application for the

WaterSMART:
Water and Energy Efficiency Grants for FY 2022
FOA: R22AS00023

City of Fresno
Smart Irrigation Timers Direct Install Project

Prepared For:
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November 3, 2021

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1.A Executive Summary

Date:	November 3, 2021
Applicant Name:	City of Fresno - Department of Public Utilities
City, County, State:	Fresno, Fresno County, CA
Application:	**Category A – Funding Group 1**

The City of Fresno, located in the Central San Joaquin Valley of California, seeks to increase the efficient use of water for residential irrigation by purchasing, installing, and programming 1,500 EPA WaterSense® labeled Smart Irrigation Timers for the City of Fresno – Department of Public Utilities' residential customers. Proposed controllers use soil type, plant type, and irrigation system type programmable input to customize each resident's water use to prevent over-watering and water loss. The Smart Irrigation Timers also receive local weather data to help prevent watering on days of precipitation and adjust to seasonal changes to prevent overwatering and runoff. Based on previous installations of Smart Irrigation Timers at single-family residential properties within Fresno between 2018 and 2019 as part of a City rebate program, it is estimated that installation of Smart Irrigation Timers through the proposed project will result in an average savings of 78,204 gallons, or 0.24 AFY of potable water *per year for each customer*. With 1,500 Smart Irrigation Timers installed at the close of the project, this equates to a savings of 360 AFY of potable water. This project will also conserve an estimated 138,031 kWh per year resulting from less energy used for pumping groundwater and treatment of surface water as a result of the potable water savings. For over a decade, California has experienced below average rain fall, culminating in drought that continues to impact the state of California, including the San Joaquin Valley. The City currently manages its water supply by maximizing surface water for potable use and intentional groundwater recharge during wet and normal years, while relying on groundwater during dry years. The City's ongoing supply management is intended to maximize local supplies and improve the groundwater basin storage. Current actions to support these efforts include intentional groundwater recharge using conservation programs. Implementation of the Smart Irrigation Timers Direct Install Project is a conservation program that will assist in protecting the City's vulnerable potable water supplies due to over pumping and prolonged drought by decreasing the amount of potable water being used for residential landscape irrigation, allowing conserved water to remain in the water supply system.

Project Start Date, Duration and Estimated Completion Date

The performance period for this project is two years, with a start date of July 1, 2022. Project planning, including marketing and preparation of customer applications, and purchasing of supplies and materials is scheduled to begin August 2022. Installation activities will begin October 2022 with an estimated completion date of June 2024.

