



**West Kern Water District**

**NORTH WELL 1 REPLACEMENT PROJECT**

**WaterSMART Drought Response Program:  
Drought Resiliency Projects for Fiscal Year 2024  
NOFO: R24AS00007**

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**Proposal Submitted to:** Bureau of Reclamation via Grants.gov  
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## 1. TECHNICAL PROPOSAL AND EVALUATION CRITERIA

### 1.1. Executive Summary

**Applicant Name** West Kern Water District

**Task Area:** B

**Funding Group:** Tier II

**Project Estimated Start and Completion (MM/YY):** April 2024 – September 2026

**Project Duration:** 29 months

**Project Summary:**

West Kern Water District will construct a deep aquifer recovery well in its North wellfield to replace water supply lost when NW-1 well was damaged in 2021 due to drought. The drought from 2020 to 2022 was considered the driest 3-year period on record since 1896. During this period, all 58 California counties were under a drought emergency proclamation. This new recovery well will access a deeper stratum of the aquifer than the well that was damaged to provide additional water and sustainability against future droughts by extracting approximately 3,226 Acre Feet per year.

This project is not located on a Federal facility and will not involve Federal lands.

### **Background**

The West Kern Water District (West Kern) is a special district in southwestern Kern County, California in the San Joaquin Valley approximately 30 miles west of Bakersfield and 100 miles north of Los Angeles. It covers roughly 300 square mile area with approximately 7,600 metered accounts serving the cities of Taft, Maricopa and surrounding westside communities of Taft Heights, South Taft, Ford City, Tupman, Dustin Acres, Valley Acres, Derby Acres, Fellows and McKittrick.

West Kern is located within the Tulare Lake Hydrologic Region (Region) of the San Joaquin Valley Groundwater Basin in central California. The Region has 12 distinct groundwater basins and 7 subbasins of the San Joaquin Valley Groundwater Basin. The District is within the Kern County Groundwater Subbasin (Subbasin), which encompasses approximately 3,040 square miles and is bounded by the Sierra Nevada foothills on the east, the Tehachapi and San Emigdio Mountains and White Wolf Subbasin on the south, the Temblor Range on the west, and the County of Kern jurisdictional boundary to the north. The West Kern service area overlies the southwestern portion of the Subbasin. According to the California Department of Water Resources, Bulletin 118, the non-adjudicated basin is in a water-short condition. As recent as 2019, the California Department of Water Resources identifies the Kern County Groundwater Subbasin as critically over drafted, which occurs when the average annual amount of groundwater extraction exceeds the long-term average annual supply of water to the basin. Although the West Kern Water District Groundwater Sustainability Agency is not in overdraft due to its efforts balancing recharge and pumping, the underlying Subbasin is and will continue to be the focus of state and regional efforts to improve the long-term sustainability of

groundwater.

**Water Supply** (from West Kern website): The West Kern Water District contracts with the Kern County Water Agency to receive 31,500 acre-feet of water annually from the State Water Project. This represents the maximum amount the District can request each year. The actual amount delivered is determined annually by the California Department of Water Resources. In years when a 100% supply is received, nearly 30,000 AF of the District's annual State Water Project supply is used to replenish the groundwater basin in the vicinity of its groundwater well fields where it is recovered and delivered with minimal treatment to customers. Only a small amount is delivered directly from the California Aqueduct for industrial use. West Kern maintains a positive banked water balance which allows it to meet in-district demands in dry years.

Surface water is not currently used as a direct domestic supply source. A portion of the untreated surface supply (up to 6,000 AF) is imported directly from the State Water Project (SWP) California Aqueduct to an industrial customer, the balance is delivered, by agreement, to the Buena Vista Water Storage District and exchanged for a previously banked groundwater supply credited to West Kern. Banked groundwater is then recovered and delivered to customers in West Kern's Service Area.

Historically, West Kern manages its operations to maintain a surplus water supply and a positive banked water balance through balanced recharge and pumping efforts. However, as West Kern, along with California as a whole, continue to face climate-related challenges like prolonged and record-breaking droughts, projects like the proposed well replacement become very important to recovering recharged water.

The SWP water that comes to West Kern by contract with wholesaler Kern County Water Agency is transported through the California aqueduct and then recharged into the ground through spreading ponds. Water is extracted from an alluvial aquifer, pumped from West Kern's North and South Well Fields. In the area of West Kern's wellfield, the continental rocks consist of the Plio-Pleistocene Tulare Formation, a thick sequence of water-laden sands, silts, and clays. Throughout much of the San Joaquin Valley, the Tulare Formation contains a regionally extensive lacustrine or lakebed clay, generally referred to as Corcoran Clay, which serves as a confining layer separating the shallow semiconfined to unconfined aquifer system from a deeper confined aquifer system (Urban Water Management Plan, System Supplies, Groundwater). The unconfined aquifer extends to a depth of approximately 200 to 300 feet below the ground surface and consists of interbedded silts, sands, and some clay. Both the North and South wellfields are screened within the semiconfined to unconfined aquifer, with the South wellfield being exclusively within the unconfined to semiconfined aquifer. The confined aquifer system exists in the GSA's North Project Management Area and ranges from approximately 600 to 800 feet below the ground surface (Groundwater Sustainability Plan).

West Kern's water supply facilities include 13 groundwater recovery wells (5 in the North Well Field and 8 in the South Well Field), 26 water storage tanks, and nearly 300 miles of pipeline that convey water to an over 300 square mile service area. The proposed project is located at the North Well Field.

West Kern water customers consist of residential, commercial, and industrial customers. The 2020 Urban Water Management Plan (UWMP) estimates approximately 80% of the water supply is delivered to industrial customers, primarily natural gas power plants that use water for their cooling towers as well as steam powered energy production, and also to oil development companies. The service area population is rural, with a population density ranging from approximate 700 people per square mile in the City of Taft to less than 177 per square mile in the unincorporated areas; the population served by West Kern Water District is estimated to be 22,176 using 2020 Census data. WKWD does not supply water for agricultural uses and imports water which it uses to recharge groundwater in the areas of its recovery well fields.

## 1.2. Project Location

The proposed project is located in the North Recharge and Recovery Project in the North Wellfield area. The new well will be located approximately 3 miles southwest of the intersection of Interstate 5 and Stockdale Hwy, Kern County, California approximately ¼ mile east of Morris Road, and roughly one mile north of Station Road. The geographic location of the new Well No. NW-1R is Section 2 of Township 30 South, Range 24 East, MDBM. GPS: Longitude, 119.363683° W; Latitude, 35.346717° N. (See attachment 1a, Project Vicinity Map and attachment 1b, Project Site Map)

## 1.3. Project Description

West Kern proposes the relocation and replacement of well NW-1 with replacement Well NW-1R that will be drilled to a more drought-resilient depth of 1,000 feet below ground surface (bgs). Constructed at 600 feet bgs, Well NW-1 was taken offline November 14, 2021 after it was permanently damaged by declining aquifer levels from persistent drought conditions when the pumping water level dropped to 325.2 bgs, below the top perforations at 270 bgs. Declining water levels exposed the top of the perforated interval for the well. This exposure results in a condition referred to as *falling water* and that condition carries entrained air into the well and down to the pump that creates cavitation at the pump impeller and damage to the pump. In addition, the declining water levels result in pumping the same volume of water over a reduced screened interval which increases well screen entrance velocities and manifests itself in damage to the well screen by opening the size of the perforations and allowing filter material and sand to enter the well. Despite replenishing levels from 2023 rain fall, the damage to the well and equipment is irreversible and requires replacement.

Well NW-1R will be constructed in a similar manner to Well NW-2, West Kern's one other existing well at the depth of 1,000 feet bgs that has proven effective and more resilient to the impacts of drought. The scope of the proposed replacement project includes abandoning existing NW-1, well site earthwork and subgrade preparation, and well construction and well development. Well construction activities consist of borehole reaming, caliper survey, magnetic deviation survey, casing installation, bottom bentonite seal, installing gravel pack, intra-annular bentonite seals, and annular cement seal. Well development task consists of mechanical development and test pump installation. Though final well design is in progress, preliminary design includes materials such as: 36" conductor casing, 18" diameter pilot hole construction, ream pilot 34" and 30" hole, 18" HSLA blank casing, 18" HSLA perforated casing, as well as

seals, electric motor, pump assembly, and testing.

Well NW-2, West Kern's deepest well in the North Well Field, was constructed in 2011 with HSLA casing to a depth of 1,000 feet bgs. The Second Addendum to the Environmental Impact Report by ESA found that the testing of that well indicated good water quality in the lower confined aquifer at a depth of up to 1,100 feet and the ability for the deep well to provide more stable potable water supply during times of drought and lower pumping levels from the other shallower production wells. Further, a technical memorandum provided by Richard Slade & Associates, LLC reported the deep well (NW-2) will not cause overdrafting of the aquifer or land subsidence. West Kern observed that NW-2 did not sustain the same damage that NW-1 did as a result of the drought.

