

IMPROVEMENT DISTRICT NO. 4 REPORT ON WATER CONDITIONS 2022





Directors:

Ted R. Page
President
Division 1

Laura Cattani
Division 2

Martin Milobar
Vice President
Division 3

Eric L. Averett
Division 4

Charles (Bill) W. Wulff, Jr.
Division 5

Royce Fast
Division 6

Gene A. Lundquist
Division 7

Thomas D. McCarthy
General Manager

Amelia T. Minaberrigarai
General Counsel

Phone No. (661) 634-1400

Mailing Address
3200 Rio Mirada Drive
Bakersfield, CA 93308

February 1, 2023

Board of Directors
Kern County Water Agency
3200 Rio Mirada Drive
Bakersfield, CA 93308

Dear Members of the Board:

The *Improvement District No. 4 Report on Water Conditions 2022*, prepared as required by section 14.25 of the Kern County Water Agency (Agency) Act, is herewith filed with the Agency's Secretary of the Board of Directors (Board). This is the 50th in a series required for the setting of groundwater charges for funding operating costs of Improvement District No. 4 (ID4) project facilities.

This report describes surface and groundwater conditions for ID4 and includes estimates of water supplies and requirements for the Water Year July 1, 2023 through June 30, 2024.

Also included is an operating cost projection through 2023. This projection and the recommendations indicate the desirability of establishing a groundwater charge for the 2023-24 fiscal year. The information for setting this charge is contained in this report and is recommended for consideration at the public hearing to be held on Monday, March 20, 2023 at 3:00 p.m. in the Stuart T. Pyle Water Resources Center Board Room, located at 3200 Rio Mirada Drive, Bakersfield, California, at which time all interested persons may be heard.

Respectfully submitted,

A handwritten signature in blue ink that reads "Thomas D. McCarthy".

Thomas D. McCarthy
General Manager

I hereby acknowledge receipt of the *Improvement District No. 4 Report on Water Conditions 2022* and will make it available for examination by the public.

A handwritten signature in blue ink, likely of the Secretary of the Board.
Secretary of the Board

Enclosure

Improvement District No. 4

of the Kern County Water Agency

2022 Board of Directors

Division 1	Ted R. Page
Division 2	Laura Cattani
Division 3	Martin Milobar
Division 4	Philip Cerro
Division 5	Charles (Bill) W. Wulff, Jr.
Division 6	Royce Fast
Division 7	Gene A Lundquist
General Manager	Thomas D. McCarthy
General Counsel	Amelia T. Minaberrigarai

2022 Urban Bakersfield Advisory Committee

The Urban Bakersfield Advisory committee (UBAC) is charged with making recommendations to the Kern County Water Agency (Agency) Board of Directors (Board) on the Improvement District No. 4 (ID4) budget, water supply and water quality plans, and use of ID4 facilities. UBAC consists of nine members and nine alternate members appointed by the Agency Board.

California Water Service Company Tamara Kelly Rafael Molina (Alternate)	East Niles Community Services District Tim Ruiz, Chairman William McCalla (Alternate)
City of Bakersfield Art Chianello Tylor Hester (Alternate)	North of the River Municipal Water District Jim Tyack Doug Nunneley (Alternate)
City of Bakersfield Samuel Blue Luda Fishman (Alternate)	Kern County Water Agency Subcontractor Oildale Mutual Water Company Doug Nunneley Ryan Nunneley (Alternate)

Table of Contents

Definitions.....	1
Summary & Recommendations.....	3
Purpose	4
History of ID4.....	5
Water Supply & Requirements	7
Operations	11
Education	13
Planning & Engineering	14
Henry C. Garnett Water Purification Plant.....	15
Financial Aspects of the Project	17
Appendix.....	21

INTENTIONALLY BLANK

Definitions

Acre-Foot (af) - The quantity of water required to cover one acre of land to a depth of one foot (325,851 gallons).

Agency - Kern County Water Agency.

Agricultural Water - Water first used on land in the production of crops or livestock for market.

Aquifer - Porous water-bearing stratum or zone below the Earth's surface.

Central Valley Project - In Kern County, this refers to the Friant-Kern Canal and its service area.

Customers - Based on the new treated water contracts.

DWR - California Department of Water Resources.

Enterprise Fund - General operating fund used to fund ID4 operations.

ID4 - Improvement District No. 4.

In-Lieu Recharge: Use of a surface water supply for purposes that would have otherwise required the extraction of groundwater.

MCL - Maximum Contaminant Level - The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs (or MCLGs) as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

MCLG - Maximum Contaminant Level Goal.

MGD - Million gallons per day.

M&I - Municipal and Industrial - Generally refers to water used for domestic purposes.

PHG - Public Health Goal - The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

Potable Water - Water fit to drink pursuant to State and federal statutory requirements and aesthetic acceptability.

Project Water - Any combination of State Water Project water and additional water generated from the State Water Project, or from exchanges with Kern River interests or other sources.

Purveyor - Company or organization that provides a domestic water supply to a group of water users on a retail basis.

Small Groundwater-Producing Facility - Facility that has a discharge opening not greater than two (2) inches in diameter and does not provide water for an area in excess of 10,000 square feet.

SWP - State Water Project - In Kern County, its major feature is the Edmund G. Brown California Aqueduct.

Table A - The amount of water from the State Water Project allocated to ID4, according to the Agency's contract with the California Department of Water Resources.

TWCEP - Treated Water Capacity Expansion Project.

Very Small Groundwater-Producing Facility - Facility where, in the opinion of ID4 staff, the cost of collection would exceed the flat rate charge.

Water Year - The water year as referenced within this report refers to the first day of January through the end of December.

Summary & Recommendations

Based on the information compiled and presented herein, it has been determined that the amount of agricultural water withdrawn from the groundwater supplies of Improvement District No. 4 (ID4) for the year 2022 is estimated to be 1,353 acre-feet (af). The estimated amount of all other non-agricultural water withdrawn from the groundwater supplies of ID4 for the 2022 calendar year is 63,483 af (Table 6).

39,099 af (including Henry C. Garnett Water Purification Plant process) of treated surface water was delivered to water purveyors within ID4 during calendar year 2022 (Table 3). The Kern County Water Agency (Agency), on behalf of ID4, was obligated by contract to pay for 82,946 af of State Water Project (SWP) water in calendar year 2022 (Table 5). If the 2023 California Department of Water Resources (DWR) SWP allocation remains at 30 percent, Agency staff estimates that 24,884 af of water will be imported into ID4. Approximately 11,198 af of this water will be recharged as conveyance losses in delivering raw surface water to the Henry C. Garnett Water Purification Plant.

Agency staff developed a reserve policy to identify appropriate levels of accumulation within the ID4 Enterprise Fund. The 2022-23 treated water rate is set at \$179 per af. Total fund accumulation in the Enterprise Fund was \$12 million as of July 1, 2022 and is projected to be \$9.1 million as of July 1, 2023. The total fund accumulation includes recommended reserve levels as summarized below.

Reserve Designation	Balance
Acquisition of Additional Water	\$1,000,000
CVC Power Rate Stabilization	\$500,000
Capital Replacement	\$1,500,000
Catastrophe	\$2,000,000
Groundwater Banking	\$500,000

It is recommended that charges for groundwater production in ID4, for the fiscal year commencing July 1, 2023 and ending June 30, 2024, continue to be levied as follows:

1. Agricultural groundwater production: \$19.50 per af
2. All other groundwater production: \$39 per af
3. Small groundwater-producing facilities: \$39 (flat rate)
4. Very small groundwater-producing facilities: \$0 (no charge)



For administrative convenience, a flat rate annual charge of \$39 was levied for small groundwater-producing facilities, and no charge was levied for very small groundwater-producing facilities where the cost of collection would exceed the flat rate charge.

Purpose

This is the 50th in a series of annual reports on water conditions within ID4. This report is intended to provide information upon which the levying of groundwater charges for Fiscal Year 2023-24 is based. The first report, issued on October 1, 1973, detailed events leading to the formation of ID4 and formulation of a project plan for importing water from the California Aqueduct. Appended to the first ID4 report on water conditions are the full texts of the formation resolution and a resolution declaring an intention to establish groundwater charges within ID4. Appended to the 1993 report are two resolutions that amended the formation of ID4 (prior Resolution No. 17-71) by raising the maximum permissible groundwater charge to \$40 per af, thereby raising the cost of treated water to a maximum level of \$38 in excess of the maximum groundwater charge levied in a given year. These actions were superseded when the Agency Board of Directors (Board) adopted the ID4 Financial Management Plan in March 1999. The Board adopted the Revised ID4 Financial Management Plan (Revised Financial Plan) in January 2011, which updated the financial requirements and reserve policy of ID4 as a result of the Treated Water Capacity Expansion Project (TWCEP). In April 2016, the Revised Financial Plan was updated again.

In December 1972, the Agency published a Notice of Intent to establish a groundwater charge in accordance with section 14.22 of the Agency Act 9098 (Act). Following the Act, as amended February 17, 1982, requires that [such notice]:

All water-producing facilities (wells) located within ID4 shall be registered with the Agency by the owner or operator.

The Agency Engineer shall prepare an annual report by February 1 of each year.

A public hearing shall be held on the third Monday in March regarding the Engineer's report and to receive public testimony thereon.

Within 30 days after the close of the hearing, the Board shall determine whether a groundwater charge will be levied, and if so, shall set the charge.

Each owner or operator of a well shall file with the Agency, on or before January 31 and July 31 of each year, a statement of total water production for the preceding six months and shall pay the groundwater charges as determined on the water production statement.

The Act requires a projection of estimates of water conditions and requirements for fiscal years commencing July 1. SWP operations are based on a calendar year. Local hydrologic conditions have a substantial impact on the ability of ID4 to receive and spread its SWP Table A water. Therefore, this report presents hydrologic and operational histories for back-to-back calendar years for use in projecting fiscal year supplies and requirements as required by the Act. Plate 1 identifies irrigated agriculture,

municipal and industrial (M&I) areas determined via April 2022 aerial imagery of Kern County. Table 9 lists the acreage devoted to each land use classification within ID4 since 1972.

History of ID4

General

ID4 was formed by a resolution adopted by the Agency Board on December 21, 1971 to provide a supplemental water supply for portions of the urban Bakersfield area through the importation of water from the SWP. In order to have a means for transporting this supplemental water to ID4 from the California Aqueduct, the ID4 project included ID4's participation in the Cross Valley Canal (CVC). Upon reaching ID4, the imported supply was to be delivered directly to recharge areas for direct replenishment of the underlying groundwater aquifer or to the Henry C. Garnett Water Purification Plant for treatment and delivery to in-district water purveyors.

Creation of ID4

The Agency was formed by Chapter 1003 of the Statutes of 1961. The primary purpose for creating the Agency was the establishment of a single entity in Kern County to negotiate and administer a water supply contract with the State of California for its SWP. In November 1963, to provide a firm water supply to supplement the estimated safe yield of the underground basin, the Agency contracted with DWR for a water supply for member units within Kern County, which included 77,000 af annually for ID4.

Subsequent amendments to the Act added provisions for the formation of improvement districts as needed to expedite solutions to specific problems relating to flood control, drainage or water supply. Activities leading to the creation of ID4 were initiated by the Agency Board by adoption of Resolution No. 25-70 on December 10, 1970, which outlined the need for such an improvement district. ID4 was formed by a resolution adopted by the Agency Board on December 21, 1971 for the purpose of financing the construction of a water purification plant, related water conveyance facilities and a portion of the cost of the CVC. Resolution Nos. 16-71 and 17-71 were adopted by the Agency Board on December 21, 1971 to finalize formation activity and establish the boundaries of ID4 as they exist today. On September 12, 1972, an election was held within ID4 authorizing \$17.5 million of general obligation bonds to construct ID4's share of the CVC and water purification facilities, making the contracted water supply available to the areas of need within ID4. Five water districts in the easterly portion of the San Joaquin Valley in Kern County shared in the construction of the CVC to convey their water to their respective districts.

Historic Conditions

Prior to construction of the CVC, the primary water supply for all uses within ID4 was groundwater. The groundwater basin underlying ID4 receives its recharge from the Kern River, which traverses ID4 from east to west, a distance of about 12 miles, through a wide, flat, permeable bed. Historically, flood flows that overflowed on lands on both sides of the river contributed further to groundwater recharge. Seepage and percolation through a number of unlined canals provided another source of recharge.

In the 1860s, when the first settlers arrived in Bakersfield, water levels were close to the surface. These levels declined from 40 to 90 feet by the 1940s and pumping lifts of 100 feet or more were common. Due to the declining water table, the quality of the groundwater in portions of ID4 degraded as poorer quality water moved into the area from adjacent lands.

Section 14.25 of the Act requires that, “... the Agency Engineer shall annually prepare a report which shall include, among other matters which the Agency may desire, information on the availability of surface and groundwater in the improvement district, the quantity of water needed for surface delivery and for replenishment of the groundwater supplies within the improvement district for the ensuing water year, the amount of water which the Agency is obligated to purchase for use in the improvement district during the ensuing water year and an estimate of the amount of groundwater to be extracted within the improvement district during the ensuing water year.”

This report addresses establishing a groundwater charge for the fiscal year commencing July 1, 2023. However, the SWP operates on a calendar year basis. Water orders and payments for water are on the calendar year. Collection of tax funds by the County of Kern (County) and Agency bookkeeping are on a fiscal year basis. For this reason, many of the comparisons cited in this report refer to calendar year 2023, which overlaps the 2023-24 fiscal year.

Water Supply & Requirements

Availability of Surface Water and Groundwater

The annual surface water supply for ID4 includes a SWP Table A allocation of 77,000 af of M&I water and 5,946 af of firm agricultural water supplies for a total of 82,946 af. The annual Table A allocation received from the SWP is subject to reduction during drought conditions and regulatory requirements for environmental protection. Unless additional facilities are constructed to increase the SWP reliability, Table A allocation reductions will occur more frequently in future years.

The Board recognized the need for advanced planning to meet the water demand of a growing community and adopted Resolution No. 13-83 on June 23, 1983, stating that the Agency will do everything in its power to provide the urban Bakersfield area additional potable surface water supplies. The Agency completed studies to determine the timing and extent of needs for such additional potable water supplies and the best way to meet these needs. Resolution No. 21-93, adopted on May 27, 1993, established policy for meeting future water supply requirements of ID4 and the joint City/County 2010 General Plan Area.

On May 26, 1988, the Board adopted Resolution No. 12-88 allocating to ID4 10,276 af of firm agricultural water and 1,554 af of surplus agricultural water. This resolution provides 35 cubic feet per second (cfs) of additional flow capacity in the California Aqueduct through Reach 16 to the forebay of the A.D. Edmonston Pumping Plant. This water had been previously contracted to Wheeler Ridge-Maricopa Water Storage District.

In 1996, the Kern Water Bank property was transferred to the entities participating in the Kern Water Bank Authority. As payment for its share of the Kern Water Bank, ID4 returned 4,330 af of its SWP firm agricultural Table A allocation to DWR. This reduction is reflected in current ID4 SWP Table A amounts.

On March 30, 2016, in response to the Sustainable Groundwater Management Act (SGMA) ID4 executed the Memorandum of Understanding to form the Kern River Groundwater Sustainability Agency (Kern River GSA) with the City of Bakersfield and Kern Delta Water District and developed a Groundwater Sustainability Plan (GSP) to cooperatively manage shared groundwater resources in a sustainable manner. The Kern River GSA GSP Area covers 361 square miles, about 13 percent of the 2,834-mile Subbasin and is cooperatively managed by Kern River GSA member agencies. Local surface water from the Kern River, imported water from the State Water Project (SWP), recycled water and other surface water sources are used to support beneficial uses. These surface water sources are supplemented by groundwater and managed conjunctively throughout the GSP Area.

The Kern River GSA GSP was submitted in January 2020 in coordination with four additional GSPs that collectively cover the entire Kern County Subbasin, the largest groundwater subbasin in California. The Kern River GSA was amended in July 2022 in response to comments submitted by DWR. In April 2022, the Kern River GSA continued to coordinate with GSAs within the Kern County Subbasin to complete and submit the Kern County Subbasin Groundwater Sustainability Plans Annual Report for Water Year 2021. The Kern River GSA continued implementing its GSP by measuring and recording depth-to-groundwater levels in 39 monitoring wells within its monitoring network and implementing GSP projects and management actions.

On October 10, 2017, the Urban Bakersfield Advisory Committee (UBAC) expressed support to the Agency Board that ID4 continue to participate in California WaterFix (WaterFix) planning and design activities. In January 2019, Governor Newsom announced during his State of the State address that he did not support the WaterFix as configured but did support a one tunnel conveyance project. In May 2019, DWR rescinded its approvals of the WaterFix and began planning for a single tunnel option known as the Delta Conveyance Project (DCP). On November 16, 2020, UBAC recommended to the Agency Board that ID4 fund ID4's share of DCP environmental review, planning and design costs at a 100 percent level of 82,946 af.

Other supplies utilized to maximize replenishment operations in normal to wet years include interruptible water from the SWP (Article 21 water), water that is surplus to the Central Valley Project, water available from the Friant-Kern Canal and Kern River water. The amounts of 2022 SWP Table A water received are shown in Table 1, together with adjustments for exchanges and purchases. Actual historic deliveries are shown in Table 5. ID4 actively negotiates exchanges with Kern River interests for a supply of Kern River water.

Kern River supplies are delivered to agricultural water users in areas served by the City and Kern Delta Water District (Kern Delta) within ID4. Most of these agricultural service areas have dual supply systems allowing for the use of groundwater in dry years and Kern River water in wet years. Kern Delta supplied 1,837 af of Kern River water for agricultural use within ID4 in 2022.

Treated municipal effluent irrigated agricultural land in the southeast area of ID4. City and County sewage treatment plants in the southeast portion of ID4 treat and process wastewater, which is applied to agricultural areas south of Brundage Lane and east of Cottonwood Road.

Water Needed for Surface Delivery and Groundwater Replenishment

In 2023, ID4 needs about 50,000 af for direct deliveries to the purveyors, with an additional 26,400 af for canal losses and internal purification plant processing to allow for a maximum, non-interruptible supply

to the Henry C. Garnett Water Purification Plant. Water needed for surface delivery will be SWP water contracted for by the Agency on behalf of ID4 as described earlier in this report, and/or Kern River water obtained by purchase or exchange and/or water recovered from ID4's banking projects to augment surface supplies.