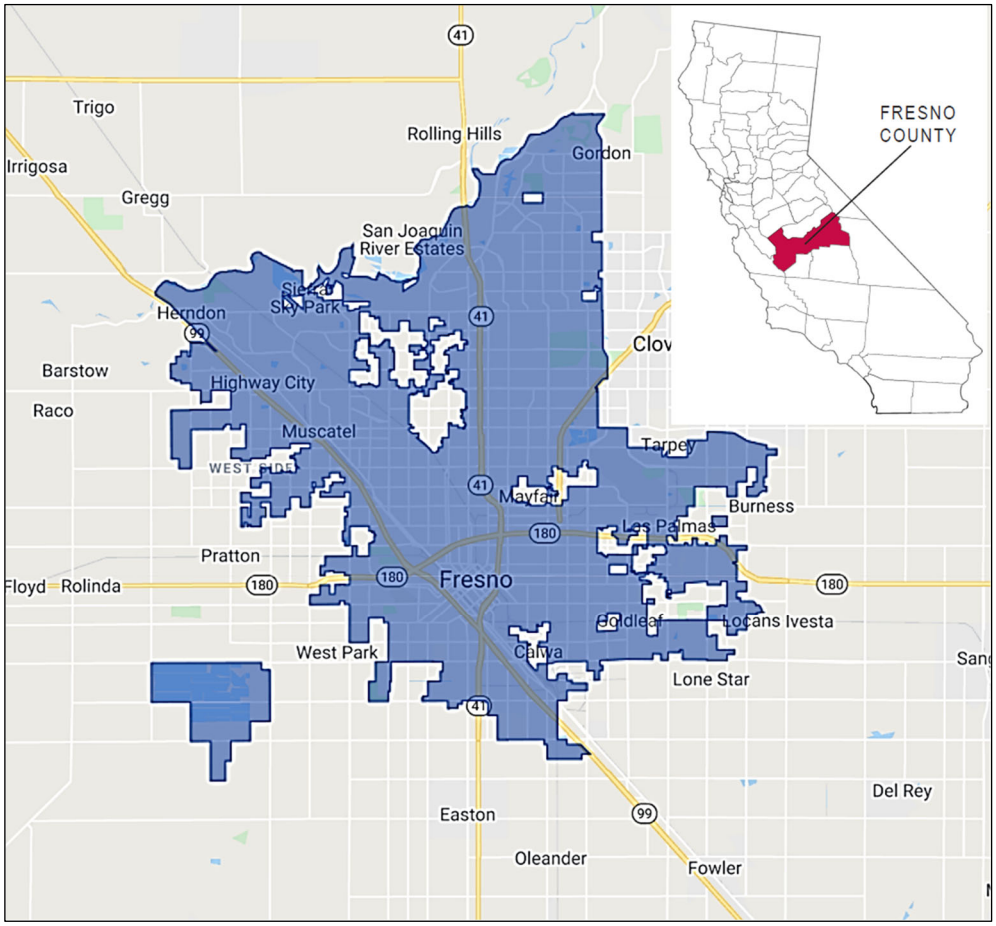
Federal Facility

The proposed project is not located on a Federal Facility.

1.B. Project Location

The project is located in the County of Fresno in Fresno, California. Residents who will receive Smart Irrigation Timers and installation and programming services will be determined through an application process that will distribute timers equitably across the City's seven Council districts, and thus will not be limited to one specific area of the City. The project latitude is 36° 44' 51.83" North, and the project longitude is 119° 46' 20.53" West. The City of Fresno (population 546,770 as of January 2021), incorporated in 1885, is in the Central San Joaquin Valley of California, approximately 170 miles south of the City of Sacramento, and 220 miles north of the City of Los Angeles. Fresno is the fifth largest city in California and encompasses nearly 110 square miles. Fresno is bounded on the northwest by the San Joaquin River, approximately 10 miles downstream of Friant Dam, and is approximately 13 miles west of the Kings River. A map of the project location is included as **Exhibit 1**.

Exhibit 1:
Location of Fresno, Fresno County, CA



Source : https://koordinates.com/layer/96890-city-of-fresno-ca-city-limits/

1.C. Technical Project Description

City of Fresno Water Sources

The City of Fresno (City) relies on four sources of water for its customers, including groundwater from the North Kings Subbasin (approximately 45%); surface water from the Central Valley Project (CVP) through a contract with the United States Bureau of Reclamation (Reclamation – approximately 17%); surface water from the Kings River through a contract with the Fresno Irrigation District (FID – approximately 37.5%); and recycled water (approximately 0.5%). In 2020, single-family residential use of potable water was 60,065 acre feet per year (AFY) and accounted for nearly 50% of total potable water use in the City.

Fresno's water resources are strained because of historical and ongoing drought and over pumping of the North Kings Subbasin groundwater system. Most recently, drought conditions in the San Joaquin Valley that began in May 2021 resulted in smaller deliveries of surface water from the CVP and FID contracts. The City's population continues to grow steadily each year, with an increase of 8.58% in a ten-year period, and a projected steady population growth of approximately 1.1% to 2.1% over the next 36 years (City of Fresno, Urban Water Management Plan (UWMP), 2020). As the fifth largest City in the State of California, this is a considerable increase in population. As a result of strained water resources and expected future growth, the City must continue to innovate and find new ways to conserve water to meet current and future demands.

Current Residential Clock Irrigation Timers

Currently, the majority of City DPU residential customers use clock irrigation timers for their irrigation schedules. An example of a clock irrigation timer is shown in **Exhibit 2**. According to DPU employees, clock irrigation timers currently in use by customers can be up to 50 years old. The use of clock irrigation timers can lead to several problems. First, clock irrigation timers are not user friendly. Programming the timers is not straightforward, and often leads to customer errors when attempting to input watering schedules. Additionally, many of the oldest clock timers do not have battery backups for when power is lost. If power is lost, these timers lose the programmed schedule for watering. For those that do have battery backups, many customers are not aware of this, and thus programming is lost during power disruptions if the

Exhibit 2:
Example of a Clock Irrigation Timer

Source: City of Fresno DPU Staff Photo

batteries are dead. When power is lost, customers need to reset the programming which can lead to errors. Additionally, clock timers have "faces" that can be easily manipulated or accidentally bumped which results in a change to the original programming. Finally, clock irrigation timers do not allow for input of site-specific characteristics, including plant and soil type, nor do they account for weather conditions. All of these factors contribute to improper irrigation and loss of potable water.