Replacement well NW-1R will be one of 5 wells at the North Well Field, a groundwater recharge and recovery site. The proposed well replacement is a critical piece of the groundwater banking project's goal to provide West Kern's service area with a more reliable water source. The objectives of the groundwater recharge and recovery project are to provide groundwater recharge, storage, and recovery to aid the management of West Kern's existing and future water supplies, and to manage and increase the reliability of West Kern's existing water supplies.

#### **Performance Measures**

The performance measure to quantify the project benefit will include testing the function of the pump, video survey, gyroscopic deviation survey to check the plumbness and alignment of the well casing. Pumping tests will be performed to determine the maximum operational rate.

The physical condition of West Kern's production wells is routinely evaluated and documented to identify potential issues related to the structural integrity and any change in production. West Kern maintains a regular rehabilitation maintenance program designed to effectively evaluate and enhance well performance. Any issues are addressed immediately.

#### Monitoring Plan

In addition, as a member of the Kern Groundwater Authority, West Kern participates in a coordinated groundwater monitoring program that requires participants measure groundwater levels and collect groundwater quality samples from January 15 through March 30, and again from September 15 to November 15. West Kern is also required to conduct routine monitoring under its drinking water permit.

## **1.4. EVALUATION CRITERIA**

### **1.4.1. Evaluation Criterion A—Project Benefits**

#### **Sub-criterion A1.a: Available Water Supplies**

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

The proposed replacement well NW-1R will be constructed to a depth of 1,000 feet bgs, within the confined aquifer system which will provide access to water supplies that are more resilient to the impacts of drought.

In California, drought is a common occurrence and can span multiple years. The state faced one of its driest three-year periods on record from 2020-2022, with January – March 2022 being the driest on record dating back over 100 years (California Drought Update from May 2023). Water year 2021, from October 1, 2020 to September 30, 2021, was the second driest period on record. In 2021, the Governor declared a state of emergency four times due to extreme and expanding drought conditions, and all 58 counties were under the drought emergency proclamations. The two largest reservoirs of the State Water Project had water storage levels approximately 1.1 million acre-feet below the previous year's levels, which were already low. The extensive dry periods without precipitation caused the California Department of Water Resources to anticipate State Water Project delivery reductions to 5 percent of requested supplies (Executive Order N-7-22). During this time, West Kern observed declining groundwater levels as the water levels of the aquifer underlying West Kern's well field began to fall. Well NW-1 sustained irreversible damages to the casing that did not occur to the north wellfield's deep well, NW-2.

The proposed project will build resilience to drought by accessing groundwater at a depth of 650-1,000 feet bgs, which is less vulnerable to drought than shallower wells. At 650-1,000 feet bgs, the deep well penetrates the aquifer's Corcoran Clay layer (located at 540 to 620 feet bgs), which separates the semiconfined aquifer system from the deeper confined aquifer system. The unconfined aquifer extends to a depth of 200 to 600 feet bgs. West Kern's proposed deep well will be more resilient to drought due to its location within the confined aquifer, as confined aquifers are less influenced by the lack of rain as wells within unconfined water table aquifers (USGS, Drought and Groundwater Levels). This rationale has been proven by the testing and construction of West Kern's deep well NW-2, which produced "results indicating good quality water in a lower confined aquifer at a depth of up to 1,100 feet. At this depth, the wells could also serve as a more stable potable water supply during times of drought and lower pumping levels from the other shallower production wells (West Kern Groundwater Banking Project, Addendum No.2).

It is estimated that the replacement well will provide benefits for 75 years. The well will increase resilience by providing access to deep groundwater during seasons of drought that reduce surface supplies imported from the SWP and allow West Kern to shift from shallow aquifer wells to the deeper aquifer well from which to draw water to meet water supply demands. The deeper well will also improve water management and support recharge of the upper aquifer during more wet or normal conditions when there is increased supply.

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

The additional water supply of 3,226 AFY represents 17% of West Kern's average water year supply of 18,600 AF. West Kern has lost the ability to recover and supply 6,452 AF of water since losing well NW-1 on November 14, 2021, assuming an average production of 2,000 gpm and an annual production of 3,226 AFY. If West Kern is not able to replace this well, it will result in greater demand and stress being placed on the other wells in the district to meet water demands, which could result in wells drawing down water to levels that cause damage to other wells extracting water from the upper strata of the aquifer.



**What is the estimated quantity of additional supply the project will provide and how was this estimate calculated?**

West Kern plans to construct Well NW-1R similarly to the well field's one other deep well, NW-2, with comparable equipment specifications and methods. NW-1R will have an average pumping capacity of 2,000 gallons per minute (gpm) and is anticipated to produce 3,226 acre-feet per year. This benefit is calculated with conversions from gallons per year to acre feet per year. The estimated quantity of additional supply was calculated as follows:

- $2,000 \text{ gpm} \times 60 \text{ min} \times 24 \text{ hours} = 2,880,000 \text{ gallons per day (gpd)}$
- $2,880,000 \text{ gpd} \times 365 = 1,051,200,000 \text{ gallons per year}$
- $1,051,200,000 / 325,851(\text{gal/AF}) = 3,226 \text{ Acre Feet per year (AFY)}$

The *average benefit over ten years = 30,000 AF*, assuming the well is taken offline for a mandatory shutdown of pumping (for a few hours) on a roughly once-per-month schedule be conducted in the well. This shutdown will also provide a surging action that will help in backwashing of the fine-grained materials that may otherwise accumulate within the gravel pack and reduce well efficiency.

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

Replacing well NW-1R to a depth of 550-1,000 ft bgs with a capacity to supply up to 3,226 acre feet per year will increase the resiliency of the equipment to the impacts of drought by accessing the lower confined aquifer, which can serve as a more stable supply during drought conditions or lower pumping levels from the shallower wells. As observed during the latest drought, West Kern's other deep well did not sustain damage that original NW-1 did. As a replacement project, it will not exceed pumping or recovery rates for the area.

**PROJECT TYPE: WELLS**

**What is the estimated capacity of the new well(s), and how was the estimate calculated?**

The well will pump at an average rate of 2,000 gallons per minute. The pumping capacity was calculated based upon previous aquifer pumping tests and historical production data.

**How much water do you plan to extract through the well(s), and how does this fit within and comply state or local laws, ordinances, or other groundwater governance structures applicable to the area?**

The well is located within a wellfield that is permitted to recover up to 12,700 acre feet per year and the project will comply with this capacity limitation.

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

Constructing the deep well will provide access to recover stored water during times of drought



and shortages and to supplement the primary water supplies originally provided by NW-1 prior to its failure.

**Does the applicant participate in an active recharge program contributing to groundwater sustainability?**

West Kern has been participating in an active groundwater recharge program since 1970, cumulatively banking more than 700,000 acre-feet of water historically in the Kern Fan aquifer system.

West Kern actively recharges its groundwater. West Kern is located along the western edge of the Kern County Subbasin and pumps water from an alluvial aquifer. West Kern receives imported surface water from the State Water project, which is used to replenish the groundwater basin in the vicinity of its well fields where it is recovered and delivered with minimal treatment to customers. Only a small amount is delivered directly from the California Aqueduct for industrial use. Imported surface water is recharged into the aquifer through infiltration ponds and then pumped as necessary, with the aquifer functioning as a water bank. West Kern has 13 active groundwater wells and recharge basins of approximately 415 acres, in addition, West Kern has second priority access to approximately 6,862 acres in the adjacent Kern Water Bank and approximately 729 acres in the near-by Tule Elk reserve.

WKWD delivers the majority of its SWP water by exchange with Buena Vista Water Storage District (BVWSD) as part of an in-lieu groundwater pumping/groundwater banking exchange program. BVWSD, which is located adjacent to WKWD’s well fields, typically delivers water from the Kern River and from local groundwater pumping. In the exchange, BVWSD takes WKWD SWP water from the California Aqueduct for its in-district needs instead of pumping local groundwater. WKWD, in turn, can then pump or bank a volume of water equivalent to that which BVWSD would otherwise have pumped.

Current banked reserves of 200,000 AF provide the District with up to 10 years of drought resiliency. West Kern has maintained a positive groundwater balance to buffer against drought impacts, validating West Kern’s groundwater sustainability program.

**Provide information documenting that proposed well(s) will not adversely impact the aquifer it/they are pumping from (overdraft or land subsidence).**

The following table represents the wells currently located in the north wellfield.

