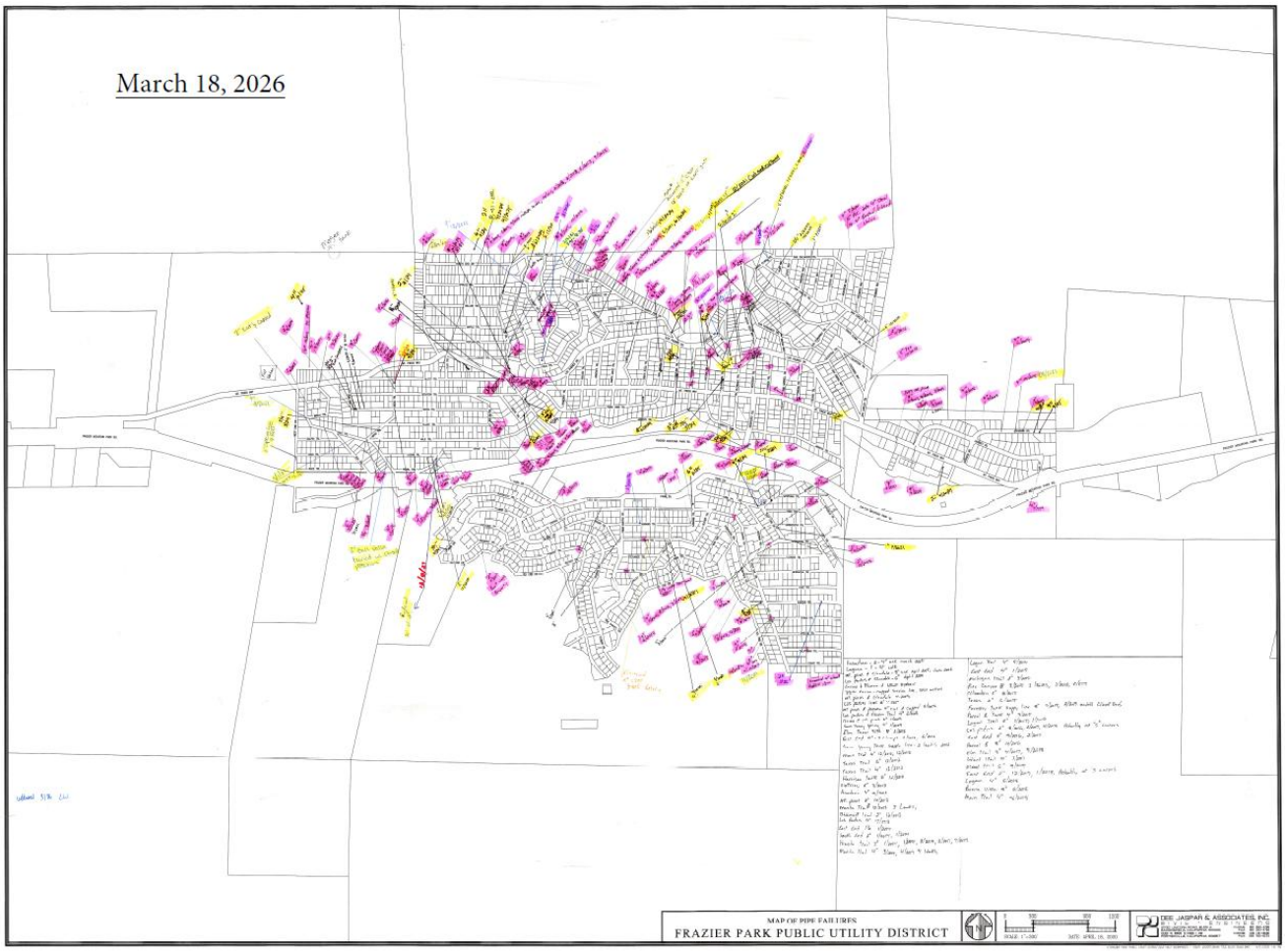
Appendix 1

System Layout Including Lake of the Woods



Appendix 2

Failure Map 2005 - 2026



Appendix 3

Pipeline Replacement Cost Estimate

Frazier Park Public Utility District					
Pipeline Replacement Project					
Preliminary Engineer's Estimate					
				Engineer's Estimate	
Item No.	Item Description	Quantity	Unit	Unit Cost	Extended Cost
1	Mobilization, Demobilization, & Cleanup	1	LS	$ 350,000.00	$ 350,000.00
2	Utility Locating and Potholing	1	LS	$ 75,000.00	$ 75,000.00
3	F&I 8" C900 DR 18 PVC Pipe & Appurtenances	18300	LF	$ 300.00	$ 5,490,000.00
4	F&I Cased Crossing at East End Trail	30	LF	$ 4,000.00	$ 120,000.00
5	F&I Cased Crossing at Mt. Pinos Way	80	LF	$ 10,000.00	$ 800,000.00
6	F&I 8" Gate Valve Assembly	94	EA	$ 4,000.00	$ 376,000.00
7	F&I Fire Hydrant Assembly	19	EA	$ 15,000.00	$ 285,000.00
8	F&I Air Release Valve Assembly	11	EA	$ 15,000.00	$ 165,000.00
9	F&I Water Service Line Replacement	122	EA	$ 2,500.00	$ 305,000.00
10	F&I Pressure Reducing Assembly	11	EA	$ 125,000.00	$ 1,375,000.00
11	F&I Temporary 4" Blow-Off Assembly	1	EA	$ 5,500.00	$ 5,500.00
12	Connections to Existing System	23	EA	$ 15,000.00	$ 345,000.00
13	Pressure Testing and Disinfection	1	LS	$ 25,000.00	$ 25,000.00
14	Sawcut Existing Asphalt Pavement	60	LF	$ 10.00	$ 600.00
15	Replacement of 3/4" Class II Aggregate Base	6000	SF	$ 25.00	$ 150,000.00
16	Replacement of Asphalt Concrete Pavement	6000	SF	$ 50.00	$ 300,000.00
				CONSTRUCTION ESTIMATE	**$ 10,167,100.00**
17	Construction Management including: Engineering & Geotechnical Support, Layout, Labor Compliance, and Project Inspection	1	LS	$ 1,692,328.00	**$ 1,692,328.00**
18	Construction Contingencies at 20% of Construction Cost	1	LS	$ 2,033,420.00	**$ 2,033,420.00**
				PIPELINE REPLACEMENT ESTIMATE	**$13,892,848.00**
19	Estimated Planning Costs - Apr 26 - Feb 27[1]				$ 55,000.00
20	Conditional Costs: CEQA, Legal[2]				$ 60,000.00
21	Administration - District Costs[3]				$ 90,000.00
				PIPELINE REPLACEMENT COST ESTIMATE	**$ 14,097,848.00**