Pilot Test of Smart Irrigation Timers

In 2018 and 2019, the City's DPU – Water Conservation Program (WCP) began offering rebates to residential customers who purchased Environmental Protection Agency (EPA) WaterSense® labeled Smart Irrigation Timers (hereinafter, Smart Irrigation Timers). A Smart Irrigation Timer that is WaterSense® labeled is a timer that meets EPA criteria. According to the EPA, "To earn the WaterSense® label, Smart Irrigation Timers are independently certified to meet specific WaterSense® criteria for efficiency and performance. Smart Irrigation Timers that use either weather or soil moisture data can be labeled under those respective specifications. Some controllers use both types of data concurrently, and those must be certified under both specifications to bear the WaterSense® label." WaterSense® labeled timers are "Smart", as all have a system of built-in water saving features including a sensor to adjust to the optimal sprinkler run time based on local weather conditions.

Between 2018 and 2019, 144 customers took part in the rebate program by replacing standard clock irrigation timers with WaterSense® labeled Smart Irrigation Timers. According to the EPA, switching to Smart Irrigation Timers can save an average home 50% of its previous water use. Data has been compiled from customers who took part in the rebate to derive at estimated AFY water savings. A total of 50 residences that received the Smart Irrigation Timers through the rebate program were included in the analysis. The remaining 94 customers were not included in the analysis due to one of the following variables that would skew actual realized savings: change in ownership, change by owner of initial programming by DPU staff, or detected leaks. The data indicates an average water savings of approximately 78,204 gallons per year per household since installation, equaling 0.24 AFY of water saved per household. Smart Irrigation Timers use local weather conditions and landscape characteristics, including soil and plant types among others, to tailor watering schedules to actual conditions at each site, instead of irrigating using a standard controller with a clock and a preset schedule. These features allow watering schedules to better match plants' water needs, thus saving water that would otherwise be lost to evaporation, wind, or runoff. Additionally, since Smart Irrigation Timers are cloud-based, programming is not lost even during power disruptions.

Because of the success of the rebate program, the City's DPU proposes to purchase 1,500 Smart Irrigation Timers to further increase potable water conservation. It is estimated that the City will conserve 360 AFY (average of 0.24 AFY/household x 1,500 timers to be installed) of potable water through the implementation of this project. Completion of the project will require several steps, as follows:

Marketing and Promotion of the Smart Irrigation Timer Direct Install Project

The City will use a contracted marketing consultant to assist with a campaign to alert all DPU customers of the availability of free Smart Irrigation Timers, including installation and programming services to be performed by Fresno DPU staff. Methods will include a utility bill insert, promotion through social media, and information on a dedicated page on the City's website. Inserts will be issued to all residential customers one time per year over two years, starting in October 2022. Inserts will also be included for customers who receive notices of violation for their water use. Boosted social media posts will be included on the City's Facebook, Instagram and Twitter accounts twice per year in spring and fall. An announcement and program information will also be posted to the City's DPU Water Conservation Program homepage, as well as through a press release. All marketing materials will be issued in English, Hmong, and Spanish, and will be ADA compliant for printed materials.

Purchase Smart Irrigation Timer Kits

The City will purchase a 50-50 mix of two types of Smart Irrigation Timer kits for a total of 1,500 kits, as follows: 750 kits of the Orbit Brand B-Hyve Model #57985, and 750 kits of the Rachio 3e Model #8ZULWC-L. Kits include mounting materials, power cords, and instructions. The kits will be purchased on a quarterly basis over the course of the project to accommodate limited storage space. **Exhibits 3 and 4** are pictures of the proposed Smart Irrigation Timers to be purchased. A discussion of the specifications of each system follows.