SWP Table A water supplies not required for the Henry C. Garnett Water Purification Plant are normally utilized for groundwater recharge. As of January 2023, the Kern River watershed is projected to be about 178 percent of normal. SWP supplies are projected to be at least 30 percent of SWP Table A water amounts, which results in an allocation to ID4 of 24,884 af. This supply is insufficient for full deliveries from the Henry C. Garnett Water Purification Plant. Additional supplies will be recovered from various banking projects to fulfill demand. In the past, natural replenishment of the basin's groundwater supply derived primarily from Kern River flows. When a dry year follows a period of heavy replenishment, rapid declines in groundwater levels adjacent to the river are noted as mounds dissipate.

Water Obligated for Purchase by the Agency

The Agency was obligated to pay for 82,946 af on behalf of ID4 in 2022.

Groundwater Conditions

Data collected by Agency staff indicates an average decrease in groundwater levels of 8.9 feet in 2022. In previous years, the change in groundwater levels has been calculated from contour maps generated from data collected in the fall (September through October). Comparing fall data can produce an erroneous interpretation in the calculation due to the large amount of groundwater extraction occurring in and adjacent to ID4 during the time it was collected. A more accurate calculation may be made by comparing data from mid-winter through early spring (January through March), due to the decrease in groundwater demand (pumping). Calculating the change in groundwater levels using data collected in the spring was instituted in 2011 (see Figure 1).

The average depth is weighted to account for the non-uniform density of monitoring wells within three distinct areas of the groundwater service area of ID4. These three areas consist of the area approximately north of Rosedale Highway, the area approximately south of Stockdale Highway and the Kern River area. These three areas are considered separately due to varying groundwater recharge practices, different groundwater extraction demands and geological considerations with respect to the relative ease of subsurface migration of groundwater. Plate 6 and Plate 7 depict the elevation of water in wells and depth to water in wells, respectively.

Estimated Groundwater Extractions

Groundwater extraction is closely related to land use within ID4. Agency staff has conducted annual land

use surveys since 1972. Data of historical land use within ID4 is shown in Table 9. The estimated amount of groundwater extracted in 2022 was 64,835 af (Table 6). Total reported groundwater production since 1976 is 3,748,805 af (Table 6).

Groundwater Replenishment

ID4 provides a treated surface water supply to replace a portion of groundwater pumping within its boundaries. The replaced pumping, or in-lieu recharge, combined with direct recharge of imported SWP or exchanged Kern River water replenishes the underground aquifer. Recharge made possible by water exchanges with Kern River interests commenced in 1971. Recharge using SWP water commenced in 1975 with the completion of the CVC. Actual amounts spread may vary from about 8,000 af of unavoidable seepage losses to over 90,000 af, depending on local and SWP water conditions and regulation afforded by exchanges.

Since 1971, ID4 has recharged 1,950,259 af. The SWP Table A water available for recharge or total in the same period was 977,601 af. The difference of 972,658 af was obtained from exchanges with Kern River or Friant-Kern Canal interests and banked water imports.

In-District recharge for 2022 was 10,763 af. The final SWP Table A water allocation was 5 percent and the Kern River runoff was 21 percent. (See Table 4 for detailed information.)

Operations

Banking

Kern Water Bank

ID4 has a 9.62 percent interest in the Kern Water Bank recharge and recovery facilities as a result of the 1996 agreement among project participants, the Agency and DWR. The number of recovery wells currently available is 95, yielding a total annual recovery capacity of approximately 180,000 af. The maximum annual recharge capacity of the project is about 600,000 af. ID4 recovered 18,710 af in the Kern Water Bank facilities in 2022.

Pioneer Project

ID4 has a 10 percent interest in the Agency-owned Pioneer Project recharge and recovery facilities as a result of the 1998 Pioneer Participation Agreement. The total number of completed wells on the project is 38, which yield a total annual recovery of approximately 100,000 af. The maximum annual recharge capacity of the project is about 250,000 af. ID4 recovered 2,624 af in the Pioneer Project facilities in 2022.

ID4 Recovery Program

ID4 currently owns four wells on the City's 2800 Acre Recharge Facility, located west of Allen Road and south of Stockdale Highway. These wells were drilled and cased in 1999 and remained idle during 2000 through 2002. In 2003, the project was completed with the installation of pumps, motors and pipelines. ID4's overall recovery capacity for this project is 20 cfs, or 12,000 af annually. ID4 recovered 7,901 af in the 2800 Acre Recharge Facility in 2022.

Allen Road Well Field Complex

ID4 owns and operates seven wells located along the north side of the Kern River between Allen Road and Coffee Road. ID4 can use the wells to enhance potential exchanges or for water quality benefits for the Henry C. Garnett Water Purification Plant. In 2022, ID4 recovered 26,210 af from the Allen Road Well Field Complex.

Improvement District No. 4 - Rosedale-Rio Bravo Joint Use Recovery Program

The Rosedale and ID4 Joint Use Groundwater Recovery Program (JURP) facility includes seven recovery wells with a total capacity of 45 cfs. ID4 operates this well field to recover banked water for two of Rosedale's partners, Kern-Tulare Water District (Kern-Tulare) and Arvin-Edison Water Storage District, with a maximum annual recovery capacity of 19,000 af. The JURP Agreement also provides ID4 with the ability to exchange surface water for an equal amount of banked water in the JURP area. In 2022, ID4 recovered 19,000 af on behalf of Rosedale's banking partners and 560 af for ID4 use.

Exchanges

Exchanges of SWP water for Kern River and Friant-Kern Canal water will typically improve the quality of raw water delivered to the Henry C. Garnett Water Purification Plant and water spread for replenishment of the groundwater aquifer. Also, there are savings to ID4 in reduced CVC pumping costs when the exchange entity can accept return of ID4 water in the California Aqueduct, or at locations west of the Henry C. Garnett Water Purification Plant. These power savings occur when ID4 does not have to pump the water easterly from the SWP through the seven lift stations on the CVC to bring it into ID4. The current power costs averaged for the year are \$4.21 per af at pumping plants one through seven, resulting in a total average cost of approximately \$29.50 per af when water is delivered the full distance from the California Aqueduct to the terminus of the CVC Extension. An activity table depicting exchange activity for 2022 is shown in Table 1.

In 2022, ID4 exchanged water with several entities to benefit all parties by saving costs, conserving supplies and keeping water quality consistent.

Summary of Groundwater Replenishment Activities

The total amount of direct, in-lieu and Kern River recharge incidental to ID4 operations since 1971 is shown in Figure 1. ID4 recharge in banking programs outside of ID4 boundaries, which also benefit ID4, is also included.

ID4 In-District Recharge (Table 4 – Direct Recharge)	1,950,259
Treated Water Supply (Table 3 – In-Lieu Recharge)	1,357,568
<hr/>	
Subtotal ID4 In-District Groundwater Replenishment Activities	3,307,827
ID4 Banked Water (Table 4)	425,622
<hr/>	
Total ID4 Project Water Supplies	3,733,449

Recharge of water incidental to the ID4 Project effort also occurs during Kern River flood years and through conveyance of Kern River water to others within ID4 boundaries.

Education

ID4 has historically participated in funding a comprehensive Water Education Program to educate local students about Kern County's water supplies, the importance of water and water use efficiency. The goal of the Water Education Program is to provide the public with the opportunity to make informed decisions when it comes to water use and conservation. The ID4 program incorporates teacher workshops, poster contests, curriculum materials, virtual presentations and classroom presentations. All curricula and instruction offered through the Water Education Program support the Common Core Standards and Next Generation Science Standards for grades Kindergarten-12th grade.

Water Education Program Components

Project WET – Project WET (Water Education for Teachers) promotes the awareness, appreciation, knowledge and stewardship of water resources. Project WET workshops maximize the time engaged in hands-on activities, help educators become familiar with teacher-designed features of the guide and provide opportunities to bounce implementation ideas around with fellow educators. Project WET activities provide step-by-step instructions making the activities very popular with California educators of all levels of teaching experience. Project WET activities are correlated to Common Core Standards, Next Generation Science Standards and California Environmental Education Initiative learning objectives.

ID4 is a facilitator for Project WET, and annually hosts a Project WET Workshop and Practicum session. In the 2021-2022 school year, 21 teachers from ID4's service area attended the virtual Project WET teacher workshop. The Project WET activities that were presented during the workshop were specifically tailored to easily integrate knowledge of local water resources and to highlight local water issues. Each teacher received a new Project WET 2.0 Guide (Guide). The Guide features 65 Kindergarten-12th grade Project WET activities to enhance student application of curricular skills in math, language arts, science and history/social science to the study of water. An additional feature of the Guide includes a website portal address that enables teachers to broaden their educational resources.

Poster Contest – Water Awareness Month is celebrated statewide in May, and ID4 celebrates the importance of water in the community by having students express how they can play a part in water conservation. As part of this commitment to water conservation, ID4 holds an annual poster contest for students in grades 1-6. In the 2021 poster contest, over 160 entries were received from 7 different schools within ID4's service area. From those entries, 12 winning posters were selected. The winners received an award of recognition, and their posters are displayed on the Agency's website. First, second and third place winners were presented with awards during year-end assemblies.

5th Grade Water Cycle Presentation, The Incredible Journey – This Project WET activity is conducted in the classroom. As part of the lesson, students role-play as a water molecule, which helps them to conceptualize the water cycle as more than a two-dimensional path. At the conclusion of the lesson, the students will have made a water cycle bracelet that describes their “Incredible Journey” as a water molecule. The objectives covered in the lesson include: the movement of water within the water cycle; the different states of water as it moves through the water cycle; the location of most of the water on Earth; and the concepts of evaporation and condensation. As a language arts extension activity, teachers have the option of having the students author a story about the water molecule’s journey. In the 2021-2022 school year, over 1,184 students within ID4’s service area participated in this activity.

Planning & Engineering

ID4 Construction & Maintenance Projects

East and North Pipeline Integrity Analysis: In September 2020, Agency staff began working with a consultant to evaluate the integrity of the North and East pipelines. Phase 1 has been completed which included a risk assessment, corrosion evaluation and preparation of a technical memorandum. The project moved into Phase 2a in 2021, to evaluate, inspect and rehabilitate certain portions of the facilities. In 2022, corrosion testing was complete on the North and East pipelines which identified two locations on the East pipeline that require repairs which will be addressed in 2023.

Oswell 0.5 MG Tank Interior Lining Project: The Oswell 0.5 MG Tank Interior Lining Project was bid and awarded in August 2022. Work on the facility began in October 2022 and is anticipated to be complete early 2023.

Temperature Equalization Pond Gates: The new gates to be installed at the outlet structure of the Temperature Equalization Pond were fabricated and delivered in 2022 and will be installed in 2023.

ID4 Recovery Wells, Pumps and Pipelines: Agency staff continued to perform maintenance and repairs as needed during the year to facilitate ID4 recovery well operations.

Henry C. Garnett Water Purification Plant

Operations

In 2022, the Henry C. Garnett Water Purification Plant delivered 36,032 af of water for domestic consumption. This represents a 5 percent increase when compared to the amount delivered in 2021 (34,377 af). Additional water was used for filter backwash, plant process use, sludge discharge and evaporation. The peak production flow occurred on August 3, 2022 and amounted to 55.8 million gallons per day (mgd). This represents 54 percent of the expanded maximum permitted flow of 103 mgd. The Henry C. Garnett Water Purification Plant did not operate at flows greater than design capacity in 2022.

The Henry C. Garnett Water Purification Plant's chemical costs were forty percent more in 2022 than 2021 (\$1,517,000 in 2022 and \$905,968 in 2021). This represents an incremental cost increase of approximately \$15.75 per af of water delivered for domestic purposes. This change is a result of changes in treated water chemical pricing. In 2022, chemicals consisting of sodium hypochlorite, aluminum sulfate, sodium hydroxide, cationic polymer, powdered activated carbon, zinc orthophosphate and sulfuric acid were used for water treatment processes. A detailed accounting of chemical consumption and a complete breakdown of the 2022 and historical operating costs are shown in Table 10. A history of water use by source is in Table 10A. Agency staff continued to use copper sulfate instead of potassium permanganate for algae control in the temperature equalization pond. In 2022, the utilization of copper sulfate as an oxidant continued to show a significant cost savings compared to potassium permanganate, with no impact to water quality.

Agency staff also conducted semi-annual well measurements within ID4. This included static water level monitoring of hundreds of wells in the metropolitan Bakersfield area.

Maintenance

Agency staff provided support and coordination for ID4 maintenance and construction projects to continue reliable and efficient operations, and to minimize treatment and distribution facility outages. Routine maintenance projects included drafting and implementing new preventive maintenance procedures and safety protocols, annual maintenance to Henry C. Garnett Water Purification Plant basins and treated water distribution pumps, annual cross connection control survey and backflow testing, vegetation removal and landscaping at various facilities, dewatering and cleaning of various storage tanks, oil sampling for pad-mounted electrical transformers, inspections of various facilities, updating the annual road permit with the City of Bakersfield and replacement of filter anodes as needed.

Agency staff also provided support for non-routine maintenance projects including the rehabilitation of East No. 5 pump and motor, upgrade of programmable logic controllers for the East, North and

Northwest Feeder Pumping Stations, upgrade of keyless door entries at the Henry C. Garnett Water Purification Plant, installation of a soft-start for Oswell Booster Pump No. 4 at the Oswell facility, installation of new Treatment Train A and B filter turbidimeters, installation of ports on the East and North pipelines for the pipeline integrity survey, installation of replacement head shafts for the Train A Sedimentation Basin No. 2, actuator replacement for the Train B master backwash valve, installation of a new vacuum pump and controls for the laboratory and installation of an upgraded fiber-optic line.

Laboratory

Title 22 and constituents of concern analyses were performed on the Henry C. Garnett Water Purification Plant treated and source water, and several groundwater wells. Treated and source water samples were also analyzed quarterly for 1,2-dibromomethane (EDB), 1,2-dibromo-3-chloropropane (DBCP), volatile organic chemical (VOC), general mineral, physical, metal and inorganic nonmetallic constituents, and monthly for general mineral, physical and inorganic nonmetallic constituents. The influent water supply, when consisting primarily of groundwater, was analyzed weekly for arsenic, conductivity and nitrate, and monthly for EDB, DBCP, VOCs and gross alpha as requested by the State Water Resources Control Board, Division of Drinking Water (DDW).

The distribution system was monitored weekly for coliform bacteria and physical constituents, monthly for total organic carbon (TOC) and total trihalomethanes (TTHM), and quarterly for regulated haloacetic acid (HAA5), TOC and TTHM constituents. Treated water was monitored every other week, and six distribution system sample locations were monitored twice a year for pH, calcium, orthophosphate and zinc as requested by DDW due to corrosion control treatment in the distribution system.

Kern River sanitary survey samples were collected quarterly and analyzed for general mineral, physical, coliform bacteria, TOC, dissolved oxygen and VOC constituents. Lake Isabella was monitored for VOCs following all holiday weekends, and Lake Ming was monitored periodically for VOCs following any drag boat races as requested by DDW.

Taste and odor samples were analyzed weekly in the warmer months and monthly in the cooler months to detect and avoid odor incidents. Multiple batches of copper samples were analyzed because of aquatic growth control measures occurring in the temperature equalization pond. VOC, motor oil, diesel and glycol samples were collected and analyzed in response to several vehicle crashes in the Kern River.

Financial Aspects of the Project

ID4 is an original participant in the construction of the CVC to convey water to the Henry C. Garnett Water Purification Plant and to the Kern River for groundwater replenishment. CVC construction was completed in 1976, and on February 29, 1980, Fox & Company completed a final construction cost audit. The audit was reviewed and accepted by the Agency Board. The total construction cost of the CVC was \$22,777,873, of which ID4's share was \$6,833,362.

Also, Fox & Company audited the ID4 construction fund to include the original Henry C. Garnett Water Purification Plant and treated water pipelines. This audit was completed on June 30, 1982. Updated construction costs since the two Fox & Company audits are summarized as follows:

CVC (ID4 share)	\$7,132,899
Purification Plant and Conveyance Facilities	\$25,755,025
Total	\$32,887,924

Annual Costs and Revenue

Cash flow for the fiscal year ending June 30, 2022, for all ID4 funds together with a forecast of cash flow conditions for the next fiscal year, is shown in Table 11. These projections are subject to change based on capital projects deemed necessary to the continued operation of ID4. The Agency Board adopted Resolution No. 14-16, which incorporated the Revised Financial Plan and established groundwater charges as well as a long-term surcharge on treated water rates. The new rates are projected to generate adequate revenues for the continued operation of the ID4 Project, while meeting ID4 debt service coverage requirements.

ID4 continues to look for ways to provide a supplemental water supply to metropolitan Bakersfield in a cost-effective manner. Under action taken by the Agency Board in 1996, Zone of Benefit credits are authorized to be used for the purchase of additional water from the State or federal projects. This measure was taken to mitigate the inability of the SWP to deliver 100 percent of Table A amounts annually. ID4 also works to reduce water pumping costs by exchanging SWP water for Friant-Kern and Kern River water. An optimum exchange can eliminate power costs for CVC pumping and potentially lessen the quantity of chemicals applied in the purification process. Chemical costs are affected substantially by the source and condition of the raw water. The availability of most exchanges cannot be predicted; therefore, power and chemical costs are budgeted conservatively by assuming use of the CVC for all but those exchanges currently in effect.

ID4 Funds

ID4 has four income sources managed within three fund accounts:

1. The ID4 Bond Fund was established to account for the receipts and disbursements of money needed to comply with the interest and redemption requirements of the bonds issued to construct the TWCEP. This fund will continue until the settlement of the debt incurred to construct the TWCEP. The interest and principal payments are being paid through a Capital Facilities Charge (CFC) as provided by the Agreements.

2. Zone of Benefit No. 7 was established in accordance with the SWP contract with the Agency dated November 15, 1963 to account for property taxes collected and interest earned on money held. Zone of Benefit No. 7 is used for the purchase of State or federal water supplies. The 2019-20 tax rate(per \$100,000) is \$40.34.