North Wellfield Well No.	Built	Well Depth (bgs)	Dia.	Screen Perforation Depths (feet bgs)	Casing description	Pumping Capacity (gpm)	Status
1	April 2011	600	18"	270 - 570	steel	3,000	Failed, due to drought
2	Sept. 2011	1,000	18"	650 - 980	steel	3,000	Active

North Wellfield Well No.	Built	Well Depth (bgs)	Dia.	Screen Perforation Depths (feet bgs)	Casing description	Pumping Capacity (gpm)	Status
3	May 2011	565	18"	245 - 545	steel	2,500	Active
4	Oct. 2011	555	18"	285 - 535	steel	2,500	Active
5	Mar. 2011	560	18"	220 - 540	steel	2,500	Active

In August 2023, Richard C. Slade and Associates, LLC prepared a technical memorandum summarizing key construction and operational details for West Kern North Wellfield NW-2 well function and evaluated use of the well on different aquifer strata based on data from its original in-service date of September 2011 to present. This well was selected to assess the potential impacts from the proposed NW-1R well because well NW-2 is constructed a depth and specification that is similar to that of the proposed NW-1R well.

Geophysical electric logs (E-logs) exist for pilot hole and display numerous potential aquifers to the total depth of the drilled pilot hole. Basic subsurface conditions, according to RCS are:

- Young alluvium, ground surface to ~95 ft bgs
- Older Alluvium deposits between ~95 ft and ~270 ft bgs
- Turlare Formation at approx. 270 ft to ~ 1,100 bgs
- E-Clay (or equivalent), possibly from ~620 to ~640 ft bgs.

Well NW-2 is the deepest well of the five wells in the North Wellfield constructed to a depth of 1,000 ft below the ground surface (bgs). The NW-2 well was constructed with HSLA casing to a depth of 1,000 bgs with louver casing perforations with 0.070 slot openings.

NW-5 Well constructed to a depth of 560 ft bgs was also tested for potential impacts to the shallow levels of the aquifer caused by NW-2 well pumping from the deeper aquifer.

Six isolated aquifer zone tests were conducted in open pilot boreholes (See tables 3 and 4 of the technical memorandum). After pumping development, packer testing was conducted. Subsequently, a four-point step drawdown test and final 24-hour constant rate test were conducted in late-August 2011. Possible water level changes resulting from the pumping tests of NW-2 were monitored with transducers in the nearby, more shallow wells (NW-5, NW-1 and NW-3) and no water level drawdown interference was detected in these three other onsite shallow wells.

The proposed NW-1R well is to replace the failed NW-1 well and will be drilled to a depth of 1,000 bgs and will be constructed similar to well NW-2. As noted in the technical memorandum, the new replacement well will not cause overdraft of the aquifer or land subsidence.

See Attachment 3, Richard Slade and Associates, LLC. Technical Memorandum regarding Key Items from the Construction & Testing of WKWD North Wellfield Well NW-2 for the technical summary of the aquifer testing.

**Describe the groundwater monitoring plan and the associated monitoring triggers for mitigation actions. Describe how the mitigation actions will respond to or help avoid any significant adverse impacts to third parties that occur due to groundwater pumping.**

On November 29, 1995, the West Kern Water District Board of Directors authorized preparation of a Groundwater Management Plan (GMP) and adopted the final plan in February 1997 (Woodard & Curran, 2019). The GMP's objectives were to protect the quality of West Kern's groundwater supply, promote and improve existing monitoring activities, and enable West Kern to identify and implement necessary means to preserve and enhance their groundwater resources. West Kern currently monitors water levels in all wells and measures the total production at each production well monthly. Water levels from wells in the vicinity of West Kern's wellfield are monitored in a joint effort with the Kern County Water Agency (KCWA). Water quality samples at these wells are collected as required by federal and state drinking water standards. General mineral, general physical, inorganic chemical, volatile organic, and synthetic organic chemical analyses are conducted once every three years. Radiological testing is conducted at each well once every four years for four consecutive quarters. Raw water well samples are also collected on a monthly basis from each operating well for bacteriological analysis. The GMP also identified nine action items to increase the frequency and efficiency of monitoring efforts.

In 2014, the California legislature enacted the Sustainable Groundwater Management Act in response to continued overdraft of California's groundwater resources. The Kern County Groundwater Subbasin is one of 21 basins and subbasins identified by the California Department of Water Resources as being in a state of critical overdraft. In 2016 West Kern Water District Groundwater Sustainability Agency (GSA) was created to manage area defined by the West Kern service boundary along with some additional parcels owned and operated by oil production companies and other private landowners. The West Kern GSA boundary lies within the Kern County Subbasin. Minimum thresholds and measurable objectives were set to allow for an appropriate margin of operation flexibility to allow for normal operations and transfers of water as regularly conducted and sustainable operation by West Kern. Through coordination efforts, neighboring GSAs' minimum thresholds and measurable objectives were also taken into consideration. (See Attachment 1d - Water Burden Map, depicting the groundwater threat)

Monitoring networks for four sustainability indicators that apply in the Subbasin monitor conditions across the Subbasin and detect trends toward undesirable results. Specifically, the monitoring network was developed to do the following:

Monitor impacts to the beneficial uses or users of groundwater.

- Monitor changes in groundwater conditions relative to measurable objectives and minimum thresholds.
- Demonstrate progress toward achieving measurable objectives described in this Chapter GSP.

- Quantify annual changes in water budget components.

The monitoring networks were designed by evaluating data sources provided by DWR, including information from the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, the U.S. Geological Survey, participating agencies. The monitoring network consists of wells that are already being used for monitoring in in the WKWD GSA Area. WKWD manages 72 production, monitoring, completion wells in its service boundary. Some of the data for these wells are included in DWR and USGS datasets.

**Sub-Criterion A2.a: Climate Change**

USBR Sacramento and San Joaquin River Basins – SECURE Water Action Section 9503(c) Report to Congress broadly describes the Sacramento, San Joaquin, Tulare Lake Basins, the current and projected climate changes, and the impacts of those changes.

Among other vulnerabilities, drought is identified (pg. 4) as a regular occurrence worsened by temperatures increasing. As a result, recent droughts have contributed to progressively severe impacts in agricultural, natural, and urban environments. The period from 2012 to 2015 was the driest period in the recorded history of the Central Valley and was estimated to be the driest in the last 1,200 years. These drought conditions led to the death of an estimated 100 million trees in the watersheds surrounding the Central Valley, and contributed to the occurrence of intense wildfires, soil erosion, reduced upper watershed water retention capacity, and increased reservoir sedimentation. While these impacts are occurring across a region larger than the West Kern service area, the impacts are similar. The SECURE Act report recommended adaptation strategies include improving operational efficiency by implementing conjunctive groundwater management, enhancing groundwater recharge, improve salinity and nutrient management, improve river temperature management, and increase surface storage.

To address subsections A2.a Climate Change, A2.b Environmental Benefits, and A2.C Other Benefits, West Kern prepared a table to identify the benefits applicable to the proposed project. Benefits applicable to the project are indicated with a response of ‘Yes’ and a description of those benefits are included underneath the table.

<b>Climate Change and Adaptation Benefits</b>	<b>Project Applicable</b>
<b><i>A2.a Climate Change</i></b>	
Natural hazard risk reductions for hazards such as wildfire or flood	Yes, Fire suppression
Establish and use a renewable energy source	Yes, uses solar energy to power well operations
Reduce greenhouse gas emissions by sequestering carbon in soils, grasses, trees and other vegetation?	N/A
Green or sustainable infrastructure to improve community resilience	N/A
Reduce or mitigate climate pollutions such as air or water pollution	N/A

<b>Climate Change and Adaptation Benefits</b>	<b>Project Applicable</b>
Conservation or management component that promotes healthy lands and soils or serves to protect water supplies and associated uses	Yes, protects water supplies in shallow aquifer
Climate change resiliency in other ways not described above	N/A
<b>A2.b Environmental Benefits</b>	
Improve ecological climate change resiliency of a wetland, river, or stream to benefit to wildlife, fisheries, or habitats, and/or support an endangered or threatened species	N/A
Types and quantities of environmental benefits provided, such as the types of species and the numbers benefited, acreage of habitat improved, restored, or protected, or the amount of additional stream flow added	N/A
<b>A2.c Other Benefits</b>	
Assist States and water users in complying with interstate compacts	Yes
Benefits to multiple sectors and/or users (agriculture, municipal and industrial, environmental, recreational, or others)	Yes
Benefits to a larger initiative to address sustainability	Yes
Benefits to prevent a water-related crisis or conflict	Yes

**Establish and use a renewable energy source.**

The proposed replacement well will be connected to and powered by an existing solar power array that has been powering all of the wells located in the north wellfield. The district-owned solar power arrays located at the north wellfield produces 2.5 megawatts of power, providing 100% of the power required to operate all five of the wells located in this wellfield, including the new NW-1R well.