Exhibit 3:
Orbit Brand B-Hyve Smart Irrigation Timer

Source : https://www.homedepot.com/p/Orbit-B-hyve-XR-8-Zone-Smart-Sprinkler-Controller-57985/

- **Orbit B-Hyve Model #57985**: The Orbit B-Hyve kit comes with the B-Hyve Smart Irrigation Timer, a 54-inch power supply cord, mounting hardware, and a quick start guide. This system is Wi-Fi enabled, allowing users to control their watering system from a smart phone, tablet, or computer. Users can program up to eight different watering zones.

This product uses WeatherSense™ technology, which allows it to receive local weather data and make adjustments based on forecasted precipitation events. Programming for irrigation scheduling can be done using the smart watering program, through manual input, or a combination, and has the capability to integrate catch cup measurements for even greater watering precision. The program gives real time updates to users when watering is completed, if watering is delayed due to site or weather conditions, and sends alerts if the controller has lost its Wi-Fi connection. The Orbit B-Hyve app is compatible with iPhone, iPad, and iPad Touch with iOS 13.5 or higher, and with Android version 5.0 or higher. It is also compatible with Smart Home features including Amazon Alexa and Google Home. It has Bluetooth capability and a minimum of 2.4 GHz of Wi-Fi bandwidth. The Orbit B-Hyve also supports most rain and freeze sensors, and is EPA WaterSense® labeled.

Exhibit 4:
Rachio Brand 3e Smart Irrigation Timer

Source : https://www.homedepot.com/p/Rachio-R3e-8-Zone-Smart-Sprinkler-Controller-8ZULWC-L/

- **Rachio 3e Model #8ZULWC-L**: The Rachio 3e comes with the 3e Smart Irrigation Timer, a 6-foot power supply cord, mounting hardware, and a quick start guide. This system Wi-Fi enabled, allowing users to control their watering system from a smart phone, tablet, or computer. Users can program up to eight different watering zones. This product uses Weather Intelligence™ which automatically skips unnecessary watering due to rain, wind, freeze, saturation, and seasonal shifts. It comes with a Smart Cycle feature, which assists in preventing runoff by staggering watering times to allow infiltration. Each watering zone can be customized by soil and plant type, as well as sun exposure, slope, and type of spray head. The Rachio 3e is compatible with iOS 10.3+ and Android 4.4+, and can integrate with Smart home features including Amazon Alexa, Google Assistant, Nest, IFTTT, Wink, Control4 and Nexia. This model is also EPA WaterSense® labeled.

Create Project Database and Establish Application System

- **Database:** A project database will be created in Microsoft Excel using multiple tabs that will contain the following information:
  1. *Information for Selected Residents*
     a. Address and contact name
     b. Audit information about irrigation system
     c. Installation date and notes
     d. Which timer installed and programming specifics (soil type, plant type, irrigation days assigned)
  2. *Water Savings Data*
     a. Baseline irrigation usage in gallons per day
     b. Post-installation water usage for irrigation
  3. *Marketing Efforts and Outputs*
     a. Number and dates of bill inserts
     b. Number and dates of social media posts
     c. Questions received from residents (log showing date, questions asked, and resident name)
     d. Date(s) of press releases
     e. Date of program opening

- **Application System:** City staff will establish an application system by developing an online application, as well as a dedicated project webpage on the City's Water Conservation Program website. Applications will be found on this dedicated webpage. City staff will also develop a program description, the requirements to apply, and a description of the application procedures. City staff will develop a written process/protocol for reviewing and selecting applications, alerting selected residents, scheduling installations, and required post-installation reporting to the project database.

  Customers who are interested in receiving a Smart Irrigation Timer will need to have Wi-Fi available and use of a Smart phone, tablet, or computer. All interested customers must confirm that they have Wi-Fi and may be required to purchase signal boosters so that the Wi-Fi signal can reach the timers. Applications will be reviewed by the DPU Water Conservation team and approved on a first-come, first-served basis for households that meet the Wi-Fi requirements. Timers will be distributed equitably across the City's seven Council districts.

Schedule Installation and Programming Appointments

A team of three Fresno DPU Landscape Water Conservation Specialists (DPU Specialist) will schedule site visits with accepted applicants and coordinate the installation. Installation will begin within 2 weeks following the marketing promotion and availability of customer applications.