3. The Enterprise Fund is an operations fund established to account for money necessary for operation of the Henry C. Garnett Water Purification Plant, the treated water distribution system, groundwater replenishment and ID4's share of CVC costs. Expenditures are primarily for current day-to-day operating expenses and operating equipment. Revenues are recorded by source, principally water sales, groundwater pumping charges and interest earned on reserves. Revenues are derived from groundwater and treated water charges. The 2021-22 charges for each water type were \$19.50 per af for produced agricultural groundwater and \$39 per af for all other types of produced groundwater, and sales of treated water were at the rate of \$179 per af.

ID4 has no other regular revenue sources other than those described above. Money from the Enterprise Fund can be transferred into either or both of the other two funds to reduce the ad valorem tax burden, but excess revenues collected in the ID4 Bond Fund and Zone of Benefit No. 7 fund must remain in those funds. The estimated Enterprise Fund accumulation as of July 1, 2022 was \$12.0 million, including reserves of about \$1.5 million for equipment replacement, \$0.5 million for CVC power reserves, \$2.0

million for catastrophic needs of ID4, \$1.0 million for acquisition of additional surface water supplies and \$0.5 million for groundwater banking.

The present level of groundwater charges and sales of treated water are projected to yield approximately \$11.5 million. It is anticipated that the estimated operating revenues of ID4 will exceed the estimated expenses in 2022-23 primarily due to revenues received from water management programs implemented to benefit ID4 purveyors.

Well Registration and Collection of Groundwater Charges

Wells within ID4 are registered pursuant to Section 14.24 of the Act (Table 7).

On July 1, 2022, agricultural groundwater charges were \$19.50 per af, and charges for all other groundwater extractions were \$39 per af. For administrative convenience, a flat rate annual charge of \$39 was levied for small groundwater-producing facilities and no charge was levied for very small groundwater-producing facilities where the cost of collection would exceed the flat rate charge.

ID4 Financial Management Plan

On April 28, 2016, the Board adopted the Revised Financial Plan, which updated the previous versions of the ID4 Financial Management Plan. The Revised Financial Plan provides detail on the principles and practices to be followed in administering the financial resources of ID4. The Revised Financial Plan identifies the need for a long-term surcharge on treated water rates to address increasing costs associated with operation of the Henry C. Garnett Water Purification Plant and to meet ID4's debt repayment obligation. With the adoption of the Revised Financial Plan, the Board authorized the setting of rates and charges to ensure sufficient revenues to continue the ID4 project.

Refinancing of General Obligation Bonds

In November 2006, the Agency successfully retired the remaining balance of its \$17.5 million general obligation bond used to construct the Henry C. Garnett Water Purification Plant, the treated water distribution system and ID4's share of the CVC.

Sale of Certificates of Participation for Capital Projects

In 2006, ID4 issued \$27 million in water revenue Certificates of Participation (COP) to fund \$22.5 million of the TWCEP costs and refund the 1999 COPs. In 2008, ID4 issued an additional \$121 million in water revenue COPs to fund capital improvement projects associated with the TWCEP. In 2016, ID4 issued \$89 million in water revenue Refunding Bonds, which resulted in a total net present value of \$12

million in savings, by refunding the outstanding 2006 tax-exempt and taxable COPs, Series 2006A and 2006B, respectively, as well as the outstanding 2008 tax-exempt COPs, Series 2008A. In 2006, ID4 also entered into a low-interest loan agreement with the DWR Safe Drinking Water State Revolving Fund (SDWSRF) Program for \$2.82 million to fund the Oswell Bypass Project. The SDWSRF loan payments became due in 2010 and will retire in 2030. The SDWSRF loan is a parity obligation to the 2006 COPs.

Money to be used for the repayment of debt is provided for in the Agreements. The Agreements, and subsequent project agreements, include a contract provision for the biannual payment of a CFC to charge purveyors for all capital facility costs, including principal, interest and other costs associated with repayment of any debt incurred in the development and construction of the TWCEP. The Agreement will be effective through 2035, or until the COPs and any additional financing for the TWCEP are paid in full. Under the Agreements, each purveyor is responsible for its proportionate share of capital costs. The CFC is considered a “general obligation” expense of the purveyor, regardless of the amount of water delivered or whether the capacity is required for delivery of the purveyor’s water.

Appendix

Table 1 - 2022 ID4 Water Supplies, Exchanges and Deliveries

All units in acre-feet unless otherwise noted.

ID4 SUPPLIES	SWP ¹	SWP by Exchange ²	Kern River	SWP by Exchange ³	Bank Recovery	Total
SWP (M&I)	3,850					3,850
SWP (Ag)	297					297
2021 Carryover	9,280					9,280
City Non ID4			1,285			1,285
Recovered Supplies					54,308	54,308
Subtotal	13,427	-	1,285	-	54,308	69,020
ID4 EXCHANGES / OBLIGATIONS						
California Aqueduct					(5,000)	(5,000)
Belridge WSD (TRF22-065)					(1,388)	(1,388)
Belridge WSD (TRF22-079)		40			(40)	-
Belridge WSD (TRF22-085)					(307)	(307)
Berrenda Mesa WD (TRF22-068)					(1,219)	(1,219)
Berrenda Mesa WD (TRF22-086)					(269)	(269)
Kern Delta WD (TRF22-012)	(13,427)	21,829			(8,402)	-
Lost Hills WD (TRF22-069)					(2,348)	(2,348)
Lost Hills WD (TRF22-087)					(924)	(924)
Rosedale-Rio Bravo WSD (TRF22-045)		15,335			(15,335)	-
Tehachapi-Cummings CWD (TRF22-070)					(45)	(45)
Tehachapi-Cummings CWD (TRF22-077)					(190)	(190)
Total Exchanges/Obligations	(13,427)	37,204	-	-	(35,467)	(11,690)
Available Supplies	-	37,204	1,285	-	18,841	57,330

acre-feet

ID4 DELIVERIES	SWP ¹	SWP by Exchange ²	Kern River	SWP by Exchange ³	Bank Recovery	Total
Henry C. Garnett Water Purification Plant		27,609	895		10,595	39,099
In-District Transportation Recharge		9,595	390		2,063	12,048
In-District Recharge						-
Out of District Losses					3,912	3,912
Carryover to 2022					2,271	2,271
Total Deliveries	-	37,204	1,285	-	18,841	57,330

Table 2 - ID4 Water Recharge and Recovery Asset Summary

All units in acre-feet unless otherwise noted.

Groundwater Banking Facility	ID4 Interest	Annual Recharge Capacity	Annual Recovery Capacity ⁶	ID4 Recharge Capacity	ID4 Recovery Capacity	Summary of Banked Water
Kern Water Bank	9.62%	600,000	180,000	57,720	17,316	138,041
Pioneer Project	10%	250,000	100,000	25,000	10,000	37,337
ID4 Banking Wells ⁴	100%		12,000		12,000	4,114
ID4/Rosedale Joint Use Recovery Project ⁵	22.2%		21,000		5,940	5,828
Allen Road Well Field	100%		36,000		36,000	105,661
Total		850,000	349,000	82,720	81,256	290,981

¹ SWP allocation for 2022 was 5 percent.

² SWP water by exchange with Kern River interests.

³ SWP water by exchange with Friant-Kern interests.

⁴ ID4 recovery wells and banked water in City of Bakersfield's 2800 Acres Recharge Facility.

⁵ First priority for 10 cfs of recovery capacity.

⁶ Recovery capacity varies with respect to depth to groundwater.

Table 3 - ID4 History of Purification Plant Water Use by Sources

Units in acre-feet unless otherwise noted.

Year	State Water Project		Kern River	State Water Project		Recovered	Total Treated Water Supply
	State Water Project	by Exchange ¹		by Exchange ²			
1975							-
1976							-
1977	15,950						15,950
1978	8,329	15,607					23,936
1979	5,347	21,078					26,425
1980	4,288	18,551					22,839
1981	20,457	3,407					23,864
1982	3,584	21,488					25,072
1983	1,287	23,317					24,604
1984	21,068	5,200					26,268
1985	942	23,331					24,273
1986	1,487	22,967					24,454
1987	1,974	23,534					25,508
1988	7,971	21,360					29,331
1989	11,844	15,593					27,437
1990	24,728	2,694					27,422
1991	2,467	9,146				7,719	19,332
1992	6,830	8,442				12,241	27,513
1993	4,653	23,414		2,883			30,950
1994	4,030	20,680		715	4,186		29,611
1995	2,528	28,883			222		31,633
1996	24	28,527		1,387			29,938
1997		25,416		7,980			33,396
1998		26,510		1,906			28,416
1999		28,340					28,340
2000	132	29,023					29,155
2001	3,503	7,579				15,810	26,892
2002	5,228	21,327				1,194	27,749
2003	9,826	14,011				2,111	25,948
2004	4,282	14,419				6,693	25,394
2005	1,967	24,320				787	27,074
2006	7,160	18,412					25,572
2007	4,826	14,874				7,301	27,001
2008	1,462	25,000					26,462
2009	-	28,335					28,335
2010	718	29,231					29,949
2011	2,473	20,751	13,021				36,245
2012	22,272	8,892	14,066				45,230
2013	2,554	19,049	3,007			13,051	37,661
2014		7,682	457			24,179	32,318
2015	963			121		27,948	29,032
2016	7,432	21,735	4,028	665			33,860
2017	3,551	22,257	14,142				39,950
2018	1,566	17,742	15,584	4,223			39,115
2019	12,877	20,291	7,588				40,756
2020	4,667	13,833	12,377	310	10,451		41,638
2021		12,510	2,855		21,256		36,621
2022	-	27,609	895	-	10,595		39,099
TOTAL	247,247	836,367	88,020	20,190	165,744		1,357,568

¹ SWP water by exchange with Kern River interests.

² SWP water by exchange with Friant-Kern interests.

Table 4 - History of Groundwater Replenishment by ID4

All units in acre-feet unless otherwise noted.

Year	% Allocation	Kern-River Runoff (% of mean) ⁴	SWP	Recovery ¹	SWP by Exchange ²	Kern River	Friant-Kern ³	In-District Recharge	Banked Water	Total
1971					6,400		-	6,400	-	6,400
1972					11,000		-	11,000	-	11,000
1973					67,500		-	67,500	-	67,500
1974					10,900		-	10,900	-	10,900
1975		81%	5,700		-		-	5,700	-	5,700
1976		23%	27,800		-		-	27,800	-	27,800
1977		20%	6,400		2,000		-	8,400	-	8,400
1978	100%	230%	1,470		37,840		2,990	42,300	-	42,300
1979	100%	88%	60,680		36,200		1,120	98,000	-	98,000
1980	100%	208%	23,210		23,230		3,460	49,900	-	49,900
1981	100%	53%	55,270		2,350		480	58,100	-	58,100
1982	100%	168%	5,480		35,810		2,110	43,400	-	43,400
1983	100%	325%	1,250		10,860		3,290	15,400	-	15,400
1984	100%	89%	15,690		5,120		1,690	22,500	-	22,500
1985	100%	89%	7,980		32,280		940	41,200	-	41,200
1986	100%	187%	22,530		68,000		2,220	83,423	9,327	92,750
1987	100%	44%	14,000		18,200		540	32,740	-	32,740
1988	100%	34%	5,210		29,850		-	35,060	-	35,060
1989	100%	50%	6,990		14,040		-	21,030	-	21,030
1990	50%	24%	10,713		3,116		-	13,829	-	13,829
1991	0%	59%	1,651		6,279		-	7,930	-	7,930
1992	45%	39%	2,574	1,750	4,437		-	8,761	-	8,761
1993	100%	126%	51,045	-	30,319		32,727	92,195	21,896	114,091
1994	50%	41%	24,671	-	15,250		193	30,005	10,109	40,114
1995	100%	199%	50,200	⁵ -	76,878		23,000	104,148	45,935	150,083
1996	100%	128%	58,934	-	65,281		13,283	85,232	52,266	137,498
1997	100%	122%	744	-	66,015		5,432	67,670	4,521	72,191
1998	100%	239%	17,642	-	45,680		4,793	40,427	27,688	68,115
1999	100%	53%	70,898	-	13,872		842	85,543	69	85,612
2000	90%	65%	26,304	-	22,843		4,699	46,054	7,792	53,846
2001	39%	54%	4,440	4,496	18,601		-	24,973	2,564	27,537
2002	70%	43%	7,537	-	43,904		-	41,258	10,183	51,441
2003	90%	70%	24,303	-	24,229		-	20,152	28,380	48,532
2004	65%	48%	20,018	2,640	14,466		-	35,152	1,972	37,124
2005	90%	169%	89,743	689	36,502		16,557	104,053	39,438	143,491
2006	100%	156%	89,601	-	38,962		12,831	107,938	33,456	141,394
2007	60%	26%	25,901	336	20,411		1,567	45,592	2,623	48,215
2008	35%	72%	2,179	124	34,530			10,371		10,371
2009	40%	63%			38,166			9,831		9,831
2010	50%	125%	8,469		56,426			34,946	645	35,591
2011	80%	201%	11,703		38,585	23,453	172	37,668	50,857	88,525
2012	65%	38%	30,969		12,828	18,898		17,465	-	17,465
2013	35%	22%	6,745	20,553	30,982			20,619	-	20,619
2014	5%	24%	-	38,441	15,931			22,054	-	22,054
2015	20%	18%	1,500	41,813			210	14,491	-	14,491
2016	60%	51%	13,411		36,426		1,000	16,977	-	16,977
2017	85%	260%	16,186		32,543	33,483		42,262	57,311	99,573
2018	35%	49%	4,613		25,702	21,450	4,883	17,533	-	17,533
2019	75%	197%	36,075		38,058	9,973		43,350	18,590	61,940
2020	20%	43%	9,172	10,451	15,884	8,353	404	2,626		2,626
2021	5%	15%	-	25,476	16,704	2,079		7,638		7,638
2022	5%	21%	-	12,658	37,204			10,763		10,763
TOTAL			977,601	159,427	1,388,594	117,689	141,433	1,950,259	425,622	2,375,881

¹ Recovered from wells on Kern Fan Element property (unavoidable losses in conveyance to Henry C. Garnett Water Purification Plant).² SWP water by exchange with Kern River interests.³ Acquired from Friant-Kern interests.⁴ Percentage of the 1894 to date, long-term average of the April-July snowmelt runoff at First Point.⁵ Estimated.

Table 5 - ID4 History of State Water Project (SWP) Entitlement and Actual Water Deliveries

All units in acre-feet unless otherwise noted.

		SWP SUPPLIES							ID4 Deliveries				SWP Supply Deficiency	Inability to Accept SWP Supply	
		Table A Entitlement		Table A Allocated	Long-Term Purchase	Surplus ⁹	Other	Total Supply	Deliveries		Total Deliveries	Carryover			
Year	SWP Allocation	M&I	Ag						Within ID4	Banked Water			Water Transfers		
1970	100%	18,700		18,700				18,700				-			18,700 ¹
1971	100%	22,100		22,100				22,100	22,100			22,100			
1972	100%	24,500		24,500				24,500	24,500			24,500			
1973	100%	28,000		28,000				28,000	27,907			27,907			93 ³
1974	100%	31,400		31,400				31,400	30,816			30,816			584 ³
1975	100%	35,000		35,000				35,000	35,000			35,000			
1976	100%	37,300		37,300				37,300	37,300			37,300			
1977	90%	40,800		36,720				36,720	23,695		5,000	28,695	8,025 ⁴	4,080 ²	
1978	100%	43,100		43,100			10,892	53,992	42,020			42,020			11,972 ³
1979	100%	45,400		45,400			48,524	93,924	93,924			93,924			
1980	100%	47,700		47,700	1,050		3,104	51,854	38,678			38,678			13,176 ³
1981	100%	50,200		50,200	1,250		30,545	81,995	71,995			71,995			10,000 ³
1982	100%	53,600		53,600	1,550		2,000	57,150	20,120			20,120			37,030 ³
1983	100%	56,000		56,000	1,850			57,850	3,427			3,427			54,423 ³
1984	100%	59,400		59,400	2,530		7,913	69,843	69,843			69,843			
1985	100%	62,900		62,900	2,795			65,695	65,695		1,100	66,795	2,908		
1986	100%	65,300		65,300	3,875		2,908	72,083	32,040	9,327	1,100	42,467			29,616 ³
1987	100%	68,800		68,800	3,950			72,750	71,030		1,100	72,130	620		
1988	100%	71,200	9,335	80,535	4,750		620	85,905	73,674		6,100 ⁴	79,774	6,131		
1989	100%	73,500	9,860	83,360	5,477		6,530 ⁴	95,367	77,367		18,000	95,367			
1990	100%	77,000	10,276	82,138	6,100	1,554		89,792	79,413			79,413	8,828 ⁶	5,138 ²	
1991	30%	77,000	10,276	23,100	5,600	1,554	635	30,889	24,851			24,851	2,500	64,176 ²	
1992	45%	77,000	10,276	39,274	5,400	1,554	2,500	48,728	44,992			44,992	(1,083) ⁷	48,002 ²	
1993	100%	77,000	10,276	87,276	5,310	1,554	39,189	133,329	109,879	21,896		131,775			
1994	53%	77,000	10,276	46,169	5,220	1,554		52,943	69,917	10,109		80,026	(2,195) ⁷	41,107 ²	
1995	100%	77,000	10,276	87,276	5,050		(2,195) ⁵	90,131	108,781	45,935		154,716	2,011		
1996	100%	77,000	10,276	87,276	11,100		2,011	100,387	120,324	52,266		172,590			
1997	100%	77,000	5,946	82,946	11,000			93,946	103,767	4,521		108,288			
1998	100%	77,000	5,946	82,946	10,800			93,746	79,474	27,688		107,162			7,700 ³
1999	100%	77,000	5,946	82,946	10,600			93,546	191,201	69		191,270			
2000	90%	77,000	5,946	74,651	14,352		47,122	136,125	121,774	7,792		129,566	10,471 ⁸	8,295 ²	
2001	39%	77,000	5,946	32,349	6,219		14,395	52,963	46,744	2,564		49,308		50,597 ²	
2002	70%	77,000	5,946	58,062	6,455		3,593	68,110	71,195	10,183		81,378		24,884 ²	
2003	90%	77,000	5,946	74,651	10,503		15,938	101,092	86,619	28,380		114,999	5,062	8,295 ²	
2004	65%	77,000	5,946	53,915	5,435		7,904	67,254	79,571	1,972		81,543		29,031 ²	
2005	90%	77,000	5,946	74,651	11,474		72,709	158,834	51,811	39,438		91,249	390	8,295 ²	
2006	100%	77,000	5,946	82,946	13,219		42,564	138,729	63,921	33,456		97,377	1,425		
2007	60%	77,000	5,946	49,768	4,080		8,280	62,128	63,552	2,623		66,175	(477) ⁷	33,178 ²	
2008	35%	77,000	5,946	29,031			136	29,167	29,167	-		29,167	1,190	53,915 ²	
2009	40%	77,000	5,946	33,178			1,236	34,414	21,716	-		21,716	12,698	49,768 ²	
2010	50%	77,000	5,946	41,473			12,974	54,447	43,753	645		44,398	8,182	41,473 ²	
2011	80%	77,000	5,946	66,357			25,057	91,414	58,378	29,360		87,738	211	16,589 ²	
2012	65%	77,000	5,946	53,915			1,727	55,642	55,183	-		55,183	2,301	29,031 ²	
2013	35%	77,000	5,946	29,031			10,314	39,345	47,202	-		47,202	(7,225) ⁷	53,915 ²	
2014	5%	77,000	5,946	4,147			(6,614)	(2,467)	-	-		-	2,993	78,799 ²	
2015	20%	77,000	5,946	16,589			3,507	20,096	1,500	-		1,500	11,904	66,357 ²	
2016	60%	77,000	5,946	49,768			13,136	62,904	13,411	-		13,411	6,426	33,178 ²	
2017	85%	77,000	5,946	70,504			13,749	84,253	16,186	6,358		22,544	10,805	12,442 ²	
2018	35%	77,000	5,946	29,031			16,921	45,952	4,613	-		4,613	5,915	53,915 ²	
2019	75%	77,000	5,946	62,210			22,454	84,664	36,075	7,103		43,178	8,820	20,737 ²	
2020	20%	77,000	5,946	16,589			12,708	29,297	9,172	-		9,172	1,455	66,357 ²	
2021	5%	77,000	5,946	4,147			3,548	7,695	-	-		-	9,280	78,799 ²	
2022	5%	77,000	5,946	4,147			9,280	13,427							
TOTALS		3,475,900	245,723	2,662,474	176,994	7,770	507,814	3,355,052	2,715,273	341,685	32,400	3,089,358	119,571	980,350	183,294