Notes:

1. Estimate11 months at $5,000 / mo = $55,000.
2. CEQA Estimate $30,000. Legal Estimate $30,000.
3. District Administrative Costs during Project; Staff Costs, Bidding Process, and Contract Award = 15 months at $6,000 / month = $90,000.

Appendix 4

Life Cycle Cost Estimate

FRAZIER PARK PUBLIC UTILITY DISTRICT
Replacement Cost Analysis - Pipeline Replacement Project

Item	Description.	Quantity	Unit	Unit Cost	Extended Cost	Estimated Life (years)	Future Cost Escalation 3%	Present Worth ROI 4%	Future Cost (2_{nd} 25 Yr) Escalation 3%	Present Worth ROI 4%
1	Mobilization, Demobilization & Cleanup	1	LS	$350,000	$350,000	50	$1,534,367	$215,905		
2	Utility Locate and Potholing	1	LS	$75,000	$75,000	50	$328,793	$46,265		
3	F&I C900 DR 18 PVC Pipe & Appurtenances	18,300	LF	$300	$5,490,000	50	$24,067,644	$3,386,621		
4	F&I Cased Crossing at East End Trail	30	LF	$4,000	$120,000	50	$526,069	$74,025		
5	F&I Cased Crossing at Mt Pinos Way	80	LF	$10,000	$800,000	50	$3,507,125	$493,497		
6	F&I 8" Gate Valve Assembly	94	EA	$4,000	$376,000	25	$787,261	$295,315	$1,648,349	$231,943
7	F&I Fire Hydrant Assembly	19	EA	$15,000	$285,000	25	$596,727	$223,842	$1,249,413	$175,808
8	F&I Air Release Valve Assembly	11	EA	$15,000	$165,000	25	$345,473	$129,593	$723,344	$101,784
9	F&I Water Service Line Replacement	122	EA	$2,500	$305,000	50	$1,337,091	$188,146		
10	F&I Pressure Reducing Assembly	11	EA	$125,000	$1,375,000	25	$2,878,945	$1,079,941	$6,027,871	$848,197
11	F&I Temporary 4" Blow-off Assembly	1	EA	$5,500	$5,500	25	$11,516	$4,320	$24,111	$3,393
12	Connections to Existing System	23	EA	$15,000	$345,000	50	$1,512,448	$212,820		
13	Pressure Testing and Disinfection	1	LS	$25,000	$25,000	50	$109,598	$15,422		
14	Sawcut Existing Asphalt Pavement	60	LF	$10	$600	50	$2,630	$370		
15	Replacement of 3/4" Class II Aggregate Base	6,000	SF	$25	$150,000	50	$657,586	$92,531		
16	Replacement of Asphaltic Concrete Pavement	6,000	SF	$50	$300,000	50	$1,315,172	$185,061		
					$10,167,100		$39,518,443	**$6,643,672**	$9,673,089	**$1,361,126**