**Conservation or management component that will promote healthy lands and soils or serve to protect water supplies and its associated uses.**

The well is part of a groundwater recharge and recovery site. West Kern recovers its imported water supply through the extraction wells. Analysis of the project impacts found the project recharge will have an overall positive impact to local groundwater levels and to the overall basin groundwater levels. The recharge mound will compensate for groundwater recovery drawdowns related to groundwater extraction and provide the basin with an increase in stored water (Final Environmental Impact Report).

The groundwater basin is the subject of multiple plans and multi-agency collaboration and management. The *Kern County General Plan* includes elements to protect the groundwater and surface water resources of the county through various goals and policies. The following policies would apply to the proposed project:

- Encourage the development of the County’s groundwater supply to sustain and ensure

water quality and quantity for existing users, planned growth, and maintenance of the natural environment.

- Encourage effective groundwater resource management for the long-term benefit of the County through the following:
  - Promote groundwater recharge activities in various zone districts.
  - Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
  - Support the development of Groundwater Management Plans.
  - Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.

West Kern maintains an Urban Water Management Plan that evaluates water supply sources, water demand, reliability, and water shortage contingency planning, as well as a Groundwater Sustainability Plan that includes management actions to maintain the sustainability of the Kern subbasin.

#### **Benefits to Multiple Sectors**

West Kern is a retail water agency and delivers water directly to customers. West Kern delivers disinfected groundwater to residential, commercial and industrial customers. The Urban Water Management Plan estimates 6,350 residential connections, 600 commercial connections, and 380 industrial connections that receive the treated groundwater. The industrial connections include, the Elk Hills oilfield, Buena Vista Golf Course, a Federal Prison (temporarily closed for rehabilitation of the facilities to meet Bureau of Prisons standards), La Paloma Power Plant (a 1.0 gigawatt power generation facility), Sunrise (a 0.5 gigawatt power generation facility), and Occidental of Elk Hills Cogen Power (a 0.5 gigawatt power generation facility) Plants.

These sectors will benefit from the proposed project and its purpose to provide reliable access to water supply.

#### **1.4.2. Evaluation Criterion B—Planning and Preparedness**

##### **Explain how the applicable plan addresses drought.**

West Kern’s Urban Water Management Plan-2020 Update (UWMP) is a planning document that evaluates water demands and supplies, water reliability, and water conservation strategies. The UWMP identifies and quantifies adequate water supplies for existing and future demands in normal, single-dry, and multiple-dry years; and implements conservation and efficient use of water supplies. It is a planning document that is used as a tool to guide the actions of water management agencies and provide a broad perspective on water supply issues.

West Kern’s UWMP contains drought-focused elements that include:

- Supply and demand assessments for normal, single-dry, and multiple-dry year scenarios
- A Drought Risk Assessment (Section 7.5) that evaluates West Kern’s ability to meet a 5-

year drought if it occurred over the next 5 years.

- An Analysis of Climate Change Impacts on Water Demands, Supplies, and Reliability, including the impacts of increased temperatures, changes in precipitation, and droughts.
- West Kern’s Water Shortage Response Plan that addresses stages of action in response to water supply shortages (including droughts). The WSRP establishes six levels of response actions to be implemented in times of shortage (Response Level 1 through Response Level 6), with increasing restrictions on water use in response to worsening drought conditions and decreasing available supplies.
- Demand Management Measures and programs to achieve water use targets. West Kern has special water conservation programs that can be implemented in the event of drought or other water supply issues.

**Describe how the drought plan includes consideration of climate change impacts to water resources or drought.**

The UWMP Section 7.7 Climate Change Impacts on Water Demands, Supplies, and Reliability addresses climate changes at both the state level and the local level using data from the Climate Change Vulnerability Assessment prepared for the Kern County Integrated Regional Water Management Plan. At the state level, climate models project that California will experience increased temperatures, 25% decrease in snowpack, increases in precipitation, a change in timing of water runoff due to warming winter temperatures, greater extremes in flooding and droughts, and sea level rise which could impact the Delta Water quality and Delta Water deliveries. These changes are of significant concern to West Kern because the district relies on imported water to meet water demands. Local rainfall provides only a small contribution to landscape irrigation and groundwater recharge in West Kern service area.

The Vulnerability Assessment prioritizes vulnerabilities in Kern County, including vulnerabilities in the Tulare Lake Basin, and describes the likely effects of climate change on water management. For example, a 1.1 to 2 degrees Fahrenheit increase in temperature is identified as a significant impact to water resources. Increased global temperatures can lead to increased evaporation, drier soils, changes to precipitation patterns, increased water use, and faster snowmelt, all of which could impact the State Water Project. West Kern imports SWP water and “reductions in imported water supplies would lead to increased reliance on local groundwater, recycled water, or other sources of supplies if demand was not reduced” (UWMP, pg. 61). The section describes climate change impacts to water demand, water supplies, and water supply reliability in the Kern Country region, as well as several strategies to adapt to climate change. Strategies include urban water conservation, water transfers, conjunctive use programs (primarily groundwater storage within West Kern), and support projects that could improve the reliability of imported State Water Project water. The predicted climate changes indicate an increased need to groundwater recharge and recovery wells and indicates a need for deeper wells to access water and allow shallower aquifers to recharge. On pages 60 and 61, the UWMP specifically states,

“Also, changes in local hydrology could affect natural recharge to the local groundwater



aquifers and the quantity of groundwater that could be pumped sustainably over the long-term. Decreased inflow from runoff, increased evaporative losses, and warmer and shorter winter seasons can alter natural recharge of groundwater. Furthermore, additional reductions in the imported water imposed by climate change would lead to more reliance on local groundwater, resulting in reductions in base flows, reduced groundwater outflows, **increased depth to groundwater** [emphasis added], and increased land subsidence.

WKWD (aka West Kern) will need to meet these potential reductions in SWP surface water supplies by improved water efficiency measures, additional groundwater recharge or a reduction in groundwater pumping in wet years to leave water in the aquifer for drier years.”

**When was the plan developed and how often is it updated?**

The California Water Management Planning Act requires plan updates every five years. West Kern prepared its update to the 2015 UWMP in 2020 to comply with new requirements and regulations to include a drought risk assessment and water shortage plan.

**Was the drought plan developed through a collaborative process?**

West Kern coordinated with the general public and with other water agencies. Outreach included: 1) notifying agencies of the plan to update the UWMP; 2) collecting data from agencies; 3) making the Draft UWMP available at the WKWD office; 4) soliciting input on the draft UWMP; 5) publishing notices in local newspapers; and 6) holding a public hearing to solicit comments and adopt the UWMP. Copies of the draft UWMP were submitted to the cities of Taft and Maricopa, Buena Vista WSD, Rosedale-Rio Bravo WSD, Kern County Water Agency, Kern Water Bank, County of Kern Council of Governments, and County of Kern. West Kern released a preliminary draft in order to solicit input and adopted the UWMP at a public hearing. The initial plan update was adopted in 2021, and then revised and readopted in January 2023 after incorporating comments from the California Department of Water Resources. (see attachment 4 - UWMP, Appendix D, pages 83-93)

**Describe how your proposed drought resiliency project is supported by an existing drought plan. Does the drought plan identify the proposed project as a potential mitigation or response action? How is the proposed project prioritized in the drought plan?**

The UWMP did not anticipate the failure of NW-1 well; however, production from this well is included in the water supply discussed in the plan.

**Does the proposed project implement a goal or need identified in the drought plan? Is the supported goal or need prioritized within the plan?**

Water supply reliability is a stated goal in section 7 of the UWMP to deliver a reliable and high-quality water supply for their customers, even during dry periods. Drilling a new, deep aquifer well to replace the failed shallower NW-1 supports this goal to provide greater resiliency during water supply shortages from SWP and/or the shallow levels of the aquifers. Continued balanced pumping of groundwater and recharge of imported supplies has and will continue to be the operational norm for West Kern. It is consistent with the intent of the UWMP to ensure water supply reliability in the short and long-term.

### 1.4.3. Evaluation Criterion C—Severity of Actual or Potential Drought or Water Scarcity Impacts to be addressed by the Project

**Describe the severity of the impacts that will be addressed by the project. Describe recent, existing, or potential drought or water scarcity conditions in the project area.**

As a result of the prolonged drought and a record dry period from January-March 2022, Governor Newsom issued Executive Order N-7-22 that required, in part, urban water suppliers like West Kern to implement a water shortage response action for a shortage level of up to 20%. This requirement triggered implementation of “Level 2” (Moderate Water Shortage) actions of West Kern’s Water Shortage Response Plan (WSRP), which was to be implemented by June 10, 2022.

The recent record rainfall and snowpack for water year 2023 has resulted in above average flows in the Kern River. West Kern is taking advantage of those high flows to recharge groundwater and improve water levels and quality near its production wells.