¹ CVC/ID4 project not completed.² Due to State Water Project shortfalls.³ Wet years on the Kern River.⁴ Includes 5,000 af released to water pool for use by agricultural districts.⁵ Carryover 6,131 af and 5,000 af Kern-Tulare/Lost Hills/ID4 exchange.⁶ Includes 635 af of carryover and 8,193 af released to water pool for use by agricultural district.⁷ Overdeliveries.⁸ Includes 10,000 af exchanged with Arvin-Edison; 47 af carryover.⁹ Replaced by interruptible water after execution of the Monterey Agreement in December 1994.

Table 6 - Groundwater Production*All units in acre-feet unless otherwise noted.*

Year	Agricultural	All Other	Total Production	Charges Collected
1976	20,000	78,200	98,200	\$1,321,000
1977	11,700	61,900	73,600	\$1,102,000
1978	14,500	55,500	70,000	\$1,119,000
1979	14,100	61,600	75,700	\$1,369,000
1980	11,900	63,000	74,900	\$1,190,000
1981	12,797	68,697	81,494	\$1,458,000
1982	7,655	63,140	70,795	\$1,575,700
1983	4,869	62,591	67,460	\$1,302,530
1984	9,755	73,052	82,807	\$1,564,580
1985	7,568	74,080	81,648	\$1,522,013
1986	2,726	74,386	77,112	\$1,516,070
1987	4,595	72,330	76,925	\$1,426,287
1988	4,555	67,500	72,055	\$1,384,849
1989	4,730	69,100	73,830	\$1,541,380
1990	5,000	71,000	76,000	\$1,546,222
1991	12,000	72,000	84,000	\$1,524,830
1992	4,454	81,230	85,684	\$1,621,910
1993	3,281	79,455	82,736	\$2,365,720
1994	5,743	87,009	92,752	\$1,582,433
1995	4,834	80,673	85,507	\$2,500,738
1996	3,889	89,226	93,115	\$2,736,595
1997	2,089	88,721	90,810	\$2,696,467
1998	988	76,492	77,480	\$2,315,939
1999	2,676	92,197	94,873	\$2,871,004
2000	1,569	92,182	93,751	\$2,797,852
2001	1,098	95,677	96,775	\$2,828,000
2002	360	99,821	100,181	\$2,961,831
2003	173	96,522	96,695	\$2,310,515
2004	157	93,290	93,447	\$2,799,629
2005	108	82,614	82,722	\$2,623,381
2006	380	76,120	76,500	\$2,800,000
2007	507	89,794	90,301	\$2,983,707
2008	466	94,034	94,500	\$3,065,002
2009	636	90,747	91,383	\$3,162,445
2010	398	78,027	78,425	\$3,103,644
2011	117	75,751	75,868	\$2,640,849
2012	63	77,271	77,334	\$2,720,115
2013	263	73,929	74,192	\$2,679,707
2014	1,661	82,270	83,931	\$3,042,016
2015	1,239	65,334	66,573	\$2,724,571
2016	337	61,570	61,908	\$2,240,097
2017	295	62,468	62,762	\$2,261,050
2018	423	61,046	61,469	\$2,332,976
2019	553	55,544	56,097	\$2,292,091
2020	860	58,674	59,534	\$2,124,075
2021	1,847	68,292	70,138	\$2,501,342
2022*	1,353	63,483	64,835	\$2,689,120
Total	191,268	3,557,539	3,748,805	\$102,838,283

* Estimated production values. Reported use not returned at time of publication.

Table 7 - Registered Active Wells Within ID4

Year	Commercial	Domestic	Irrigation	Purveyor	Total Active Wells
2013	106	83	11	221	421
2014	105	82	10	222	419
2015	105	82	10	222	419
2016	103	80	10	221	414
2017	99	81	10	221	411
2018	97	78	11	221	407
2019	93	75	11	219	398
2020	94	74	11	219	398
2021	95	74	11	216	396
2022	90	74	12	216	392

Table 8 - History of ID4 Groundwater Charges

Year	Agricultural Use	All Other Uses	Sm Groundwater Facilities
	<i>\$/acre-foot</i>	<i>\$/acre-foot</i>	<i>\$/year</i>
1975-1978	\$7.50	\$15.00	\$0.00
1978-1994	\$10.00	\$20.00	\$0.00
1994-2008	\$15.00	\$30.00	\$30.00
2008-2009	\$17.00	\$34.00	\$34.00
2009-2012	\$17.50	\$35.00	\$35.00
2012-2015	\$18.00	\$36.00	\$36.00
2015-2018	\$18.50	\$37.00	\$37.00
2018-2021	\$19.00	\$38.00	\$38.00
2021-2022	\$19.50	\$39.00	\$39.00

Table 9 - ID4 Land Use

Units in acres unless otherwise noted.

Year	M & I	Agricultural	Undeveloped	Total	Year	M & I	Agricultural	Undeveloped	Total
1972	24,200	19,500	21,700	65,400	2006	53,019	8,715	3,666	65,400
1974	30,700	18,400	16,300	65,400	2007	52,993	8,742	3,665	65,400
1976	30,600	18,500	16,300	65,400	2008	52,993	8,741	3,666	65,400
1978	33,500	18,000	13,900	65,400	2009	52,984	8,741	3,675	65,400
1980	36,700	16,500	12,200	65,400	2010	55,708	6,029	3,663	65,400
1982	38,600	14,700	12,100	65,400	2011	55,708	6,029	3,663	65,400
1984	40,000	12,000	13,400	65,400	2012	55,708	6,029	3,663	65,400
1986	42,000	10,800	12,600	65,400	2013	55,920	6,359	3,121	65,400
1988	42,270	10,821	12,309	65,400	2014	59,055	4,127	2,218	65,400
1990	49,364	8,558	7,478	65,400	2015	55,019	5,199	5,182	65,400
1991	49,424	12,493	3,483	65,400	2016	55,400	5,100	4,900	65,400
1992	49,759	11,641	4,000	65,400	2017	55,600	5,100	4,700	65,400
1993	50,456	11,102	3,842	65,400	2018	55,600	5,100	4,700	65,400
1994	51,418	10,214	3,768	65,400	2019	55,700	5,100	4,600	65,400
1995	51,472	11,533	2,395	65,400	2020	55,715	5,100	4,585	65,400
1996	52,775	9,431	3,194	65,400	2021	55,755	5,100	4,545	65,400
1997	53,146	8,816	3,438	65,400	2022	55,900	3,900	5,600	65,400
1998	51,503	7,951	5,946	65,400					
1999	52,558	7,228	5,614	65,400					
2000	53,457	6,592	5,351	65,400					
2001	54,145	6,204	5,051	65,400					
2002	52,907	8,787	3,706	65,400					
2003	52,907	8,787	3,706	65,400					
2004	52,907	8,788	3,705	65,400					
2005	53,019	8,722	3,659	65,400					

Table 10 - Henry C. Garnett Water Purification Plant Operations Costs 2022

	Purchased Chemicals	Labor	Energy	Miscellaneous Expenditures¹	Capital Outlays	Total	Deliveries	Unit Rate
	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(af)	(\$/af)
January	49,608	194,406	31,572	101,916	8,216	385,718	2,079	186
February	71,564	196,963	-	133,687	16,846	419,060	2,237	187
March	85,641	204,211	34,102	127,955	6,592	458,501	2,322	197
April	19,318	186,493	69,960	90,973	1,950	368,694	2,423	152
May	109,509	186,915	36,069	125,332	12,493	470,318	3,256	144
June	270,588	363,373	109,607	523,541	51,459	1,318,568	3,851	342
July	157,064	290,899	15,454	149,288	-	612,705	4,503	136
August	189,993	216,420	88,822	100,182	-	595,417	4,037	147
September	242,674	211,446	87,750	148,169	5,198	695,237	3,888	179
October	141,076	201,624	78,501	156,827	9,917	587,945	3,093	190
November	109,285	184,669	52,908	128,486	3,619	478,967	2,131	225
December	70,680	307,707	51,502	195,563	509	625,961	2,212	283
Totals	1,517,000	2,745,126	656,247	1,981,919	116,799	7,017,091	36,032	195

Table 10A - Henry C. Garnett Water Purification Plant Historic Annual Operations Costs

	Purchased Chemicals	Labor	Energy	Miscellaneous Expenditures¹	Capital Outlays	Total	Deliveries	Unit Rate
	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(af)	(\$/af)
2013	571,682	2,648,915	368,357	1,090,748	1,041,009	5,720,711	36,294	157
2014	438,238	2,735,526	463,511	1,193,138	468,392	5,298,805	31,332	176
2015	403,424	2,769,409	275,214	1,606,540	121,114	5,175,701	27,877	186
2016	647,088	2,614,321	305,148	1,393,931	48,165	5,008,653	32,364	155
2017	912,336	2,636,823	317,412	1,448,409	85,733	5,400,713	37,993	142
2018	960,812	2,884,463	326,469	1,794,815	251,590	6,218,149	36,752	169
2019	1,051,166	2,589,461	368,039	1,706,382	192,483	5,907,531	38,215	155
2020	840,715	2,442,894	539,972	1,711,079	35,177	5,569,837	39,823	140
2021	905,968	2,555,994	515,649	1,621,925	200,572	5,800,108	34,377	169
2022	1,517,000	2,745,126	656,247	1,981,919	116,799	7,017,091	36,032	195
Totals	2,972,768	13,404,994	1,729,642	6,732,766	1,764,413	26,604,583	165,860	

¹ Includes: operations (less chemicals), maintenance, office supplies, memberships, professional services, licenses & permits, insurance premiums, debt service on ID4 capital assets, Agency overhead charges and other expenses.

Table 11 - ID4 - Operations Fund

	Actual	Actual	Final	Estimated	Proposed
	2019-2020	2020-21	Budget	Actual	Budget
Revenues			2021-22	2021-22	2022-23
4150 Treated Water Sales	8,587,856	8,927,638	8,878,400	8,916,800	8,914,200
4170 Other Water Sales	125,924	314,966		6,000,000	100,000
Water Sales Total	8,713,780	9,242,604	8,878,400	14,916,800	9,014,200
4290 Refunds & Credits	-	6,896	-	-	-
Credits & Refunds Total	-	6,896	-	-	-
4400 Participant's Annual Payments	196,237	98,118	196,240	196,240	196,240
4401 Participant's O&M Costs	921,972	1,214,425	2,012,540	2,012,540	2,361,960
4402 Participant's Power Costs	3,785,783	4,095,927	3,835,310	4,264,190	4,546,190
4430 Exchange/Conveyance Fees	355,310	616,500	556,000	479,000	180,600
4499 Other User Charges	512,093	1,123,607	805,600	1,490,000	977,500
User Charges Total	5,771,395	7,148,577	7,405,690	8,441,970	8,262,490
4500 Groundwater Charge Collection	2,118,499	2,496,766	2,230,000	2,600,000	2,535,000
Ground Water Charges Total	2,118,499	2,496,766	2,230,000	2,600,000	2,535,000
4610 Reimbursables	88,301	674,535	750,000	420,000	4,936,800
Reimbursements Total	88,301	674,535	750,000	420,000	4,936,800
4700 Investment Income	105,445	47,165	60,000	40,000	40,000
4705 Interest From Other Sources	-	-	-	-	-
Interest Income Total	105,445	47,165	60,000	40,000	40,000
4800 Proceeds from Debt Issuance	-	-	-	-	-
Proceeds From Debt Insurance Total	-	-	-	-	-
4900 Other Revenue	245	13,464	744,000	10,900	1,220,200
4901 Disposal of Fixed Assets	296				
4902 Lease Income	-				
4911 Water Analyses	10,855	32,420	20,000	20,000	20,000
Other Revenue Total	11,396	45,884	764,000	30,900	1,240,200
Total Revenues	16,808,816	19,662,427	20,088,090	26,449,670	26,028,690

Table 11 - ID4 - Operations Fund - continued

	Actual 2019-2020	Actual 2020-21	Final Budget 2021-22	Estimated Actual 2021-22	Proposed Budget 2022-23
Expenditures					
5000 Salaries Regular	1,979,596	2,027,524	2,440,360	2,208,200	2,778,570
5001 Salaries Overtime	84,013	44,986	56,050	53,700	52,000
5002 Salaries Temporary	14,881	724	-	-	-
5010 Benefits Social Security	147,366	146,673	191,750	174,380	218,010
5011 Workers Compensation Insurance	24,841	27,876	76,720	41,360	54,000
5012 Benefits Unemployment Insurance	-	7,842	-	-	-
5020 Benefits Retirement	919,262	944,293	1,259,210	1,186,500	1,478,310
5021 Benefits Health Insurance	825,133	840,711	952,620	896,300	907,500
5022 Benefits Life Insurance	15,026	15,528	21,480	16,400	23,400
5023 Benefits Dental Insurance	17,518	16,360	28,200	18,070	28,080
5024 Benefits Vision Insurance	4,931	4,841	6,600	5,220	6,360
5025 Benefits LTD Insurance	14,784	15,102	25,560	22,080	26,880
5026 Benefits LTC Insurance	2,192	2,569	8,040	2,690	5,880
Labor Costs Total	4,049,543	4,095,029	5,066,590	4,624,900	5,578,990
5250 Member Unit Credits	-	-	-	-	-
Member Unit Credit Total	-	-	-	-	-
5100 Groundwater Recharge Fees	165,396	197,791	183,000	150,000	355,600
5101 Groundwater Extraction Fees	701,192	1,922,509	2,033,700	3,200,000	1,775,600
5103 Water Exchange & Convey. Fees	382,675	128,296	80,000	110,000	80,000
5115 Reregulation Fees	-	-	-	-	-
5130 CVC O&M Costs	1,621,361	1,513,618	1,723,620	1,450,000	2,137,560
5131 CVC Power & Standby Charges	1,070,732	406,064	500,000	200,000	500,000
5170 Other Water Purchases	2,980	-	-	-	-
Water Purchases & Fees Total	3,944,336	4,168,278	4,520,320	5,110,000	4,848,760
5260 Fuels, Oils and Grease	38,624	34,685	37,200	45,450	47,000
5270 Chemicals	1,061,961	992,876	1,050,000	900,000	1,450,000
5280 Water Analyses	124,319	116,203	95,000	125,000	125,000
5290 Rents and Leases	6,569	2,797	7,500	4,000	4,000
5299 Other Operating Supplies	2,491	3,645	4,000	4,000	4,500
Operations Total	1,233,964	1,150,206	1,193,700	1,078,450	1,630,500
5300 Power for Operations	4,186,997	5,423,882	5,243,000	6,950,000	5,726,700
5301 Standby Charges for Power	16,692	(40,353)	12,500	56,500	14,300
Power Total	4,203,689	5,383,529	5,255,500	7,006,500	5,741,000
5400 Maint - Structures & Improvmnts	273,648	138,647	446,000	447,500	297,500
5401 Maint - Mobile Equip	28,855	32,096	19,600	21,750	21,750
5402 Maint - Electronic Equip	104,114	303,111	130,200	109,800	112,300
5403 Maint - Wells, Pumps, Motors	163,847	155,432	184,500	447,500	342,500
5404 Maint - Chemicals	1,093	604	-	-	-
5408 Maint - Office Equip & Furnish	648	529	500	500	500
5409 Maint - Other	35,156	26,090	15,600	23,000	23,500
5410 Maint - Janitorial	23,747	23,900	25,000	25,000	25,000
Maintenance Total	631,108	680,409	821,400	1,075,050	823,050