Replacemenet costs based on 3% escalataion over a 50 year period — **Present Worth of Future Replacement Costs** **$8,004,798**

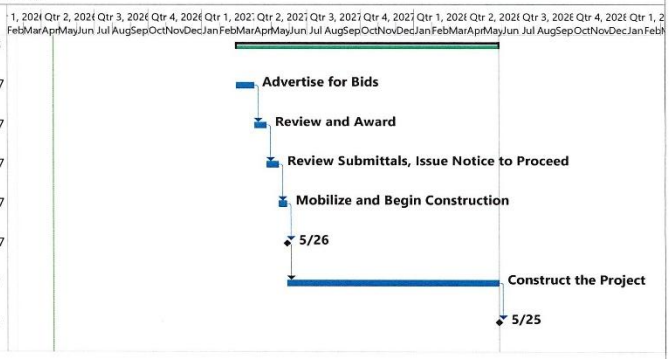
Present Worth of the replacenet costs at 4% return on investment = $8,004,798 — **Annual Fund Contribution Based on a 50 Year Sinking Fund** **$372,625**

Appendix 5

Project Schedule – Gantt Chart

FRAZIER PARK PUBLIC UTILITY DISTRICT
PIPELINE REPLACEMENT PROJECT

ID	Task Name	Duration	Start	Finish
1	**Pipeline Replacement Project**	**324 days**	**Mon 3/1/27**	**Thu 5/25/28**
2	Advertise for Bids	23 days	Mon 3/1/27	Wed 3/31/27
3	Review and Award	15 days	Thu 4/1/27	Wed 4/21/27
4	Review Submittals, Issue Notice to Proceed	15 days	Thu 4/22/27	Wed 5/12/27
5	Mobilize and Begin Construction	10 days	Thu 5/13/27	Wed 5/26/27
6	Begin Construction	0 days	Wed 5/26/27	Wed 5/26/27
7	Construct the Project	261 days	Thu 5/27/27	Thu 5/25/28
8	Final Inspection, Project Acceptance, Notice of Completion	0 days	Thu 5/25/28	Thu 5/25/28



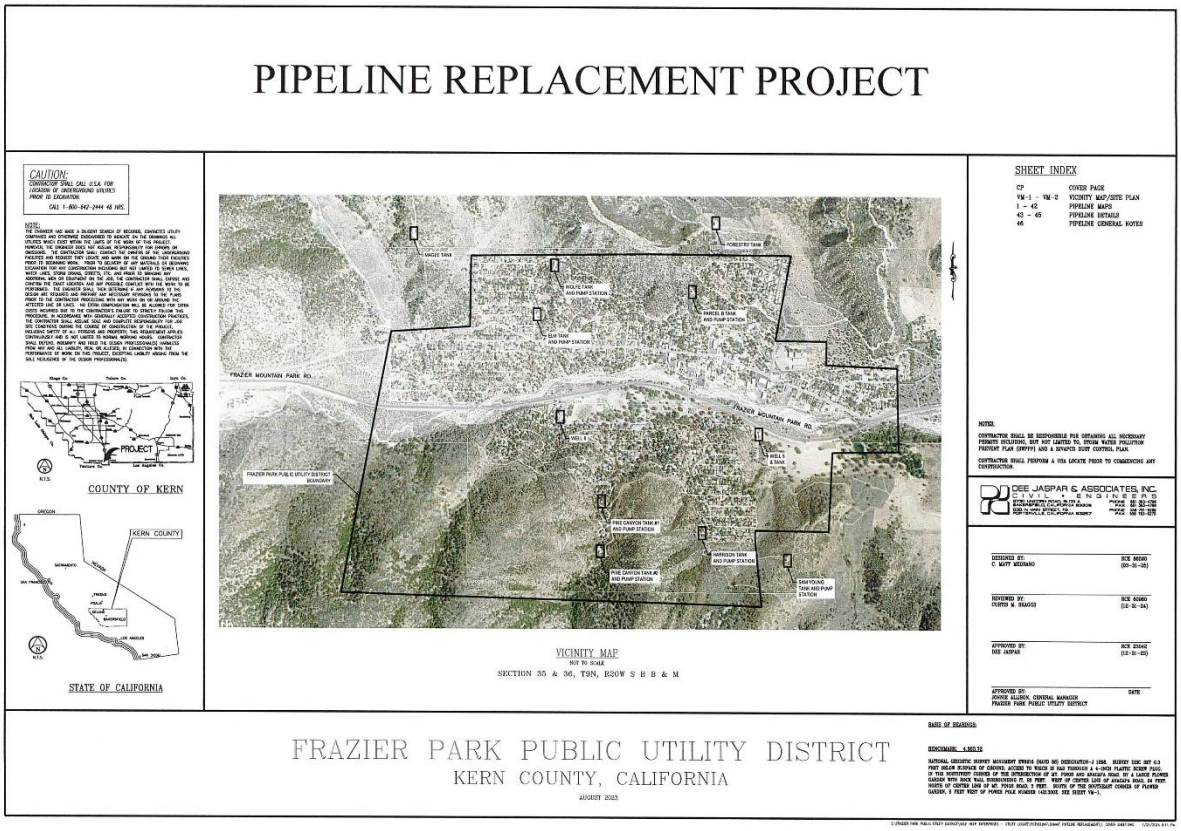
Project: Pipeline Replacement P
Date: Tue 4/21/26