This project will provide drinking water security and water sustainability. It will provide a way to distribute its available water supplies across its service district. This will substantially decrease the likelihood of a public health and safety crisis resulting from a water shortage and provide peace of mind to residents dealing with the stresses of knowing that a lack of drinking water is a real possibility.

**Is the project in an area that is currently suffering from drought, or which has recently suffered from drought or water scarcity?**

The proposed project is in Kern County, California, which is not currently experiencing a drought as shown on the U.S. Drought Monitor due to receiving record amounts of rainfall during the recent winter months. However, Water year 2021 –October 1, 2020 to September 30, 2021 – was California’s second-driest on record, based on statewide precipitation, with the driest being 1924, [according to a report](#) from the California Department of Water Resources. The state experienced its worst drought since the late 1800s, as measured by both lack of precipitation and high temperatures.

Since the development of the North Project wellfield in 2011, California has seen two severe droughts. The first was from 2012 to 2017 and more recently a drought occurred from 2020 to 2022. During these climatically dry periods, SWP allocations were historically low due to the increasing and compounding impacts of climate change. This has resulted in an overall greater dependence on the recovery of banked water in the western Kern River fan area to meet water demands.

These hydrology variations have greatly increased West Kern’s and adjacent water suppliers’ dependence on banked water. This new dynamic has resulted in groundwater level declines that have created issues with falling water inside well casings that can cause pump cavitation and damage, increased groundwater entrance velocities that can result in well casing damage, the buildup of chemical precipitates and biological growths on casing perforations which further decreases well efficiencies and changing water quality.

**Describe any projected increases to the severity or duration of drought or water scarcity in the project area resulting from changes to water supply availability and climate change.**

Groundwater has long been a reliable water resource in California. According to the California Department of Water Resources (DWR), groundwater provides about 38% of the entire state water supply during average rainfall years and up to 46% or more during dry years. It serves as a buffer against the impacts of drought and climate change. With the extreme weather patterns California experiences, floods or droughts, storage is the only solution to hold excess water for later use.

Suitable groundwater basins can provide ample storage space without the environmental or financial concerns common with surface storage. Conjunctive use of stored surface water and groundwater ensures reliable availability and operational flexibility. Construction of a new deeper well in the North Project area will allow the West Kern to increase access to banked water from deeper portions of the same aquifer system. The replacement well will help continue to build long-term resilience to drought by replacing the shallow well damaged by drought with a deep aquifer well. The replacement well is planned to be a primary supply during periods of curtailment and drought when there is a lack of surface supplies. The well will also be operated for aquifer storage recharge of the upper aquifer during periods of an abundance of surface supplies by allow West Kern the flexibility to not use shallower wells. The proposed replacement well is expected to provide benefits for 75 years before major rehabilitation is required.

This added production and recharge capacity will improve the management of water supplies by increasing operational flexibility during normal years and improve the ability to deliver water during periods of drought and curtailment. The functionality of the well is a sustainable solution which enables the district with maximum flexibility to not only increase usage of its groundwater supply but represents a sustainable management tool to recharge the groundwater supply such that the groundwater supply is available for future generations.

**What are the ongoing or potential drought or water scarcity impacts to specific sectors in the project area if no action is taken and the severity of those impacts?**

The primary industries served by West Kern are: Electrical Generation, Oil Industry, and Golf courses.

- Electrical Power Generation utilizes steam or natural gas, which power turbines to generate electricity. Both systems require a large amount of water for cooling tower operations. West Kern delivers water to two power plants:
  - 1) The Elk Hills Power (EHP) project, a nominal 550-megawatt (“MW”) combined-cycle natural gas fired power plant configured with two General Electric Frame 7FA gas turbines that exhaust into two heat recovery steam generators (“HRSGs”) with supplemental fired capacity, and a single 250 MW steam turbine located near the community of Tupman, Kern County and is served by the West Kern Water District. EHP delivers electricity to the EHP 230kV switchyard, which then is transmitted via a

generation tie line to the interconnection point at the PG&E Midway Substation. Exhaust gas for the combustion turbine generators for the generation of high-pressure, intermediate pressure, and low-pressure steam that drives the steam turbine generator.

- 2) La Paloma Generating Plant, a 1,048-megawatt natural gas-fired, combined cycle facility located near McKittrick, Kern County and California's 11<sup>th</sup> largest power plant that provides power to approximately 700,000 homes. This power plant consists of four combustion turbine generators, four heat recovery steam generators and exhaust stacks, and four steam turbines. The plant requires approximately 5,500 acre-feet of water annually for cooling and process operations, which is supplied by the WKWD. The WKWD currently pumps water from the California Aqueduct via an eight-mile-long pipeline and pump station to the LPGP. The electric pump is currently operated exclusively with grid power. Whenever grid power is interrupted, direct pumping of water stops and LPGP has less than eight hours of operating process/cooling water stored on site.
- The Sunrise Power (SP) project, a nominal 585-megawatt ("MW") combined-cycle natural gas fired power plant configured with two General Electric Frame 7FA gas turbines that exhaust into two heat recovery steam generators ("HRSGs") located near the community of Fellows, Kern County and is served by the West Kern Water District. SP delivers electricity to the interconnection point at the PG&E Midway Substation. Exhaust gas for the combustion turbine generators for the generation of high-pressure, intermediate pressure, and low-pressure steam that drives the steam turbine generator.

The production of energy requires water; therefore drought can severely impact energy systems. Large amounts of water are required to generate steam turbine generators as well as for cooling the natural gas power generation system. Drought conditions can result in reduced plant efficiency and generation capacity and can also impact the supply chain for natural gas and biofuel. West Kern's water shortage contingency plan prioritizes water supplied to the power plants second only to residential use. The Western US so far has not experienced major power cuts or plant shutdowns due to drought. One in seven jobs in Kern County are in the Oil and Gas industry.

- Oil and gas drilling in the county could be impacted by decreasing water availability, particularly in times of drought by limiting the amount of water available for cooling, fuel extraction, and power generation. The effects of climate change and water availability on the oil and gas sector include a combination of potential direct and indirect impacts. Water is required in many different stages of the oil and gas value chain, from exploration to processing to transport, and the volume of water used in these activities varies, with the largest volume used in the refining process. A lack of water can force facilities to temporarily shut down.
- Large Landscape/Golf courses: Buena Vista Golf Course is an 18-hole public golf course in Kern County, California. It is located near Dustin Acres, approximately 20 miles west of Bakersfield. It is one of three courses owned and managed by the County of Kern Parks &

Recreation Division. The course is 6,710 yards on hilly terrain and opened in 1951. The course has views of the Buena Vista Aquatic Recreation Area (which consist of two artificial lakes), farmland, and mountains. This public golf course has been a long time recreational and dining location for 70 years and agreed to reduce watering to their fairways.

Industrial water accounts for about 75% of the water use in WKWD, so this sector could be significantly impacted.

### **Quantified and Documented Impacts**

#### **Public health concerns or social concerns associated with current or potential conditions (e.g., water quality concerns including past or potential violations of drinking water standards, increased risk of wildfire, or past or potential shortages of drinking water supplies?)**

According to the Centers for Disease Control and Prevention (CDC), severe drought conditions can also negatively affect air quality. During droughts, there is an increased risk for wildfires and dust storms. Particulate matter suspended in the air from these events can irritate the bronchial passages and lungs. This can make chronic respiratory illnesses worse and increase the risk for respiratory infections like bronchitis and pneumonia. Some drought-related health effects are experienced in the short-term and can be directly observed and measured.

However, the slow rise or chronic nature of drought can result in longer term, indirect health implications that are not always easy to anticipate or monitor. The public health and social concerns associated with drought conditions include the following: 1) Compromised quantity and quality of drinking water, 2) Loss of outdoor recreational facilities, 3) Effects on air quality, 4) Diminished living conditions related to energy, air quality, and sanitation and hygiene, 5) Compromised food and nutrition, and 6) Increased incidence of illness and disease. The water supply from the SWP is the most vulnerable because of the high demand and the ongoing drought and the potential for more severe and recurring droughts brought on by climate change.

Local supply of groundwater that is reliable and sustainable provides the best alternative in case water supplies from the SWP are interrupted, which the Project helps to achieve.

#### **Does the community have another water source available to them if their water service is interrupted?).**

No, the rural communities and industries served by West Kern do not have access to another water source if their water service is interrupted.

#### **Whether there are ongoing or potential environmental impacts (e.g., impacts to endangered, threatened or candidate species or habitat).**

The service area does not include surface water supplies and West Kern is not aware of any ongoing or potential environmental impacts caused by drought.

Social Impacts: Social impacts of drought are ways that drought affects people's health and safety. Social impacts include public safety, health, and conflicts over water supplies.

Kern County is currently experiencing conflicts over water supplies for people versus agricultural and environmental purposes. Small farms have been unable to secure the permits necessary to drill agricultural wells and have experienced wells going dry forcing farmers to buy water from other farmers or water purveyors.