Table 11 - ID4 - Operations Fund - continued

	Actual 2019-2020	Actual 2020-21	Final Budget 2021-22	Estimated Actual 2021-22	Proposed Budget 2022-23
Expenditures - continued					
5500 General Office Supplies	2,304	6,541	4,850	10,760	4,860
5501 Printing and Reproduction	553	58	100	50	100
5502 Computer Supplies	2,913	1,010	2,250	1,450	1,750
5503 Publications & Subscriptions	7,206	6,420	6,230	8,900	8,400
5504 Mailing Services	3,025	2,326	1,600	600	1,100
5510 Laundry and Uniforms	17,051	9,231	15,600	11,350	11,300
5520 Legal Notices & Job Advertise.	3,716	1,111	600	500	500
5530 Computer Access Fees	5,582	8,740	10,350	9,800	9,850
5540 Promotions & Advertisements	1,238	2,759	-	1,000	1,000
5550 Assoc. & Prof. Membership Fees	193,508	109,290	183,850	133,850	183,850
5570 Telephone	23,910	30,290	23,050	30,900	30,900
5571 Utilities	5,607	6,524	5,500	6,500	6,500
5581 Liability Insurance	64,770	29,279	75,300	45,100	85,700
5582 Property Insurance	63,263	49,627	61,469	71,760	72,200
5589 Safety Programs & Equipment	20,003	20,910	21,200	28,600	23,850
5590 Directors' Fees	12,298	12,666	12,000	17,500	17,500
5591 Business Meetings & Travel	8,795	238	15,250	12,360	15,250
5592 Education & Training	1,410	11,769	10,000	3,000	10,000
5593 Employee Recruitment	5,175	3,557	-	-	-
5599 Agency Overhead Allocation	985,969	966,954	1,035,300	1,035,300	1,015,400
Administration Total	1,428,296	1,279,300	1,484,499	1,429,280	1,500,010
5601 Legal Services	12,843	867	10,000	7,000	10,000
5602 Consulting Engineers	64,823	439,459	1,069,250	564,410	1,011,000
5603 Audit Services	10,200	10,356	15,600	13,350	15,600
5604 Special Consultants	154,778	173,870	271,400	301,000	669,150
Professional Services Total	242,644	624,552	1,366,250	885,760	1,705,750
5710 Land Purchase	-	-	-	-	-
5720 Structures & Improvements	955,342	710,338	866,600	800,000	975,000
5730 Mobile Equipment	32,906	48,548	-	-	80,000
5740 Electrical & Mechanical Equip	71,886	21,346	158,000	158,000	180,500
5790 Other Equipment	-	-	-	-	-
Capital Outlays Total	1,060,134	780,232	1,024,600	958,000	1,235,500
5800 Principal on Long Term Debt	138,319	141,514	144,900	144,900	148,400
5801 Interest on Long Term Debt	39,955	36,753	33,500	33,500	30,000
Debt Repayment Total	178,274	178,267	178,400	178,400	178,400
5910 Tax Collection Charge	-	-	-	-	-
5920 Amort. / Deprec. Expense	-	-	-	-	-
5950 Licenses & Permits	45,901	49,913	50,000	55,000	55,500
5951 Prof. License & Certification Fees	935	911	1,650	1,650	1,650
5960 Security	77,554	84,214	80,000	80,500	81,000
5970 Special Projects	-	-	-	-	5,060,000
5999 Other Expenses	36,811	21,920	35,800	36,300	40,150
Other Expenses Total	161,201	156,958	167,450	173,450	5,238,300
5900 Unapplied Appropriations	-	-	-	-	-
Unapplied Appropriations Total	-	-	-	-	-
Total Expenditures	17,133,189	18,496,760	21,078,709	22,519,790	28,480,260

Table 12 - Treated Water 2022

Constituent	Maximum Contaminant Level			Parameter			Months in Compliance	
Microbiological								
Coliform Bacteria	> 5.0% of samples present for coliform bacteria in one month			40 or more samples collected per month			12	
Constituent	Units	PHG	MCL	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Average
Primary Inorganic Chemicals								
Aluminum	mg/L	0.6	1	ND	0.064	0.120	0.084	0.067
Antimony	mg/L	0.001	0.006	ND	ND	ND	ND	ND
Arsenic	mg/L	0.000004	0.010	ND	ND	0.002	0.003	0.001
Asbestos	MFL	7	7	-	ND	-	-	N/A
Barium	mg/L	2	1	ND	ND	ND	ND	ND
Beryllium	mg/L	0.001	0.004	ND	ND	ND	ND	ND
Cadmium	mg/L	0.00004	0.005	ND	ND	ND	ND	ND
Chromium, Total	mg/L	N/A	0.05	ND	ND	ND	ND	ND
Chromium, Hexavalent	mg/L	0.00002	N/A	-	0.00005	-	-	N/A
Cyanide	mg/L	0.15	0.15	-	ND	-	-	N/A
Fluoride	mg/L	1	2	0.30	0.24	0.28	0.27	0.27
Lead*	mg/L	0.0002	0.015	ND	ND	ND	ND	ND
Mercury	mg/L	0.0012	0.002	ND	ND	ND	ND	ND
Nickel	mg/L	0.012	0.1	ND	ND	ND	ND	ND
Nitrate (as Nitrogen, N)	mg/L	10	10	ND	ND	0.10	ND	0.03
Nitrite (as Nitrogen, N)	mg/L	1	1	ND	ND	ND	ND	ND
Nitrite + Nitrate (sum as Nitrogen, N)	mg/L	10	10	ND	ND	0.10	ND	0.03
Perchlorate	mg/L	0.001	0.006	-	-	ND	-	N/A
Selenium	mg/L	0.03	0.05	ND	ND	ND	ND	ND
Thallium	mg/L	0.0001	0.002	ND	ND	ND	ND	ND
Secondary Standards								
Aluminum	mg/L	N/A	0.2	ND	0.064	0.120	0.084	0.067
Color	Units	N/A	15	2.5	< 2.5	< 2.5	< 2.5	< 2.5
Copper*	mg/L	0.3	1.3	ND	ND	ND	ND	ND
Foaming Agents (MBAS)	mg/L	N/A	0.5	-	ND	-	-	N/A
Iron	mg/L	N/A	0.3	ND	ND	ND	ND	ND
Manganese	mg/L	N/A	0.05	ND	ND	ND	ND	ND
Methyl tert-butyl ether	mg/L	N/A	0.005	ND	ND	ND	ND	ND
Odor	Units	N/A	3	1.4	1.4	1.4	2.0	1.6
Silver	mg/L	N/A	0.1	ND	ND	ND	ND	ND
Thiobencarb	mg/L	N/A	0.001	-	ND	-	-	N/A
Turbidity	NTU	N/A	5	0.05	0.04	0.07	0.06	0.06
Zinc	mg/L	N/A	5.0	0.051	ND	ND	0.056	0.027
Total Dissolved Solids	mg/L	N/A	1000	182	135	115	158	148
Specific Conductance	uS/cm	N/A	1600	326	245	213	270	264
Chloride	mg/L	N/A	500	14.7	11.0	10.4	12.6	12.2
Sulfate	mg/L	N/A	500	55.8	41.2	32.4	42.9	43.1
General Minerals								
Total Alkalinity (as CaCO ₃)	mg/L	N/A	N/A	78	60	54	68	65
Bicarbonate	mg/L	N/A	N/A	95.2	73.2	65.9	83.0	79.3
Carbonate	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Hydroxide	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Total Hardness (as CaCO ₃)	mg/L	N/A	N/A	90.9	53.7	47.0	75.0	66.7
Calcium	mg/L	N/A	N/A	28.2	16.3	14.7	23.6	20.7
Magnesium	mg/L	N/A	N/A	5.00	3.12	2.50	3.90	3.63
Sodium	mg/L	N/A	N/A	32.3	24.6	26.2	27.8	27.7
Potassium	mg/L	N/A	N/A	2.85	2.28	2.13	2.57	2.46
pH	Units	N/A	N/A	7.30	7.21	7.29	7.15	7.24
Additional Analyses								
Ammonia	mg/L	N/A	N/A	ND	ND	ND	ND	ND
Boron**	mg/L	N/A	1	-	0.18	-	-	N/A
Bromide	mg/L	N/A	N/A	ND	ND	ND	0.01	ND
Chlorate**	mg/L	N/A	0.8	0.264	0.223	0.269	0.386	0.286
Chlorite	mg/L	0.05	1.0	ND	ND	ND	ND	ND
Phosphate as PO ₄	mg/L	N/A	N/A	ND	0.36	0.40	ND	0.19
Silica	mg/L	N/A	N/A	7.43	7.0	6.27	10.7	7.85
Total Organic Carbon	mg/L	N/A	N/A	1.7	1.5	1.5	1.9	1.7
Vanadium***	mg/L	N/A	0.05	-	ND	-	-	N/A
Radioactivity								
Gross Alpha	pCi/L	N/A	15	-	2.11	-	-	N/A

*Values identified as MCLs are Action Levels under the lead and copper rule

**Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 12 - Treated Water 2022

Constituent	Units	PHG	MCL	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Average
Regulated Organic Chemicals								
Total Trihalomethanes	mg/L	N/A	0.080	Refer to Attachment 1				
Haloacetic Acids (HAA5)	mg/L	N/A	0.060	Refer to Attachment 1				
Benzene	mg/L	0.00015	0.001	ND	ND	ND	ND	ND
Carbon Tetrachloride	mg/L	0.0001	0.0005	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	mg/L	0.6	0.6	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/L	0.006	0.005	ND	ND	ND	ND	ND
1,1-Dichloroethane	mg/L	0.003	0.005	ND	ND	ND	ND	ND
1,2-Dichloroethane	mg/L	0.0004	0.0005	ND	ND	ND	ND	ND
1,1-Dichloroethylene	mg/L	0.01	0.006	ND	ND	ND	ND	ND
cis-1,2-Dichloroethylene	mg/L	0.013	0.006	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	mg/L	0.05	0.01	ND	ND	ND	ND	ND
Dichloromethane	mg/L	0.004	0.005	ND	ND	ND	ND	ND
1,2-Dichloropropane	mg/L	0.0005	0.005	ND	ND	ND	ND	ND
1,3-Dichloropropane	mg/L	0.0002	0.0005	ND	ND	ND	ND	ND
Ethylbenzene	mg/L	0.3	0.3	ND	ND	ND	ND	ND
Methyl tert-butyl ether	mg/L	0.013	0.013	ND	ND	ND	ND	ND
Monochlorobenzene	mg/L	0.07	0.07	ND	ND	ND	ND	ND
Styrene	mg/L	0.0005	0.1	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	mg/L	0.0001	0.001	ND	ND	ND	ND	ND
Tetrachloroethylene	mg/L	0.00006	0.005	ND	ND	ND	ND	ND
Toluene	mg/L	0.15	0.15	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	mg/L	0.005	0.005	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	mg/L	1	0.200	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	mg/L	0.0003	0.005	ND	ND	ND	ND	ND
Trichloroethylene	mg/L	0.0017	0.005	ND	ND	ND	ND	ND
Trichlorofluoromethane	mg/L	1.3	0.15	ND	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	4	1.2	ND	ND	ND	ND	ND
Vinyl Chloride	mg/L	0.00005	0.0005	ND	ND	ND	ND	ND
Xylenes (total)	mg/L	1.8	1.750	ND	ND	ND	ND	ND
Regulated Non-Volatile Synthetic Organic Chemicals								
Alachlor	mg/L	0.004	0.002	-	ND	-	-	N/A
Atrazine	mg/L	0.00015	0.001	-	ND	-	-	N/A
Bentazon	mg/L	0.2	0.018	-	ND	-	-	N/A
Benzo(a)pyrene	mg/L	0.000007	0.0002	-	ND	-	-	N/A
Carbofuran	mg/L	0.0007	0.018	-	ND	-	-	N/A
Chlordane	mg/L	0.00003	0.0001	-	ND	-	-	N/A
Dalapon	mg/L	0.79	0.2	-	ND	-	-	N/A
1,2-Dibromo-3-chloropropane	mg/L	0.000003	0.0002	ND	ND	ND	ND	ND
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.02	0.07	-	ND	-	-	N/A
Di(2-ethylhexyl)adipate	mg/L	0.2	0.4	-	ND	-	-	N/A
Di(2-ethylhexyl)phthalate	mg/L	0.012	0.004	-	ND	-	-	N/A
Dinoseb	mg/L	0.014	0.007	-	ND	-	-	N/A
Diquat	mg/L	0.006	0.02	-	ND	-	-	N/A
Endothall	mg/L	0.094	0.1	-	ND	-	-	N/A
Endrin	mg/L	0.0003	0.002	-	ND	-	-	N/A
Ethylene Dibromide	mg/L	0.00001	0.00005	ND	ND	ND	ND	ND
Glyphosate	mg/L	0.9	0.7	-	ND	-	-	N/A
Heptachlor	mg/L	0.000008	0.00001	-	ND	-	-	N/A
Heptachlor Epoxide	mg/L	0.000006	0.00001	-	ND	-	-	N/A
Hexachlorobenzene	mg/L	0.00003	0.001	-	ND	-	-	N/A
Hexachlorocyclopentadiene	mg/L	0.002	0.05	-	ND	-	-	N/A
Lindane	mg/L	0.000032	0.0002	-	ND	-	-	N/A
Methoxychlor	mg/L	0.00009	0.03	-	ND	-	-	N/A
Molinate	mg/L	0.001	0.02	-	ND	-	-	N/A
Oxamyl	mg/L	0.026	0.05	-	ND	-	-	N/A
Pentachlorophenol	mg/L	0.0003	0.001	-	ND	-	-	N/A
Picloram	mg/L	0.166	0.5	-	ND	-	-	N/A
Polychlorinated Biphenyls	mg/L	0.00009	0.0005	-	ND	-	-	N/A
Simazine	mg/L	0.004	0.004	-	ND	-	-	N/A
Thiobencarb	mg/L	0.042	0.07	-	ND	-	-	N/A
Toxaphene	mg/L	0.00003	0.003	-	ND	-	-	N/A
1,2,3-Trichloropropane	mg/L	0.0000007	0.000005	-	-	ND	-	N/A
2,3,7,8-TCDD (Dioxin)	mg/L	0.00000000005	0.00000003	-	waived	-	-	N/A
2,4,5-TP (Silvex)	mg/L	0.003	0.05	-	ND	-	-	N/A

*Values identified as MCLs are Action Levels under the lead and copper rule

**Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 12 - Treated Water 2022

Constituent	Units	PHG	MCL	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Average
Unregulated Organic Chemicals								
tert-Amyl methyl ether	mg/L	N/A	N/A	ND	ND	ND	-	ND
Bromobenzene	mg/L	N/A	N/A	ND	ND	ND	-	ND
Bromochloromethane	mg/L	N/A	N/A	ND	ND	ND	-	ND
Bromomethane	mg/L	N/A	N/A	ND	ND	ND	-	ND
Tertiary butyl alcohol**	mg/L	N/A	0.012	ND	ND	ND	-	ND
n-Butylbenzene**	mg/L	N/A	0.26	ND	ND	ND	-	ND
sec-Butylbenzene**	mg/L	N/A	0.26	ND	ND	ND	-	ND
tert-Butylbenzene**	mg/L	N/A	0.26	ND	ND	ND	-	ND
Chloroethane	mg/L	N/A	N/A	ND	ND	ND	-	ND
Chloromethane	mg/L	N/A	N/A	ND	ND	ND	-	ND
2-Chlorotoluene**	mg/L	N/A	0.14	ND	ND	ND	-	ND
4-Chlorotoluene**	mg/L	N/A	0.14	ND	ND	ND	-	ND
Dibromomethane	mg/L	N/A	N/A	ND	ND	ND	-	ND
1,3-Dichlorobenzene**	mg/L	N/A	0.6	ND	ND	ND	-	ND
Dichlorodifluoromethane**	mg/L	N/A	1	ND	ND	ND	-	ND
1,3-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	-	ND
2,2-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	-	ND
1,1-Dichloropropene	mg/L	N/A	N/A	ND	ND	ND	-	ND
Diisopropyl ether	mg/L	N/A	N/A	ND	ND	ND	-	ND
Ethyl tert-butyl ether	mg/L	N/A	N/A	ND	ND	ND	-	ND
Hexachlorobutadiene	mg/L	N/A	N/A	ND	ND	ND	-	ND
Isopropylbenzene**	mg/L	N/A	0.77	ND	ND	ND	-	ND
p-Isopropyltoluene	mg/L	N/A	N/A	ND	ND	ND	-	ND
Naphthalene**	mg/L	N/A	0.017	ND	ND	ND	-	ND
Nitrobenzene	mg/L	N/A	N/A	ND	ND	-	-	ND
Pentachloroethane	mg/L	N/A	N/A	ND	ND	-	-	ND
n-Propylbenzene**	mg/L	N/A	0.26	ND	ND	ND	-	ND
1,1,1,2-Tetrachloroethane	mg/L	N/A	N/A	ND	ND	ND	-	ND
1,2,3-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	ND	-	ND
1,3,5-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	-	-	ND
1,2,3-Trimethylbenzene	mg/L	N/A	N/A	ND	ND	-	-	ND
1,2,4-Trimethylbenzene**	mg/L	N/A	0.33	ND	ND	ND	-	ND
1,3,5-Trimethylbenzene**	mg/L	N/A	0.33	ND	ND	ND	-	ND
Methyl isobutyl ketone**	mg/L	N/A	0.12	ND	ND	ND	-	ND
Unregulated Non-Volatile Synthetic Organic Chemicals								
Aldicarb**	mg/L	N/A	0.007	-	ND	-	-	N/A
Aldicarb Sulfone	mg/L	N/A	N/A	-	ND	-	-	N/A
Aldicarb Sulfoxide	mg/L	N/A	N/A	-	ND	-	-	N/A
Aldrin**	mg/L	N/A	0.000002	-	ND	-	-	N/A
Bromacil	mg/L	N/A	N/A	-	ND	-	-	N/A
Butachlor	mg/L	N/A	N/A	-	ND	-	-	N/A
Carbaryl**	mg/L	N/A	0.7	-	ND	-	-	N/A
Diazinon**	mg/L	N/A	0.0012	-	ND	-	-	N/A
Dicamba	mg/L	N/A	N/A	-	ND	-	-	N/A
Dieldrin**	mg/L	N/A	0.000002	-	ND	-	-	N/A
Dimethoate**	mg/L	N/A	0.001	-	ND	-	-	N/A
Diuron	mg/L	N/A	N/A	-	ND	-	-	N/A
3-Hydroxycarbofuran	mg/L	N/A	N/A	-	ND	-	-	N/A
Methomyl	mg/L	N/A	N/A	-	ND	-	-	N/A
Metolachlor	mg/L	N/A	N/A	-	ND	-	-	N/A
Metribuzin	mg/L	N/A	N/A	-	ND	-	-	N/A
Propachlor**	mg/L	N/A	0.09	-	ND	-	-	N/A
2,4,5-T	mg/L	N/A	N/A	-	ND	-	-	N/A