Task	Project Summary	Manual Task	Start-only	Deadline			
Split	Inactive Task	Duration-only	Finish-only	Progress			
Milestone	Inactive Milestone	Manual Summary Rollup	External Tasks	Manual Progress			
Summary	Inactive Summary	Manual Summary	External Milestone				

Appendix 6

Frazier Park District Map

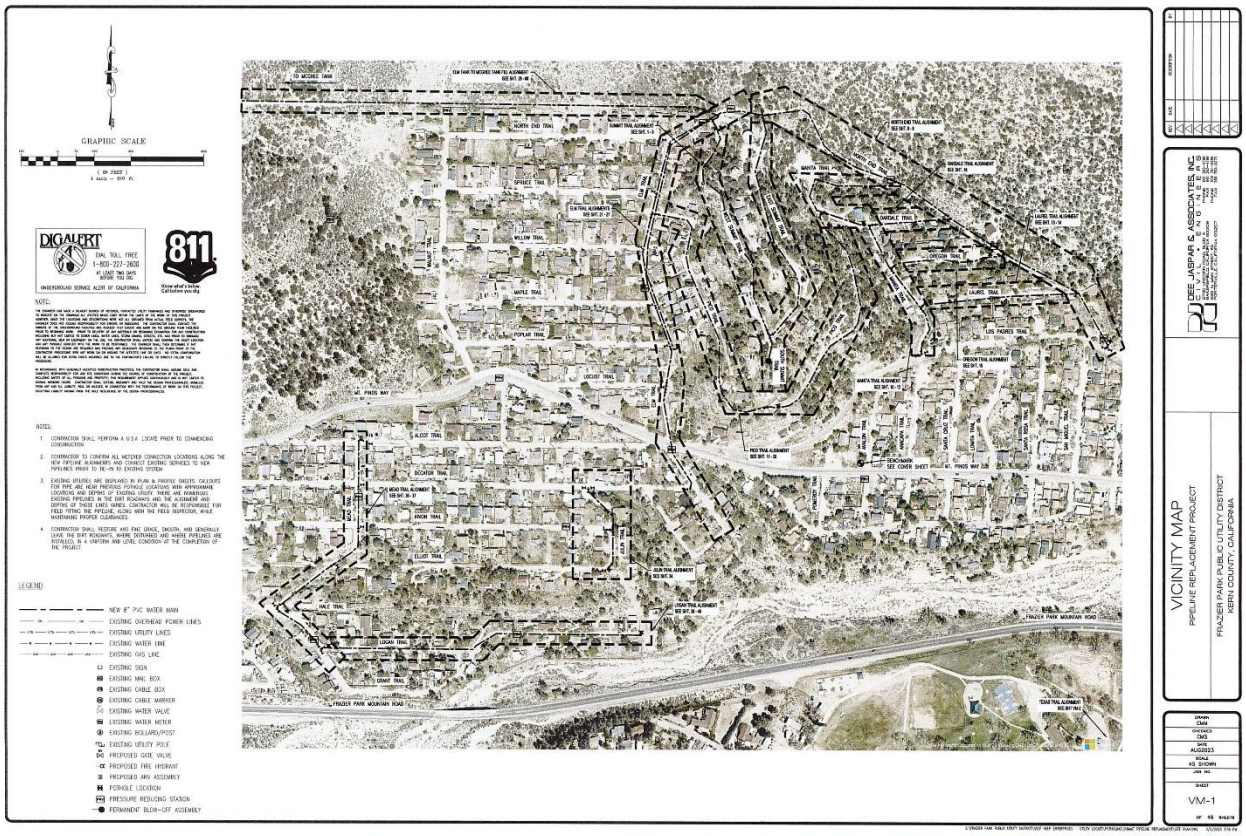
Map 6a



Appendix 6

Pipeline Vicinity Map – Summit Area

Map 6b



Appendix 6

Pipeline Vicinity Map – Texas Trail

Map 6c