Declining aquifer levels are raising concentrations of contaminants in groundwater in the shallow strata of the aquifer, necessitating wellhead treatment---a social, health and financial impact.

- Economic losses lead to increased anxiety or depression.
- Health problems related to low water flows and poor water quality.
- Health problems related to dust.
- Threat to public safety from an increased number of forest and range fires
- Reduced incomes.
- People may have to move from farms into cities.
- Fewer recreational activities.

**Local or economic losses associated with current water conditions that are ongoing, occurred in the past, or could occur in the future.**

The West Kern service area industries have not specifically experienced economic losses due to drought thus far, due to its decades of groundwater recharge of the subbasin. However, West Kern did not anticipate the loss of function of this well just 10 years after being placed in service. If grant funds are not secured, the burden of the cost to replace this well estimated at approximately \$3.5 million, which will be a significant economic burden to the district that will require rates be increased to replace this infrastructure. A rate increase for this disadvantaged community may be a significant financial burden for many of the residential customers in this community.

Economic Impacts

The economic impacts of declining groundwater supplies caused by drought have a regional impact beyond the service area of West Kern, because multiple entities and communities rely on and draw water from the San Joaquin Valley Groundwater Basin.

A few different types of economic impacts to the Kern County area that relies on groundwater:

*Agriculture:* Kern County is the fourth most productive agricultural county in California and relies on imported water supplies to maintain its economy. Crops grown in Kern County are consumed throughout the United States and are exported to countries around the world including Africa, Australia, Canada, China, Japan, Mexico and countries in Central America, South America, Europe, the Middle East and Southeast Asia. Kern County agriculture grossed \$4.7 billion in 2010. Kern County's top five commodities in gross income are, in order: Grapes, Almonds, Pistachios, Milk and Citrus. Together they make up \$2.8 billion or 60 percent of the total gross value of Kern County agriculture.

*Electric Energy Generation:* Approximately 2 gigawatt of electrical power generation occurs

within the district. This amounts to 4.4% of the total state's peak power demands. According to Vista Watt's System Summary Report (which is generated from PG&E statements), well NW-1 solar generated 1,021,790 kWh in 2022 with a value of \$364,629 based on last year's A6 rates. This year NW-1 solar has generated 510,662 kWh valued at \$199,418 and based upon the previous A6 rate. The PG&E NEMM Meter is tied to the NW1 solar array for generation and Well NW-1 for consumption. The value of unused energy at NW-1 is estimated at over \$564,000 using the previous A6 rate.

*Oil Production: 70,000 barrels per day oil production.*

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

West Kern, the Kern Water Bank, and the Kern County Water Agency have been cooperatively recharging the groundwater basin for several decades. Since 1978, more than 3.4 million AF of water has been recovered for use. While other regions have experienced conflicts, our region has worked cooperatively and will continue to work cooperatively to provide a sustainable water supply for the region.

**1.4.4. Evaluation Criterion D—Presidential and DOI Priorities**

**Describe, in detail, how the proposed project supports a priority(ies) below.**

The Climate Change & Economic Justice Screening tool was used to identify the climate and economic vulnerabilities for the communities served by West Kern. Data from the mapping tool were added as layers to the district service area maps to create a map depicting Low Income and Wildfire Risk. Portions of the service area are also identified as linguistically isolated.

**Disadvantaged or Underserved Communities**

It is a priority of the Biden-Harris Administration and the Department of Interior to provide safe, reliable drinking water to disadvantaged communities. Approximately 99 percent of the population living within the West Kern service area are identified as low income and approximately 70 percent are Hispanic.

Disadvantaged communities are often burdened with multiple disadvantages and the West Kern communities are representative of this circumstance. The residents of these communities experience a mix of vulnerabilities at varying degrees including, low income, high wildfire risk, expected building loss, water quality concerns from living near oil fields, former military base activities, linguistic isolation, limited educational attainment, fine particulate pollution (PM 2.5), moderate to high ozone levels, and pesticides. See attachment 1c: Disadvantaged Community Map for a graphical representation.

**Describe how the proposed project will serve or benefit a disadvantaged or underserved community, identified using the tool described above.**

In 2020, West Kern had an estimated population of 22,172 and served water to 7,379 homes, businesses, and industrial facilities. The area served by the water district is considered a



Disadvantaged Community and 100 percent of the community served will benefit from the completion of the proposed project.

### **Economic and Workforce Benefits**

Kern County has been declared the energy capital of California. The region is one of the top oil-producing counties in the U.S. and generates more than 50 percent of the state’s renewable energy. The nation’s largest wind and geothermal facilities as well as the second-largest solar field call Kern County home. Kern County has been declared the energy capital of California. At the November 2021 Kern County Energy Summit, which showcased the region’s incredibly diverse energy portfolio, Taft Mayor Dave Noerr aptly and succinctly stated that a just transformation is actually an integration and that the proper and responsible integration of emerging technology opportunities, along with legacy opportunities, will power us into the future. Chevron has significant investments in green hydrogen and RNG technologies and California Resources Corporation has applied for permits for two initial permanent Carbon Capture and Storage projects in Kern County (Chapman, 2022).

West Kern Water District provides the water that support these industries in the west Kern County area including those located in the City of Taft.

### **Tribal Benefits**

- **Does the proposed project directly serve and/or benefit a Tribe?**
- **Does the proposed project support Reclamation’s Tribal trust responsibilities or a Reclamation activity with a Tribe?**

The project will not involve a Tribe or Tribal lands and will not directly benefit a Tribe.

### **1.4.5. Evaluation Criterion E—Readiness to Proceed and Project Implementation**

#### **Engineering or design work performed specifically in support of the proposed project.**

Design has not begun but is anticipated to be similar to the construction of well NW-2. West Kern will utilize a video log and as-built construction drawings from well NW-2 to assist with the design of the replacement well. The 2011 Environmental Impact Report and Addendum completed when the wells were originally designed is anticipated to be sufficient to address the environmental review requirement and will be provided to USBR upon request for NEPA compliance.

Reclamation also has completed an Environmental Assessment for the groundwater recharge and recovery project area (Bureau of Reclamation, May 2013).

#### **Describe any land purchases that must occur before the project can be implemented.**

No land acquisition or easements are required to complete this project.

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

No new policies or administrative actions required to implement this project.

**Describe the implementation plan of the proposed project.**

The project scope of work is detailed in the project description section of the application. The project design will be completed using a consultant and is expected to be similar to the design of Well NW-2 located within the same well field. Construction bids will be solicited using a competitive bidding process and it is anticipated that two different construction contracts will be executed, as noted in the estimated schedule below.

Task No.	Milestone/Task/Activity*	Planned Start Date	Planned Completion Date
1	Project Management	April 2024	December 2025
2	Engineering Design	April 2024	September 2024
3	Environmental Compliance-Exemption	April 2024	June 2024
4	Well Drilling Bid Administration	August 2024	October 2024
5	Well Drilling Construction	November 2024	February 2025
6	Well Equipping Bid Administration	February 2025	April 2025
7	Well Equipping Construction	May 2025	September 2026

\*Assuming a grant award notification in April 2024.

**Describe any permits or approvals that will be required.**

Permit	Agency	Status	Estimated Approval Date
Well Drilling Permit	Kern County Environmental Health	TBD	August 2024
Dust Control Permit	San Joaquin Valley Air Pollution Control District	TBD	January 2025
Drinking Water Permit Amendment	State Water Resources Control Board	TBD	September 2026

**1.4.6. Evaluation Criterion F—Nexus to Reclamation**

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

Not applicable

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

West Kern has a banking program with Kern Tulare Water District (KTWD) who is a Central Valley Project (CVP) contractor. Through this USBR approved program, West Kern stores wet year surplus water in its existing water banking facilities. The stored water is then recovered and returned to Kern Tulare in dry years when CVP water is not available. The maximum quantity of CVP water that KTWD would have available in storage in the West Kern groundwater bank for recovery is 20,000 AF.

The source of KTWD's CVP water is from KTWD's CVP CV contract (including the Assignment from Rag Gulch Water District), purchases, and/or transfers and exchanges of CVP water from other CVP contractors whose contract supplies carry RRA full-cost pricing provisions. The point of CVP water delivery from KTWD to WKWD is Buena Vista Turnout No. 2 on the California Aqueduct.

Water is returned to KTWD by existing recover wells located at the groundwater banking facilities and KTWD has first priority (first rights) to recover up to 2,000 AFY and second priority to up to an additional 1,000 AFY from West Kern. Additional recovery capacity would be as a second priority to the existing West Kern obligations (Bureau of Reclamation, 2013)

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

The proposed project would allow the district to continue to operate this mutually beneficial program with Kern Tulare Water District. The West Kern groundwater banking facilities and KTWD's services are entirely located within the CVP place of use.