*Values identified as MCLs are Action Levels under the lead and copper rule

**Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 12 - Treated Water 2022

Total Trihalomethanes Monitoring 2022 (State Stage 2 D/DBPR)

Total Trihalomethanes MCL	0.080 ppm				
MCL in CCR units	80 ppb				
Location	2022 TTHM Results (ppb)				
	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	LRAA
Site 1: 1022 Sequoia Street	15.0	52.9	36.0	22.6	31.6
Site 2: Francis Street Alley	15.9	41.9	36.6	32.4	31.7
Site 3: NOR Terminal Tank Inlet	15.6	52.7	37.5	33.2	34.8
Site 4: North King & Jeffrey	22.3	56.2	26.2	24.8	32.4
Site 5: Wenatchee Pump Station	21.2	50.0	26.8	20.7	29.7
Site 6: Oswell Large Tank	22.6	91.4	40.2	32.4	46.7
Site 7: Oswell Pump Station	21.8	52.9	28.8	22.7	31.6
Site 8: Seven Seas	20.5	57.3	30.4	22.8	32.8
Site 9: Meany & Alken	20.5	60.0	31.0	23.3	33.7
Site 10: Meany & Coffee	19.8	58.2	30.9	29.5	34.6

CCR Table Excerpt

Contaminant (CCR units)	MCL	PHG (or MCLG)	Highest LRAA	Range	Sample Date	Violation	Typical Source
TTHM (ppb)	80	N/A	46.7	15.0 - 91.4	2022	No	Byproduct of drinking water disinfection

Haloacetic Acids Monitoring 2022 (State Stage 2 D/DBPR)

Haloacetic Acids MCL	0.060 ppm				
MCL in CCR units	60 ppb				
Location	2022 HAA5 Results (ppb)				
	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	LRAA
Site 1: 1022 Sequoia Street	8.9	43.3	32.1	22	26.6
Site 2: Francis Street Alley	9.2	28.5	41.5	25	26.1
Site 3: NOR Terminal Tank Inlet	7.9	45.5	35.2	26	28.7
Site 4: North King & Jeffrey	9.4	42.4	32.2	21	26.3
Site 5: Wenatchee Pump Station	11.0	46.1	26.0	19	25.5
Site 6: Oswell Large Tank	7.0	59.2	43.0	26	33.8
Site 7: Oswell Pump Station	10.7	44.2	22.7	21	24.7
Site 8: Seven Seas	9.8	40.8	29.9	22	25.6
Site 9: Meany & Alken	10.4	47.0	36.1	22	28.9
Site 10: Meany & Coffee	9.4	47.2	27.2	24	27.0

CCR Table Excerpt

Contaminant (CCR units)	MCL	PHG (or MCLG)	Highest LRAA	Range	Sample Date	Violation	Typical Source
HAA5 (ppb)	60	N/A	33.8	7.0 - 59.2	2022	No	Byproduct of drinking water disinfection

CCR = Consumer Confidence Report

LRAA = Locational Running Annual Average

MCL = Maximum Contaminant Level

MCLG = Maximum Contaminant Level Goal

N/A = Not Applicable

PHG = Public Health Goal

ppb = parts per billion

ppm = parts per million

Table 13 - Source Water 2022

Constituent	Units	PHG*	MCL*	Source			
				Friant Kern	Groundwater	Aqueduct	Kern River
Primary Inorganic Chemicals							
Aluminum	mg/L	0.6	1	0.055	ND	ND	ND
Antimony	mg/L	0.001	0.006	ND	ND	ND	ND
Arsenic	mg/L	0.000004	0.010	ND	0.003	0.005	0.006
Asbestos	MFL	7	7	ND	ND	ND	ND
Barium	mg/L	2	1	ND	ND	ND	ND
Beryllium	mg/L	0.001	0.004	ND	ND	ND	ND
Cadmium	mg/L	0.00004	0.005	ND	ND	ND	ND
Chromium, Total	mg/L	N/A	0.05	ND	ND	ND	ND
Chromium, Hexavalent	mg/L	0.00002	N/A	0.0003	0.0002	0.0009	ND
Cyanide	mg/L	0.15	0.15	ND	ND	ND	ND
Fluoride	mg/L	1	2	ND	0.13	0.25	0.27
Lead**	mg/L	0.0002	0.015	ND	ND	ND	ND
Mercury	mg/L	0.0012	0.002	ND	ND	ND	ND
Nickel	mg/L	0.012	0.1	ND	ND	ND	ND
Nitrate (as N)	mg/L	10	10	0.31	0.60	1.00	ND
Nitrite (as Nitrogen, N)	mg/L	1	1	ND	ND	ND	ND
Nitrate + Nitrite (sum as Nitrogen, N)	mg/L	10	10	0.31	0.60	1.00	ND
Perchlorate	mg/L	0.001	0.006	ND	ND	ND	ND
Selenium	mg/L	0.03	0.05	ND	ND	ND	ND
Thallium	mg/L	0.0001	0.002	ND	ND	ND	ND
Secondary Standards							
Aluminum	mg/L	N/A	0.2	0.055	ND	ND	ND
Color	Units	N/A	15	5.0	5.0	2.5	10
Copper**	mg/L	0.3	1.3	0.107	ND	ND	ND
Foaming Agents (MBAS)	mg/L	N/A	0.5	ND	ND	ND	ND
Iron	mg/L	N/A	0.3	ND	ND	0.128	0.120
Manganese	mg/L	N/A	0.05	ND	ND	ND	0.233
Methyl tert-butyl ether	mg/L	N/A	0.005	ND	ND	ND	ND
Odor	Units	N/A	3	6	4	6	6
Silver	mg/L	N/A	0.1	ND	ND	ND	ND
Thiobencarb	mg/L	N/A	0.001	ND	ND	ND	ND
Turbidity	Units	N/A	5	1.31	1.31	0.81	1.78
Zinc	mg/L	N/A	5.0	ND	ND	ND	ND
Total Dissolved Solids	mg/L	N/A	1000	73	143	468	118
Specific Conductance	uS/cm	N/A	1600	133	251	833	213
Chloride	mg/L	N/A	500	6.61	19.9	156	7.34
Sulfate	mg/L	N/A	500	7.67	18.1	108	20.1
General Minerals							
Total Alkalinity (as CaCO ₃)	mg/L	N/A	N/A	82	73	32	76
Bicarbonate	mg/L	N/A	N/A	56.1	89.1	39.0	92.7
Carbonate	mg/L	N/A	N/A	28.8	ND	ND	ND
Hydroxide	mg/L	N/A	N/A	ND	ND	ND	ND
Total Hardness (as CaCO ₃)	mg/L	N/A	N/A	41.2	69.5	105	58.2
Calcium	mg/L	N/A	N/A	14.6	24.2	37.9	18.0
Magnesium	mg/L	N/A	N/A	1.15	2.22	2.62	3.23
Sodium	mg/L	N/A	N/A	11.8	24.7	151	23.4
Potassium	mg/L	N/A	N/A	1.48	2.01	1.37	2.40
pH	Units	N/A	N/A	9.00	8.43	7.79	8.30
Additional Analyses							
Ammonia	mg/L	N/A	N/A	0.04	0.28	0.21	ND
Boron***	mg/L	N/A	1	ND	0.13	0.13	0.18
Bromide	mg/L	N/A	N/A	0.02	0.07	0.61	0.02
Phosphate	mg/L	N/A	N/A	ND	ND	ND	ND
Silica	mg/L	N/A	N/A	15.4	15	11	7.8
Total Organic Carbon	mg/L	N/A	N/A	2.3	1.3	1.6	2.8
Vanadium***	mg/L	N/A	0.05	0.004	0.004	0.009	ND
Radioactivity							
Gross Alpha	pCi/L	N/A	15	ND	2.88	2.72	4.74
Gross Beta	mrem/yr	N/A	4	-	-	-	-
Radium 226	pCi/L	0.05	N/A	-	-	-	-
Radium 228	pCi/L	0.019	N/A	-	-	-	-
Radium 226 + Radium 228	pCi/L	N/A	5	-	-	-	-
Strontium-90	pCi/L	0.35	8	-	-	-	-
Tritium	pCi/L	400	20,000	-	-	-	-
Uranium	pCi/L	0.43	20	-	-	-	-

*Applicable to treated water only

**Values identified as MCLs are Action Levels under the lead and copper rule

***Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

mrem/yr = millirems per year

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 13 - Source Water 2022

Constituent	Units	PHG*	MCL*	Source			
				Friant Kern	Groundwater	Aqueduct	Kern River
Regulated Volatile Organic Chemicals							
Benzene	mg/L	0.00015	0.001	ND	ND	ND	ND
Carbon Tetrachloride	mg/L	0.0001	0.0005	ND	ND	ND	ND
1,2-Dichlorobenzene	mg/L	0.6	0.6	ND	ND	ND	ND
1,4-Dichlorobenzene	mg/L	0.006	0.005	ND	ND	ND	ND
1,1-Dichloroethane	mg/L	0.003	0.005	ND	ND	ND	ND
1,2-Dichloroethane	mg/L	0.0004	0.0005	ND	ND	ND	ND
1,1-Dichloroethylene	mg/L	0.01	0.006	ND	ND	ND	ND
cis-1,2-Dichloroethylene	mg/L	0.013	0.006	ND	ND	ND	ND
trans-1,2-Dichloroethylene	mg/L	0.05	0.01	ND	ND	ND	ND
Dichloromethane	mg/L	0.004	0.005	ND	ND	ND	ND
1,2-Dichloropropane	mg/L	0.0005	0.005	ND	ND	ND	ND
1,3-Dichloropropene	mg/L	0.0002	0.0005	ND	ND	ND	ND
Ethylbenzene	mg/L	0.3	0.3	ND	ND	ND	ND
Methyl tert-butyl ether	mg/L	0.013	0.013	ND	ND	ND	ND
Monochlorobenzene	mg/L	0.07	0.07	ND	ND	ND	ND
Styrene	mg/L	0.0005	0.1	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	mg/L	0.0001	0.001	ND	ND	ND	ND
Tetrachloroethylene	mg/L	0.00006	0.005	ND	ND	ND	ND
Toluene	mg/L	0.15	0.15	ND	ND	ND	ND
1,2,4-Trichlorobenzene	mg/L	0.005	0.005	ND	ND	ND	ND
1,1,1-Trichloroethane	mg/L	1	0.200	ND	ND	ND	ND
1,1,2-Trichloroethane	mg/L	0.0003	0.005	ND	ND	ND	ND
Trichloroethylene	mg/L	0.0017	0.005	ND	ND	ND	ND
Trichlorofluoromethane	mg/L	1.3	0.15	ND	ND	ND	ND
1,1,2-Trichloro-1,2,2-Trifluoroethane	mg/L	4	1.2	ND	ND	ND	ND
Vinyl Chloride	mg/L	0.00005	0.0005	ND	ND	ND	ND
Xylenes (total)	mg/L	1.8	1.750	ND	ND	ND	ND
Regulated Non-Volatile Synthetic Organic Chemicals							
Alachlor	mg/L	0.004	0.002	ND	ND	ND	ND
Atrazine	mg/L	0.00015	0.001	ND	ND	ND	ND
Bentazon	mg/L	0.2	0.018	ND	ND	ND	ND
Benzo(a)pyrene	mg/L	0.000007	0.0002	ND	ND	ND	ND
Carbofuran	mg/L	0.0007	0.018	ND	ND	ND	ND
Chlordane	mg/L	0.00003	0.0001	ND	ND	ND	ND
Dalapon	mg/L	0.79	0.2	ND	ND	ND	ND
1,2-Dibromo-3-chloropropane	mg/L	0.000003	0.0002	ND	ND	ND	ND
2,4-Dichlorophenoxyacetic acid (2,4-D)	mg/L	0.02	0.07	ND	ND	ND	ND
Di(2-ethylhexyl)adipate	mg/L	0.2	0.4	ND	ND	ND	ND
Di(2-ethylhexyl)phthalate	mg/L	0.012	0.004	ND	ND	ND	ND
Dinoseb	mg/L	0.014	0.007	ND	ND	ND	ND
Diquat	mg/L	0.006	0.02	ND	ND	ND	ND
Endothall	mg/L	0.094	0.1	ND	ND	ND	ND
Endrin	mg/L	0.0003	0.002	ND	ND	ND	ND
Ethylene Dibromide	mg/L	0.00001	0.00005	ND	ND	ND	ND
Glyphosate	mg/L	0.9	0.7	ND	ND	ND	ND
Heptachlor	mg/L	0.000008	0.00001	ND	ND	ND	ND
Heptachlor Epoxide	mg/L	0.000006	0.00001	ND	ND	ND	ND
Hexachlorobenzene	mg/L	0.00003	0.001	ND	ND	ND	ND
Hexachlorocyclopentadiene	mg/L	0.002	0.05	ND	ND	ND	ND
Lindane	mg/L	0.000032	0.0002	ND	ND	ND	ND
Methoxychlor	mg/L	0.00009	0.03	ND	ND	ND	ND
Molinate	mg/L	0.001	0.02	ND	ND	ND	ND
Oxamyl	mg/L	0.026	0.05	ND	ND	ND	ND
Pentachlorophenol	mg/L	0.0003	0.001	ND	ND	ND	ND
Picloram	mg/L	0.166	0.5	ND	ND	ND	ND
Polychlorinated Biphenyls	mg/L	0.00009	0.0005	ND	ND	ND	ND
Simazine	mg/L	0.004	0.004	ND	ND	ND	ND
Thiobencarb	mg/L	0.042	0.07	ND	ND	ND	ND
Toxaphene	mg/L	0.00003	0.003	ND	ND	ND	ND
1,2,3-Trichloropropane	mg/L	0.0000007	0.000005	ND	ND	ND	ND
2,3,7,8-TCDD (Dioxin)	mg/L	0.00000000005	0.00000003	waived	waived	waived	waived
2,4,5-TP (Silvex)	mg/L	0.003	0.05	ND	ND	ND	ND

*Applicable to treated water only

**Values identified as MCLs are Action Levels under the lead and copper rule

***Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

mrem/yr = millirems per year

N/A = Not Applicable

ND = Not Detected

NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Table 13 - Source Water 2022

Constituent	Units	PHG*	MCL*	Source			
				Friant Kern	Groundwater	Aqueduct	Kern River
Unregulated Volatile Organic Chemicals							
tert-Amyl methyl ether	mg/L	N/A	N/A	ND	ND	ND	ND
Bromobenzene	mg/L	N/A	N/A	ND	ND	ND	ND
Bromochloromethane	mg/L	N/A	N/A	ND	ND	ND	ND
Bromomethane	mg/L	N/A	N/A	ND	ND	ND	ND
Tertiary butyl alcohol***	mg/L	N/A	0.012	ND	ND	ND	ND
n-Butylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
sec-Butylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
tert-Butylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
Chloroethane	mg/L	N/A	N/A	ND	ND	ND	ND
Chloromethane	mg/L	N/A	N/A	ND	ND	ND	ND
2-Chlorotoluene***	mg/L	N/A	0.14	ND	ND	ND	ND
4-Chlorotoluene***	mg/L	N/A	0.14	ND	ND	ND	ND
Dibromomethane	mg/L	N/A	N/A	ND	ND	ND	ND
1,3-Dichlorobenzene***	mg/L	N/A	0.6	ND	ND	ND	ND
Dichlorodifluoromethane***	mg/L	N/A	1	ND	ND	ND	ND
1,3-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	ND
2,2-Dichloropropane	mg/L	N/A	N/A	ND	ND	ND	ND
1,1-Dichloropropene	mg/L	N/A	N/A	ND	ND	ND	ND
Diisopropyl ether	mg/L	N/A	N/A	ND	ND	ND	ND
Ethyl tert-butyl ether	mg/L	N/A	N/A	ND	ND	ND	ND
Hexachlorobutadiene	mg/L	N/A	N/A	ND	ND	ND	ND
Isopropylbenzene***	mg/L	N/A	0.77	ND	ND	ND	ND
p-Isopropyltoluene	mg/L	N/A	N/A	ND	ND	ND	ND
Naphthalene***	mg/L	N/A	0.017	ND	ND	ND	ND
Nitrobenzene	mg/L	N/A	N/A	ND	-	-	-
Pentachloroethane	mg/L	N/A	N/A	ND	-	-	-
n-Propylbenzene***	mg/L	N/A	0.26	ND	ND	ND	ND
1,1,1,2-Tetrachloroethane	mg/L	N/A	N/A	ND	ND	ND	ND
1,2,3-Trichlorobenzene	mg/L	N/A	N/A	ND	ND	ND	ND
1,3,5-Trichlorobenzene	mg/L	N/A	N/A	ND	-	-	-
1,2,3-Trimethylbenzene	mg/L	N/A	N/A	ND	-	-	-
1,2,4-Trimethylbenzene***	mg/L	N/A	0.33	ND	ND	ND	ND
1,3,5-Trimethylbenzene***	mg/L	N/A	0.33	ND	ND	ND	ND
Methyl isobutyl ketone***	mg/L	N/A	0.12	ND	ND	ND	ND
Unregulated Non-Volatile Synthetic Organic Chemicals							
Aldicarb***	mg/L	N/A	0.007	ND	ND	ND	ND
Aldicarb Sulfone	mg/L	N/A	N/A	ND	ND	ND	ND
Aldicarb Sulfoxide	mg/L	N/A	N/A	ND	ND	ND	ND
Aldrin***	mg/L	N/A	0.000002	ND	ND	ND	ND
Bromacil	mg/L	N/A	N/A	ND	ND	ND	ND
Butachlor	mg/L	N/A	N/A	ND	ND	ND	ND
Carbaryl***	mg/L	N/A	0.7	ND	ND	ND	ND
Diazinon***	mg/L	N/A	0.0012	ND	ND	ND	ND
Dicamba	mg/L	N/A	N/A	ND	ND	ND	ND
Dieldrin***	mg/L	N/A	0.000002	ND	ND	ND	ND
Dimethoate***	mg/L	N/A	0.001	ND	ND	ND	ND
Diuron	mg/L	N/A	N/A	ND	ND	ND	ND
3-Hydroxycarbofuran	mg/L	N/A	N/A	ND	ND	ND	ND
Methomyl	mg/L	N/A	N/A	ND	ND	ND	ND
Metolachlor	mg/L	N/A	N/A	ND	ND	ND	ND
Metribuzin	mg/L	N/A	N/A	ND	ND	ND	ND
Propachlor***	mg/L	N/A	0.09	ND	ND	ND	ND
2,4,5-T	mg/L	N/A	N/A	ND	ND	ND	ND