**Is the applicant a Tribe?**

The applicant is not a Tribe.

**1.4.7. Evaluation Criterion G—Stakeholder Support for Proposed Project**

The following stakeholders have provided letters of support (see attachment 8) for the project:

- *Kern County Water Agency:* The agency participates in a wide scope of water management activities, including water quality, flood control and groundwater operations to preserve and enhance Kern County's water supply. The Agency supports this project because of the benefit it provides to ensuring water supply reliability.
- *City of Taft:* The City receives water from West Kern to serve its rural population of approximately 8,700. The City supports the replacement well project because it enhances water supply reliability for the region and the residents of Taft.
- *Kern Water Bank Authority (KWBA):* KWBA is a joint powers authority that operates the Kern Water Bank with recharge basins adjacent to the project site; with adjacent recharge and recovery sites. The KWBA JPA members include the Dudley Ridge Water District, Kern County Water Agency, Semitropic Water Storage District, Tejon-Castac Water District, Westside Mutual Water Company, and Wheeler Ridge-Maricopa Water Storage District. West Kern and the Kern Water Bank share commitments to the sustainability and resiliency of the Kern County Subbasin. As an adjacent partner that share the commitments to the recharge, resiliency, and sustainability of the aquifer, they support West Kern's deep well project.

## 2. PROJECT BUDGET

### 2.1. Summary of Funding Sources

Table 2-1: Summary of Non-Federal and Federal Funding Sources

Funding Sources	Funding Amount
<b>Non-Federal Entities: West Kern Water District</b>	\$ 1,776,354
<b>Non-Federal Subtotal</b>	\$ 1,776,354
<b>Requested Reclamation Funding</b>	\$ 1,776,354

### 2.2. Budget Narrative

The USBR Budget Narrative Spreadsheet is included as attachment 5 to this application and submitted via the Grants.gov workspace. The preliminary engineer's estimate for construction is included as Attachment 6.

## 3. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

**Will the proposed project impact the surrounding environment (e.g., soil [dust], air, water [quality and quantity], animal habitat)? Please briefly describe all earth-disturbing work and any work that will affect the air, water, or animal habitat in the project area. Please also explain the impacts of such work on the surrounding environment and any steps that could be taken to minimize the impacts.**

The West Kern Water District Replacement Well and Treatment Project (Project) consists of constructing a new deep aquifer well with treatment. This new well will replace the existing NW Well #1 that was damaged because of the drought.

The well will be constructed in an existing wellfield adjacent to the inactive NW Well #1 to a depth of approximately 1,000 feet below ground surface (bgs). Groundwater recovered at this Project site from the production wells would be pumped to West Kern's Pump Station A.

The proposed construction and operation of the deep aquifer recovery well would occur within the designated recharge and recovery area located approximately 1.5 miles southwest of the Stockdale Highway interchange with I-5. The rectangular shaped Project area ranges in elevation from approximately 290 to 293 feet above mean sea level. The site is relatively flat and has been graded for surface irrigation with a very gentle slope towards the northwest. The nearest natural surface water body to the Project site is the Kern River flood channel which is located approximately 1.5 miles south. The project site (well field) has four (4) operational aquifer recovery production wells extracting water from 550 gbs and one (1) wells extracting water from the deeper strata of the aquifer, 1,000' bgs.

The construction of the proposed project will involve earthwork activities that would expose soil to the effects of wind and rain. Implementation of Storm Water Pollution Prevention Plans (SWPPPs) as required by the National Pollution Discharge Elimination System (NPDES) program

for the proposed project and other related projects greater than one acre would minimize the potential for impacting water quality. Therefore, the proposed project's contribution to construction-related and operational water quality impacts would not be cumulatively considerable. This new well may be pumped at a maximum operational rate of 3000 gpm, however it will likely be operated at 2,000 gpm.

**Are you aware of any species listed or proposed to be listed as a Federal threatened or endangered species, or designated critical habitat in the project area? If so, would they be affected by any activities associated with the proposed project?**

The mammals, reptiles and the special-status bird species listed below known to occur or potentially occurring in the vicinity of the project will not be affected by any activities associated with the proposed project.

**Mammals:** San Joaquin kit fox, Tipton kangaroo rat, giant kangaroo rat, San Joaquin antelope squirrel, Tulare grasshopper mouse, San Joaquin pocket mouse and the American badger.

**Reptile:** Blunt-nosed leopard lizard

**Birds:** Burrowing owl, White-tailed kite and Swainson's hawk, California condor and the Loggerhead shrike.

These species were identified by reviewing a search of the California Natural Diversity Database and staff experience and knowledge of sensitive flora and fauna of the southern San Joaquin Valley in the preparation of the 2010 Groundwater Banking Project Environmental Impact Report and Addendum No. 2 (2011).

Their level of significance after mitigation was less than significant for all.

**Are there wetlands or other surface waters inside the project boundaries that potentially fall under CWA jurisdiction as "Waters of the United States?" If so, please describe and estimate any impacts the proposed project may have. When was the water delivery system constructed?**

The project will not impact any wetlands or other CWA jurisdictional surface waters.

**Will the proposed project result in any modification of or effects to, individual features of an irrigation system (e.g., headgates, canals, or flumes)? If so, state when those features were constructed and describe the nature and timing of any extensive alterations or modifications to those features completed previously.**

Not applicable.

**Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places?**

No, there are not any buildings, structures, or features listed or eligible for listing on the National Register of Historic Places.

**Are there any known archeological sites in the proposed project area?**

There are no known archeological sites in the proposed locations. The construction of five (5) other wells (including the now inactive well) were drilled without uncovering any archeological sites or cultural resources; therefore, it is anticipated that this project will not impact any archeological sites.

**Will the proposed project have a disproportionately high and adverse effect on low income or minority populations?**

No, this project will not have a disproportionately high and adverse effect on low income or minority populations. West Kern serves a disadvantaged community; therefore, this project will benefit a community that will be adversely impacted should the project not be completed.

**Will the proposed project limit access to and ceremonial use of Indian sacred sites or result in other impacts on Tribal lands?**

No, this project will not limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands.

**Will the proposed project contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area?**

West Kern has developed and implemented a Recharge Site Maintenance Plan for the entire property that outlines weed control measures and implementation schedules to ensure weeds and unwanted vegetation are controlled. The Plan describes actions to maintain each portion of the site including the recharge berms, excavated stockpile area, roadways and easements, and other areas including cultivated land. The level of significance after mitigation was less than significant.

West Kern will also be responsible for the maintenance of all Project facilities for the duration of the Project. Weed and pest control operations will be conducted as necessary to protect against nonnative noxious weeds. Periodic earthwork operations will be required to maintain berms, enhance soil permeability, and remove vegetative growth. Infrequent access within the pipeline easement for maintenance will also be necessary.

**4. OVERLAP OR DUPLICATION OF EFFORT STATEMENT**

There is no overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities costs or commitment of key personnel. West Kern has not submitted a grant application seeking financial assistance from any other state or federal agency that would be duplicative of the funding requested from Reclamation.

**5. CONFLICT OF INTEREST DISCLOSURE STATEMENT**

The West Kern Water District is not aware of any potential conflict of interest associated with this funding request or for the proposed project.

## 6. OFFICIAL RESOLUTION

The official resolution was executed on October 24, 2024 authorizing the general manager to submit grant applications and execute an agreement with Reclamation for the implementation of the proposed project. The resolution agrees to use the funds identified in this funding plan for the proposed project. The adopted resolution is enclosed as Attachment 2.

## 7. UNIQUE ENTITY IDENTIFIER (UEI) AND SYSTEM FOR AWARD MANGEMENT (SAM)

The Sam.gov Registration status is active with an expiration date of December 14, 2023. The West Kern Water District will continue to update and maintain an active registration status. The verification of the registration status is included in Attachment 7.

## 8. REFERENCES

(Listed alphabetically)

Bureau of Reclamation Mid Pacific Region. (2013, May) *Final Environmental Assessment Kern-Tulare Water District/West Kern Water District Groundwater Banking Project*. (EA 11-071). U.S. Department of the Interior.

Bureau of Reclamation. (2021, March). *Sacramento and San Joaquin River Basins SECURE Water Act Section 9503(c) Report to Congress*. U.S. Department of the Interior.

California Department of Water Resources. (2021, September). *Water Year 2021: An Extreme Year*. California Natural Resources Agency. [Water Year 2021: An Extreme Year \(ca.gov\)](#) , accessed 10/1/2023.

Chapman, Richard. "Community Voices: Kern's energy industry continues to power the region's economic growth," *The Bakersfield California* news article. February 20, 2022. [Community Voices: Kern's energy industry continues to power the region's economic growth | Community Voices | bakersfield.com](#) , accessed 11/5/2023.