*Applicable to treated water only

**Values identified as MCLs are Action Levels under the lead and copper rule

***Values identified as MCLs are Notification Levels or Advisory Levels for constituents lacking MCLs

MCL = Maximum Contaminant Level

MFL = million fibers per liter: MCL for fibers exceeding 10 micrometers in length

mg/L = milligrams per liter (parts per million)

mrem/yr = millirems per year

N/A = Not Applicable

ND = Not Detected

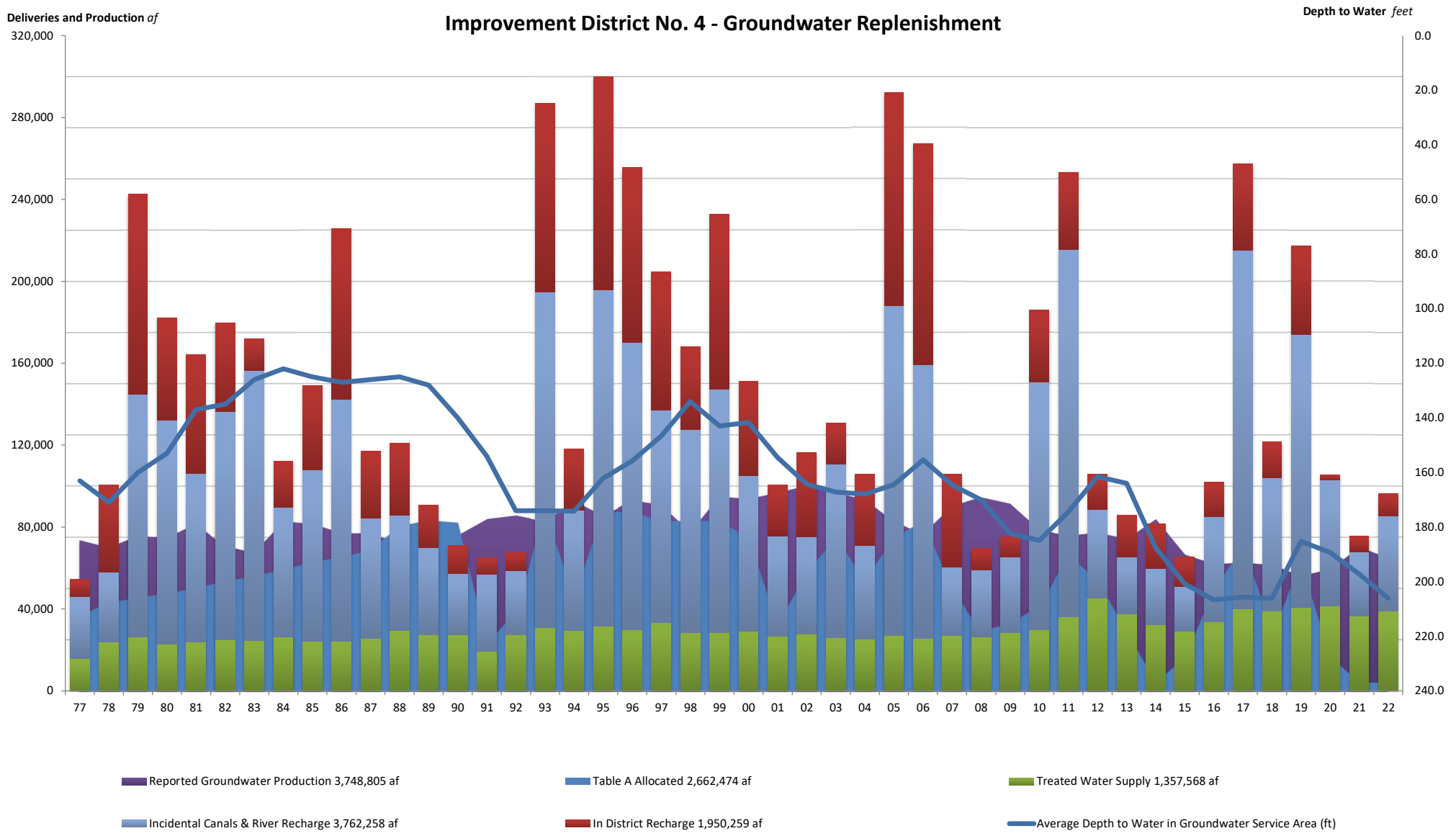
NTU = nephelometric turbidity units

pCi/L = picocuries per liter

PHG = Public Health Goal

uS/cm = microsiemens per centimeter

Figure 1 Improvement District No. 4 - Groundwater Replenishment

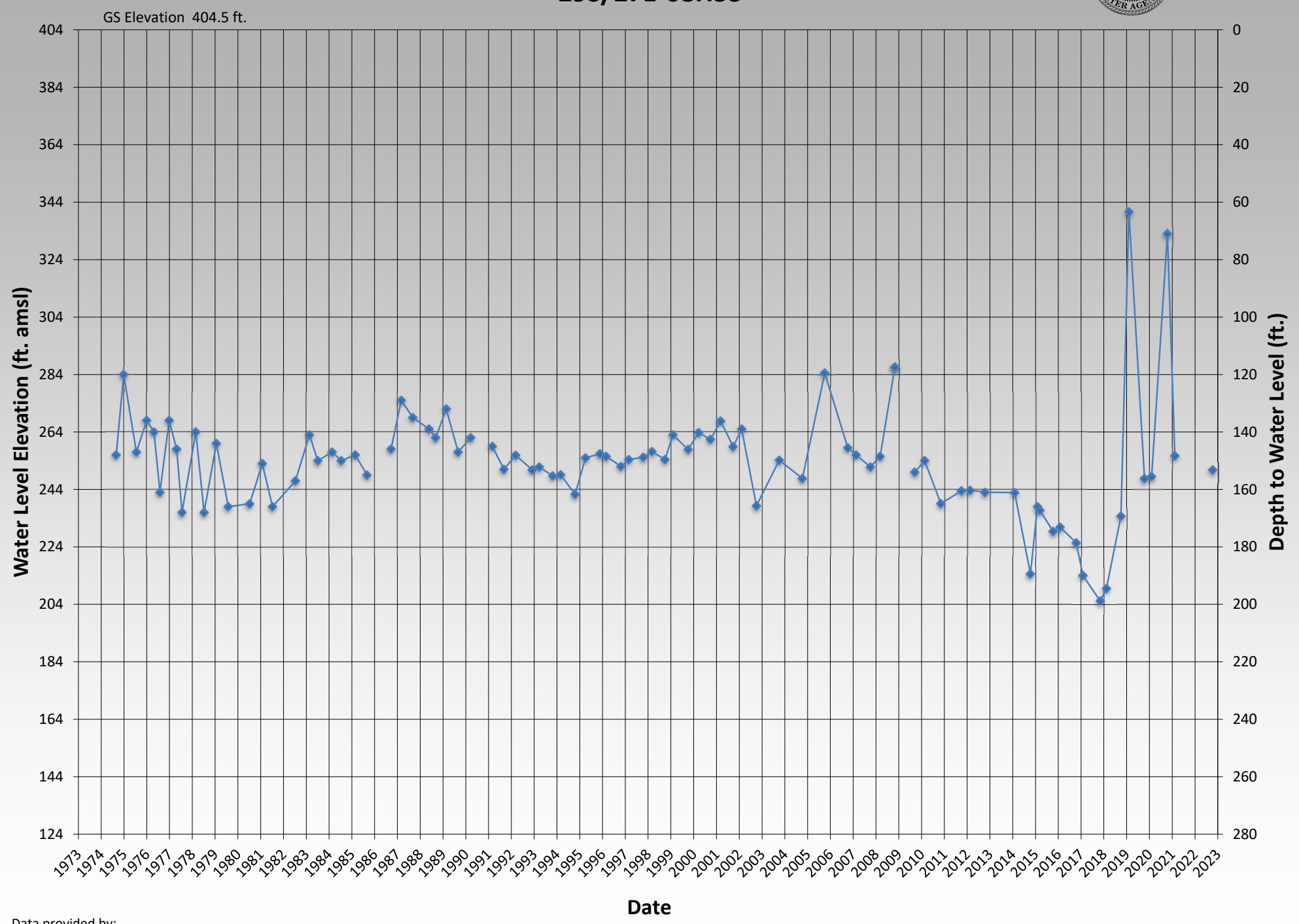




Improvement District No. 4

29S/27E-08H53

Figure 2 29S/27E-08H53



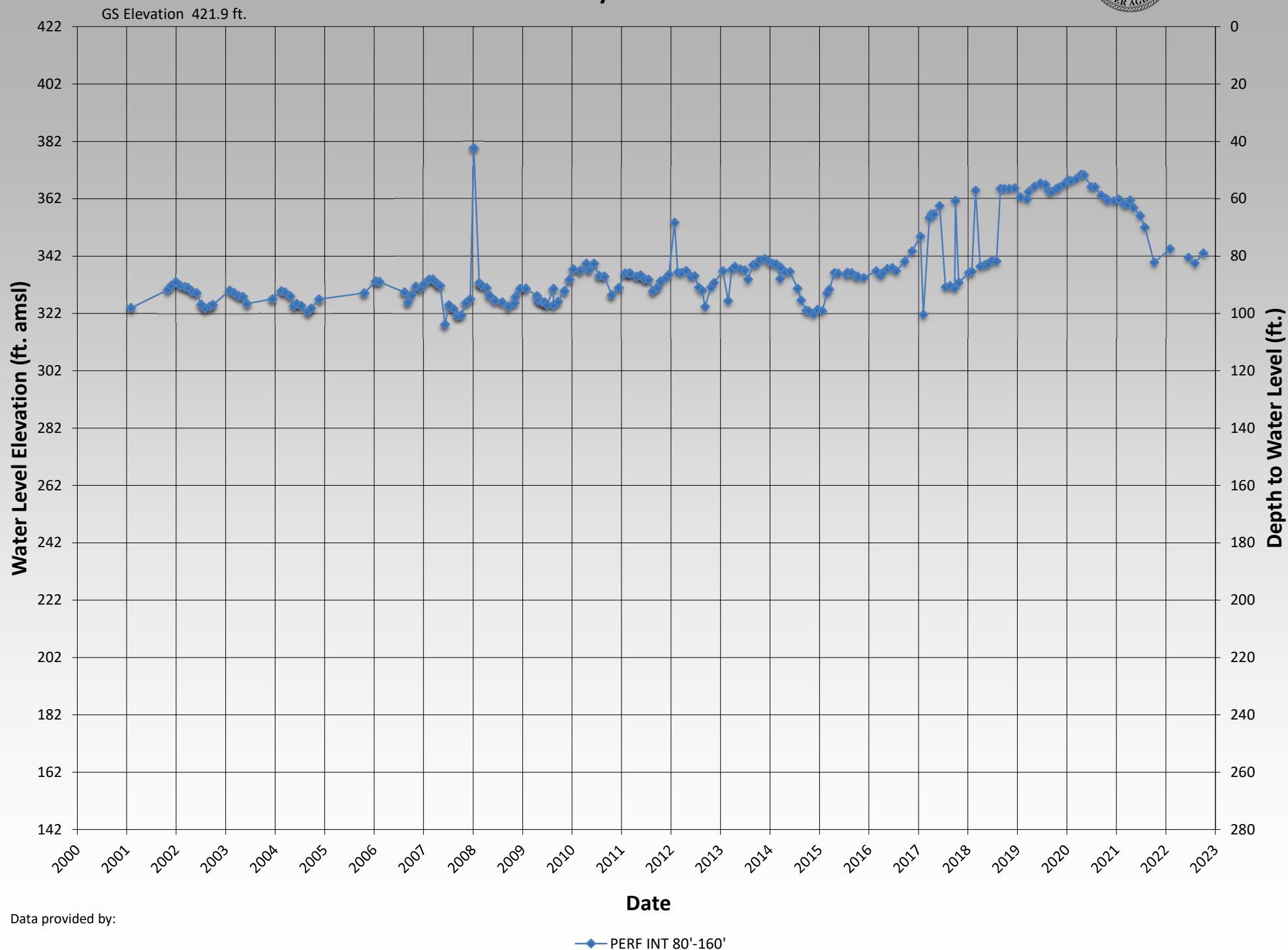
Data provided by:

—◆— PERF INT NOT AVAILABLE



Improvement District No. 4 29S/28E-18K01

Figure 3 29S/28E-18K01



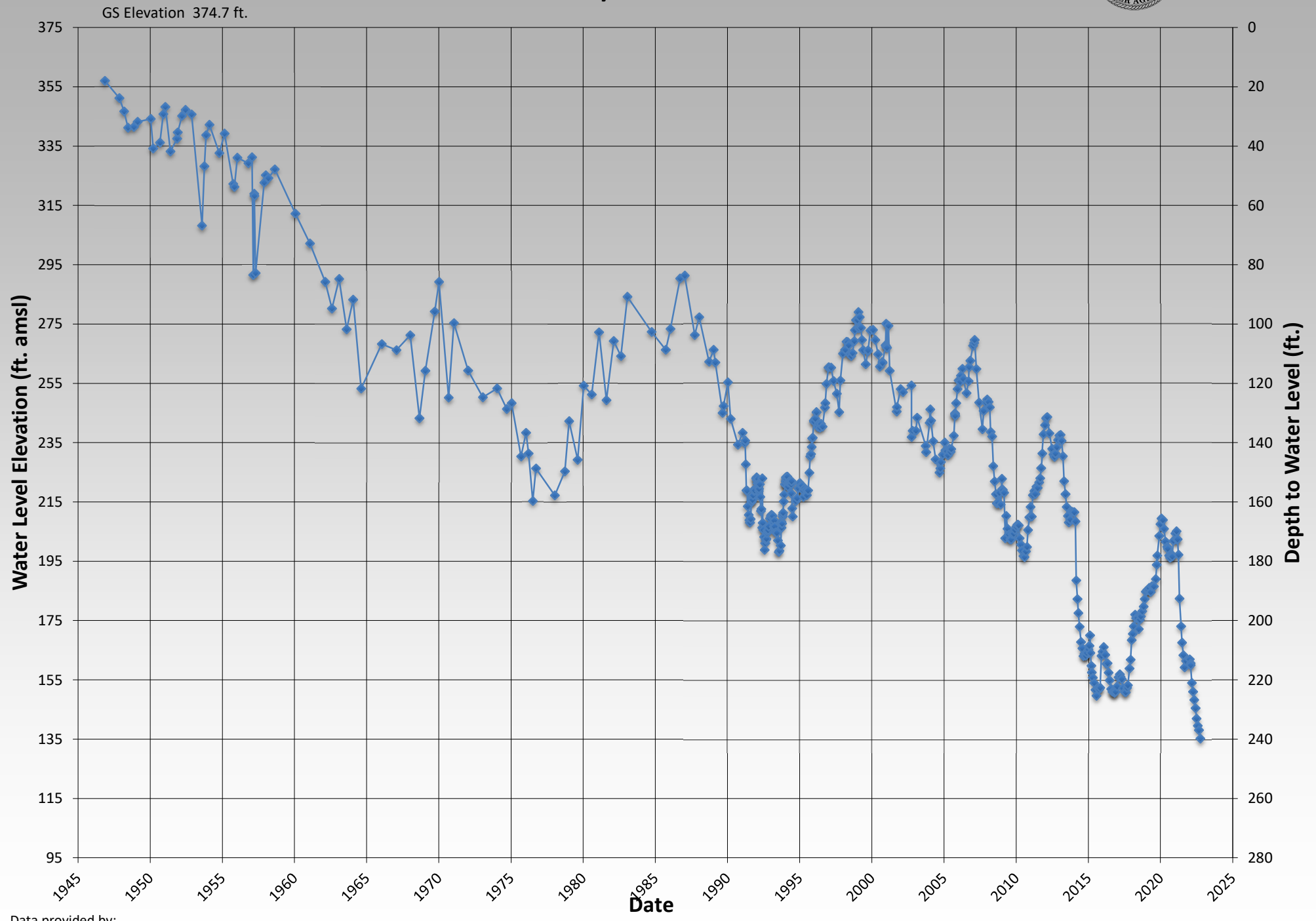
Data provided by:



Improvement District No. 4

30S/27E-05D01

Figure 4 30S/27E-05D01



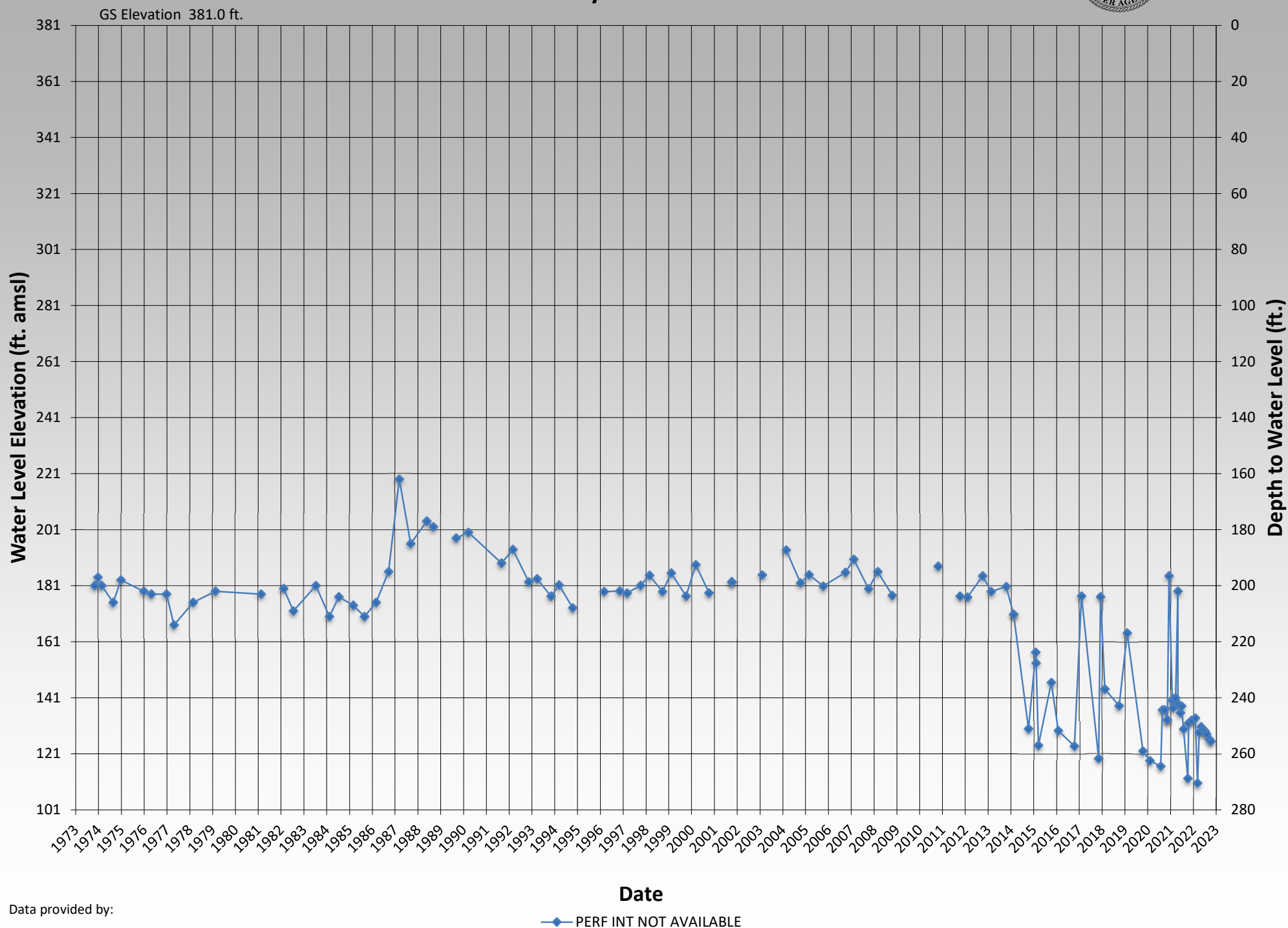
Data provided by:

—◆— PERF INT 85'-504'

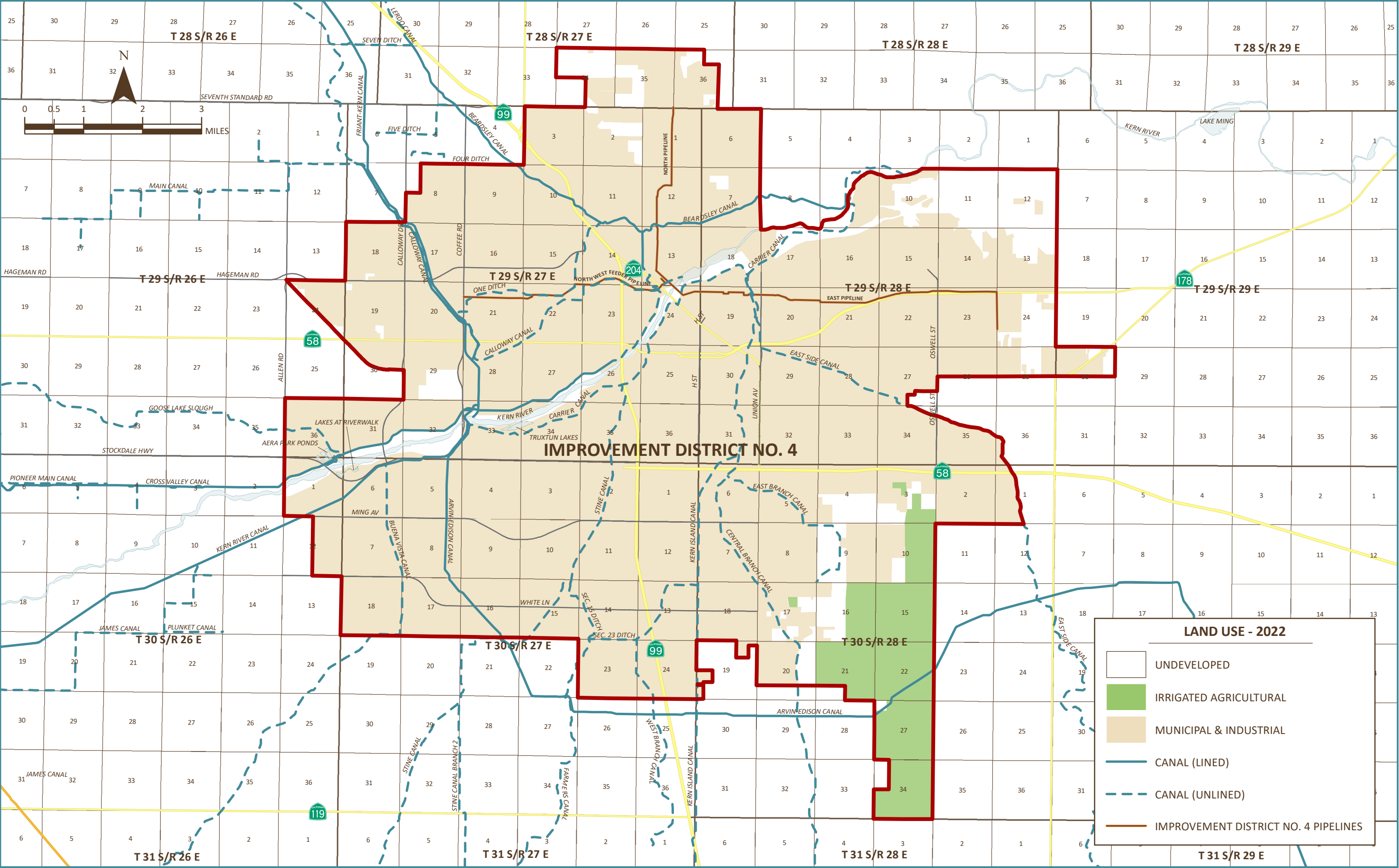


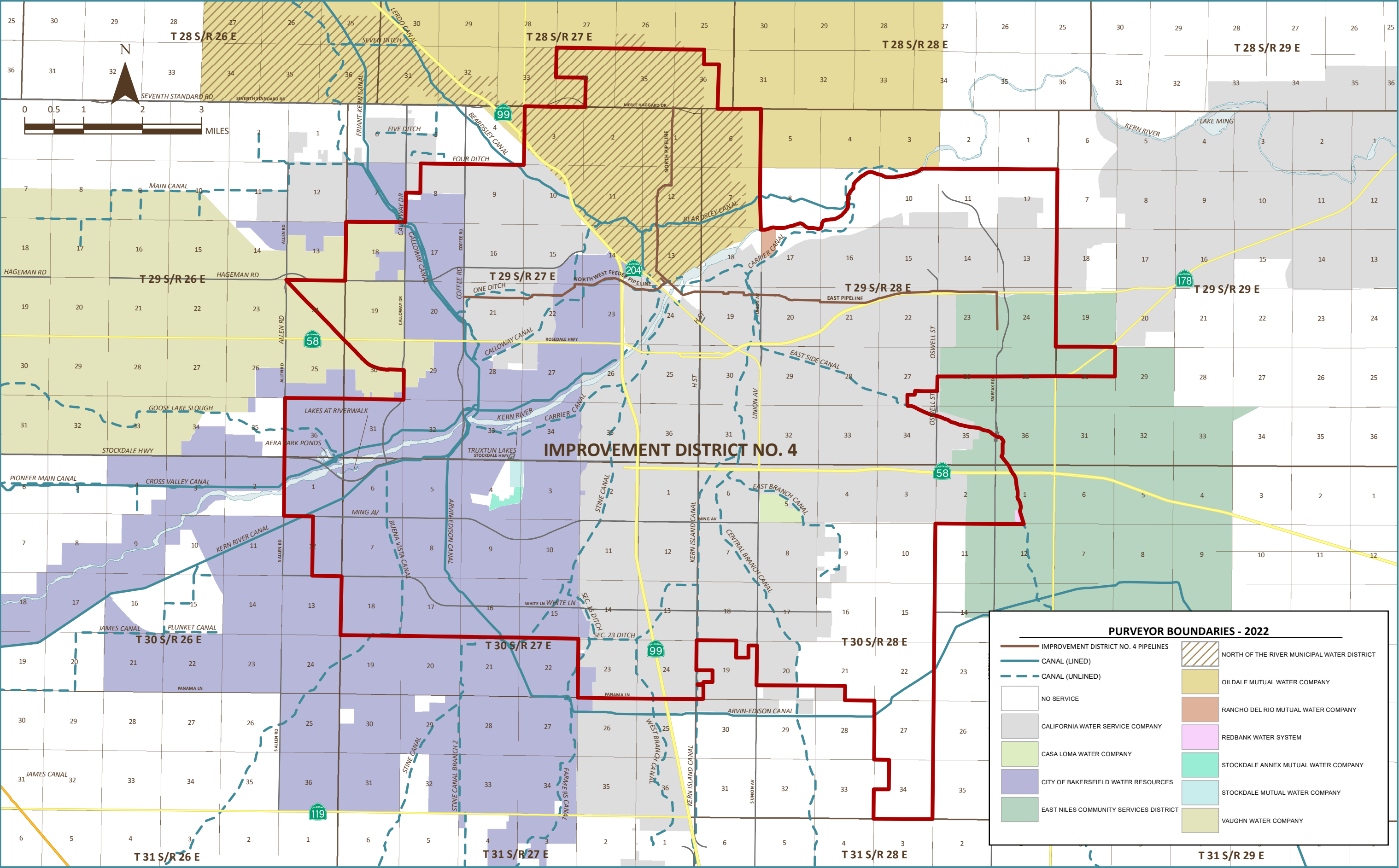
Figure 5 30S/28E-03D01

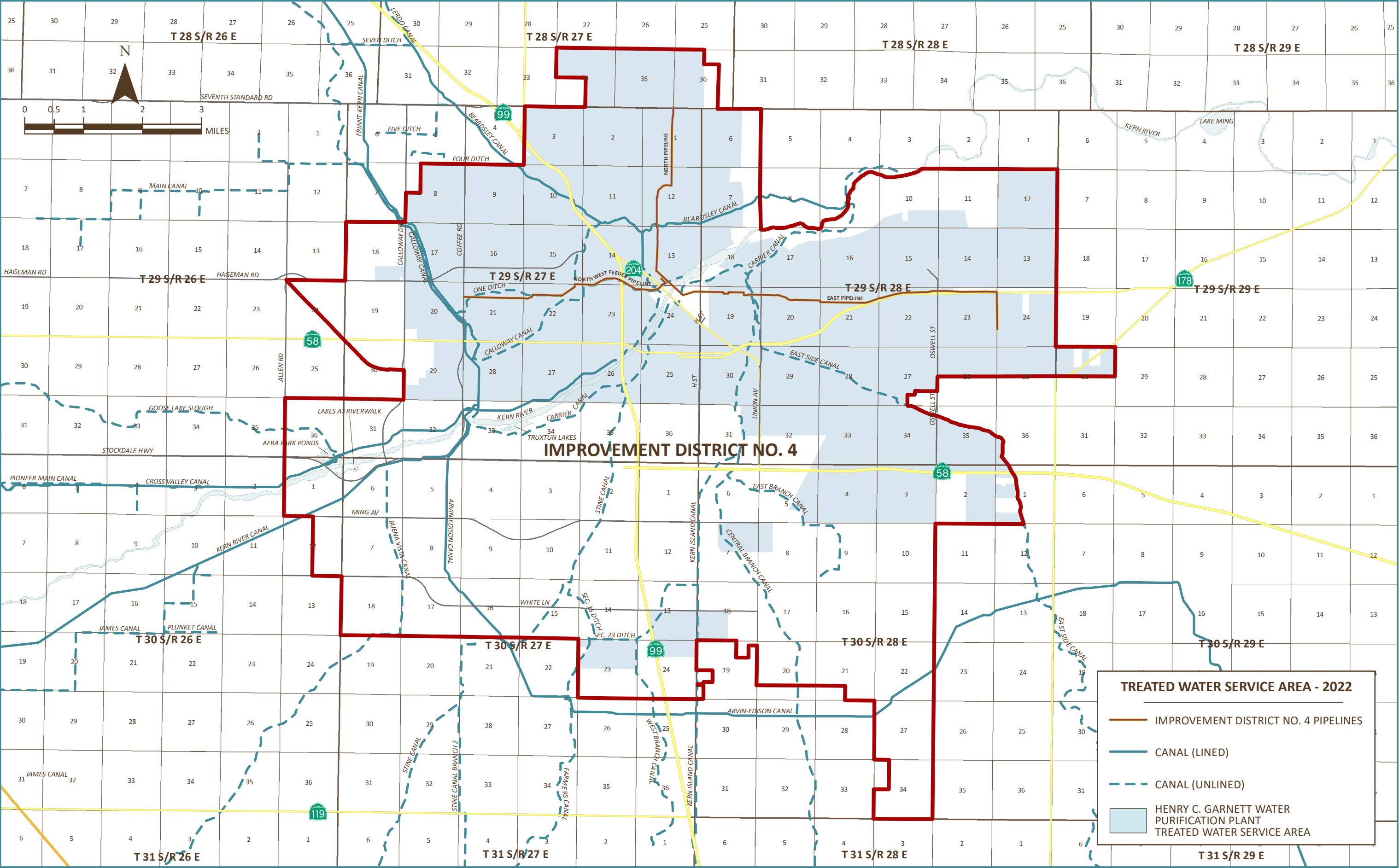
Improvement District No. 4 30S/28E-03D01

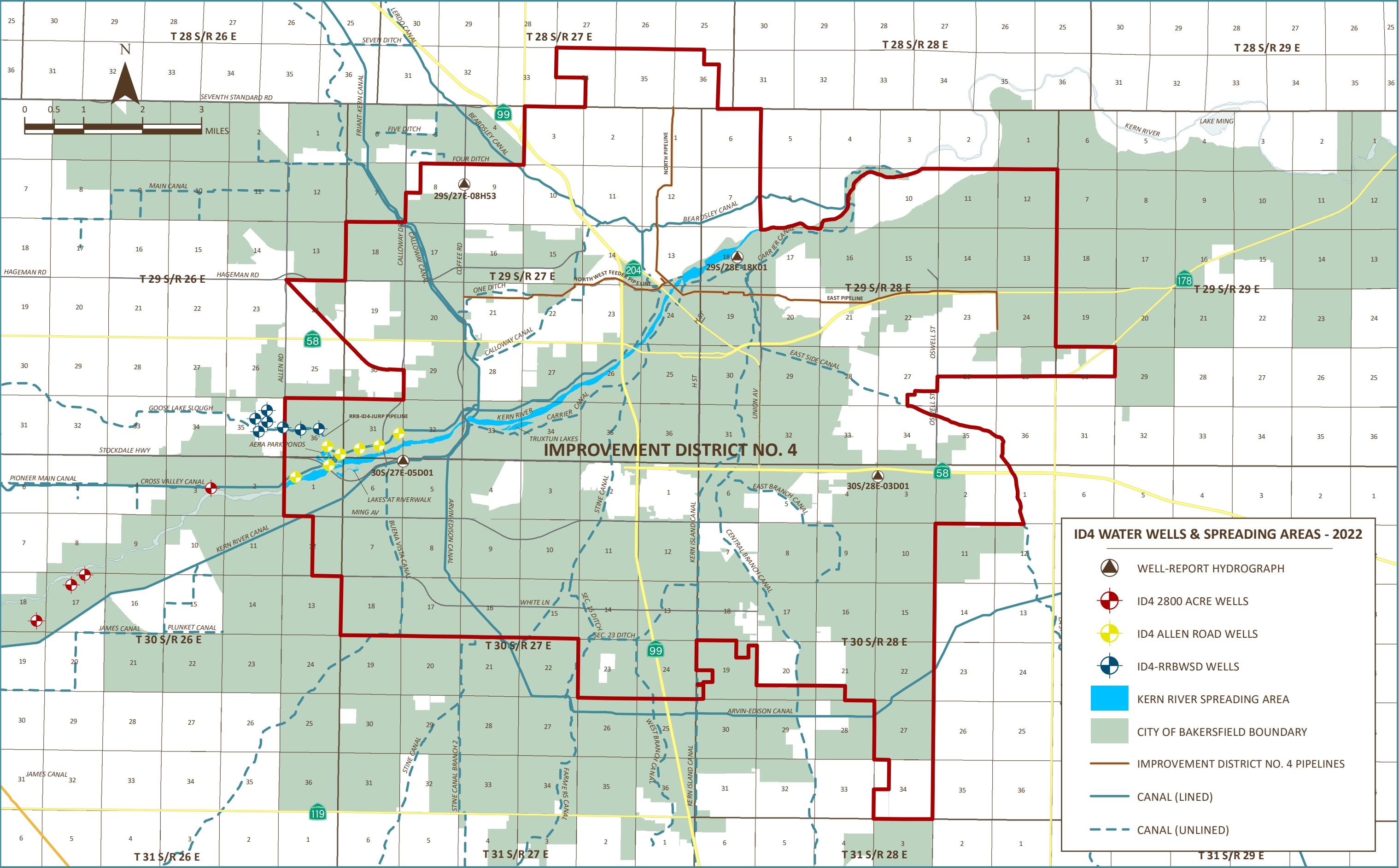


Data provided by:









BY: M. ALLEN
DATE: 11/28/22
REVIEWED BY: K. BUDAK
FILENAME: Plate 4 - Water Wells and Spreading Areas (2022).mxd