Dee Jaspar and Associates, Inc. (2010, March). *West Kern Feasibility Study Report, 480-Acre Groundwater Banking Project*.

ESA. (2010, March). *Final Groundwater Banking Project Environmental Impact Report*. West Kern Water District.

Provost and Pritchard Consulting Group. (2023, January) *Urban Water Management Plan (revised)*, West Kern Water District.

Richard Slade and Associates, LLC. (2023, August) *Technical Memorandum Key Items from the Construction & Testing of WKWD North Wellfield Well NW-2*.



## **ATTACHMENT 8**

### **LETTERS OF SUPPORT**

- **Kern County Water Agency**
- **City of Taft**
- **Kern Water Bank Authority**



October 27, 2023

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

West Kern Water District  
800 Kern Street  
Taft, CA 93268

Ms. Karen Schubert  
Department of the Interior  
Bureau of Reclamation, Water Resources and  
Planning Office

Re: West Kern Water District's 2024 WaterSMART Drought Response  
Program Application: Deep Well Replacement Project

Dear Ms. Schubert,

The Kern County Water Agency (Agency) is writing in support of West Kern Water District's (West Kern) grant application to the USBR 2024 WaterSMART Drought Response Program: Drought Resiliency Projects. West Kern is proposing to construct a deep well in its North Well Field, an area that provides groundwater recharge, storage, and recovery capacity. The Agency is the State Water Project (SWP) contractor for the region and directly contracts with West Kern for its imported SWP supply. West Kern balances its groundwater pumping by replenishing the groundwater basin with the imported SWP water that is stored, recovered, and delivered to customers. As climate change and drought conditions impact the availability of local and statewide water, projects like West Kern's proposed deep well project, that enhance accessibility and resiliency to supplies, are increasingly important. Constructing the well at a depth that is less susceptible to damage and dewatering when groundwater levels fluctuate will help ensure reliable access to West Kern's water supply and increase resiliency to drought.

The Agency was created in 1961 by a special act of the California State Legislature and serves as the local contracting entity for the SWP. The Agency participates in a wide scope of water management activities, including water quality, flood control and groundwater operations to preserve and enhance Kern County's water supply. The Agency works to improve groundwater levels and to monitor groundwater quality throughout Kern County, especially in the areas surrounding groundwater banking projects.

Phone No. (661) 634-1400

Mailing Address  
3200 Rio Mirada Drive  
Bakersfield, CA 93308

West Kern Water District and Department of the Interior Bureau of Reclamation, Water Resources and Planning Office

Re: West Kern Water District's 2024 WaterSMART Drought Response Program Application: Deep Well Replacement Project

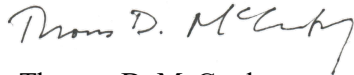
October 27, 2023

Page 2 of 2

The Agency supports this project because of the benefits it provides to ensuring water supply reliability. The deep well will help access water supply during drought conditions. West Kern is a partner in maintaining the sustainability of the groundwater basin and funding from the U.S. Bureau of Reclamation will enable West Kern to increase drought resiliency.

If you have any further questions, please feel free to contact Michelle Anderson at 634-1400 or [manderson@kewa.com](mailto:manderson@kewa.com)

Sincerely,



Thomas D. McCarthy  
General Manager



West Kern Water District  
800 Kern Street  
Taft, CA 93268

Karen Shubert  
Department of the Interior  
Bureau of Reclamation, Water Resources and  
Planning Office

**West Kern Water District's 2024 WaterSMART Drought Response Program Application: Deep Well Replacement Project**

Dear Ms. Schubert,

The City of Taft is writing in support of West Kern Water District's grant application to the USBR 2024 WaterSMART Drought Response Program: Drought Resiliency Projects. West Kern is proposing to construct a deep well in its North Well Field, an area that provides groundwater recharge, storage, and recovery capacity. West Kern receives imported water from the State Water Project that is used to replenish the groundwater basin and recovered by wells and delivered to customers. West Kern provides water to the City of Taft, in addition to the City of Maricopa and other disadvantaged communities in its service area. Constructing the well at a depth of up to 1,000 feet below ground surface will ensure reliable access to water supply and increase resiliency to drought.

The City of Taft is located in Kern County within the San Joaquin Valley. Our population is approximately 8,700. The climate is semi-arid and the area, similar to other parts of California, is subject to extreme drought. The drought from 2020 to 2022 is now considered the driest three-year period on record going back to 1896. During this period, all 58 counties were under a drought emergency proclamation. Locally, this drought caused aquifer levels to decline, irreparably damaging one of the district's wells. The well failed and was taken offline. To prevent this from happening again, West Kern proposes the replacement of this well at a depth that is more resilient to the impacts of drought, which will help ensure reliable access to water supply.

The City of Taft supports this project because of the benefits it provides to enhancing water supply reliability. It supports our priorities to collaborate with local water suppliers to comprehensively plan for a sustainable water supply, as well as to protect the quantity and quality of groundwater resources. Funding from the Bureau of Reclamation will enhance West Kern Water District's ability to manage and access its water supplies and increase drought resiliency.

If you have any further questions, please feel free to contact me at (661) 763-1222 EXT 10.

Sincerely,



Craig Jones, City Manager

ADMINISTRATION • FINANCE • PLANNING • PUBLIC WORKS

209 E. KERN STREET • TAFT, CA 93268  
Phone 661/763-1222 • Fax 661/765-2480

[www.cityoftaft.org](http://www.cityoftaft.org)

# KERN WATER BANK AUTHORITY

October 16, 2023

Karen Shubert  
Department of the Interior  
Bureau of Reclamation, Water Resources and  
Planning Office

## **West Kern Water District's 2024 WaterSMART Drought Response Program Application: Deep Well Replacement Project**

Dear Ms. Schubert,

The Kern Water Bank Authority is writing in support of West Kern Water District's grant application to the USBR 2024 WaterSMART Drought Response Program: Drought Resiliency Projects. West Kern is proposing to construct a deep well in its North Well Field, an area that provides groundwater recharge, storage, and recovery capacity. Kern Water Bank Authority is a Joint Powers Authority that operates the Kern Water Bank and is a neighboring agency of West Kern Water District with recharge basins adjacent to the project site. The Kern Water Bank recharges surface water supplies and acts as a drought reserve for its member entities. With adjacent recharge and recovery sites, West Kern and the Kern Water Bank share commitments to the sustainability and resiliency of the Kern County Subbasin.

The Kern Water Bank is located in California's southern San Joaquin Valley, southwest of the city of Bakersfield. It occupies about 20,600 acres and contains about 8,800 acres of recharge ponds. The Kern Water Bank was developed in response to wide fluctuations in California surface water supplies. It conserves surface water that becomes available in wet years in a groundwater aquifer and later recovers the banked supplies. It is an effective water storage project designed to enhance groundwater resources, to supplement inconsistent surface water supplies, and provide a more stable, reliable and sustainable source of water particularly in dry years. As climate change, such as rising temperatures and changing precipitation patterns impact surface water availability, groundwater storage, recharge, and recovery are critical to reliable water supply and managing resources in our region.

West Kern Water District's deep well replacement project will provide more reliable access to water supply for its customers, increasing resiliency to drought. With adjacent water facilities, both West Kern and the Kern Water Bank observed the impact the 2020-2022 drought had on declining aquifer levels. As an adjacent partner that shares commitments to the recharge, resiliency, and sustainability of the aquifer, we support West Kern's deep well project.

If you have any further questions, please feel free to contact me at 661-241-6443 or [jparker@kwb.org](mailto:jparker@kwb.org).

Sincerely,  
Kern Water Bank Authority,



Jonathan Parker  
General Manager

cc: West Kern Water District



# KERN WATER BANK AUTHORITY

October 16, 2023

Karen Shubert  
Department of the Interior  
Bureau of Reclamation, Water Resources and  
Planning Office

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The Kern Water Bank Authority is writing in support of West Kern Water District's grant application to the USBR 2024 WaterSMART Drought Response Program: Drought Resiliency Projects. West Kern is proposing to construct a deep well in its North Well Field, an area that provides groundwater recharge, storage, and recovery capacity. Kern Water Bank Authority is a Joint Powers Authority that operates the Kern Water Bank and is a neighboring agency of West Kern Water District with recharge basins adjacent to the project site. The Kern Water Bank recharges surface water supplies and acts as a drought reserve for its member entities. With adjacent recharge and recovery sites, West Kern and the Kern Water Bank share commitments to the sustainability and resiliency of the Kern County Subbasin.

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If you have any further questions, please feel free to contact me at 661-241-6443 or [jparker@kwb.org](mailto:jparker@kwb.org).

Sincerely,  
Kern Water Bank Authority,



Jonathan Parker  
General Manager

cc: West Kern Water District