Install and Program Timers

The DPU Specialist will perform installation and programming of the Smart Irrigation Timers. Installation will involve the following steps:

1. Unplug the current irrigation timer from its power source.
2. Remove timer box cover to expose the control panel.
3. Take a picture or label wire configurations.
4. Disconnect valve wires and ground/common wires.
5. Unscrew the old timer and give to the customer for reuse or disposal.
6. Direct customer to upload the Smart Irrigation Timer app on their phone, tablet or computer.
7. Install new Irrigation Smart Timer.
8. Install new molly bolts for mounting support, if needed.
9. Reconnect ground/common and valve wires by following labels or the picture taken.
10. Replace the timer box cover.
11. Plug in the new Smart Irrigation Timer.
12. Assist customer in syncing/pairing the new Smart Irrigation Timer with their device.
13. Begin programming the Smart Irrigation Timer by entering the following information for each irrigation zone:
    - Enter the zone description (for example, front lawn, shrub island, etc.).
    - Enter the "Smart" details, including soil type, vegetation type, and sprinkler type.
14. Go into the Smart program app to enter days and times for irrigation based on the City's mandated watering schedule.
15. Test-run (audit) each zone to confirm correct rewiring.
16. View the app calendar to confirm that the correct programming is applied.

Currently, the City implements a staggered outdoor watering schedule. Between April 1 and October 31, the schedule allows addresses ending in odd numbers to water on Tuesdays, Thursdays, and Saturdays, and addresses ending in even numbers to water on Wednesdays, Fridays, and Sundays. Watering is limited to before 10:00 a.m. or after 6:00 p.m. on all watering days and is prohibited to occur on Mondays for all customers. Between November 1 and March 31, the watering schedule changes to a one day a week schedule, and allows addresses ending in odd numbers to water on Saturdays, and addresses ending in even numbers to water on Sundays.

Enter Customer Information

Following installation activities, DPU Water Conservation staff will enter information in the customer database including client contact, date of installation, model of system installed, audit information, and any other pertinent information. Copies of the audits performed during installation activities will also be kept on file at the DPU Water Conservation office by staff and noted in the database.

Residential Potable Water Conservation Efforts

The proposed project is supported by several other DPU residential potable water conservation programs to promote conservation and reduce demand. These measures help reduce overdraft

of the North Kings Subbasin. With completion of a single-family, residential Advanced Metering Infrastructure (AMI) project in 2012, the City is able to monitor residential water use more closely, which has led to reducing water consumption by approximately 13% since 2013. Other conservation efforts launched by the City include the "EyeOnWater" tool, various rebate incentives, and free services and consultations. The "EyeOnWater" tool
customers to connect to their water utility accounts and view their latest water usage which helps customers understand their use, detect leaks, and discover their watering trends. The City offers a variety of rebates to qualified customers to offset some of the costs of installing water-efficient appliances, fixtures, and landscaping materials. Free services and consultations are provided to help customers save money by reducing their water use and ensuring compliance with water conservation regulations. These free services and consultations include a water-wise landscape consultation, irrigation efficiency audit, irrigation controller assistance, and water leak surveys.

1.D. Evaluation Criteria

Evaluation Criterion A: Quantifiable Water Savings (28 points)

Amount of Estimated Water Savings

The estimated amount of water expected to be conserved as a direct result of this project is 360 AFY of potable water. This equates to a single household savings averaging 0.24 AFY, or over 78,204 gallons per year.

Current Losses

According to the EPA, approximately 50% of water used in residential landscape irrigation is wasted. Losses generally occur due to evaporation, wind, and runoff, with 30-50% being evaporation, and potentially higher percentages lost to evaporation in arid climates such as Central California. Water not lost to evaporation or wind either infiltrates the ground and returns to the aquifer, or becomes surface runoff that enters storm water infrastructure. In the City of Fresno, the storm water system is under the purview of the Fresno Metropolitan Flood Control District. According to DPU staff, the amount of water infiltration when overwatering in Fresno is likely minimal owing to the predominance of clay loam soils found throughout most residential yards within the City. Clay loam soils can only take in approximately ¼" of water in a one-hour time frame. Standard sprinkler (fixed spray) systems distribute about ¼" of water in five minutes. On average, homeowners typically program a minimum of 10 minutes of run time per valve, leading to overwatering and runoff. In Fresno, i
lawns has the potential to run down streets via curb gutters and into storm drains. The runoff flows through pipes into regional ponding basins and either infiltrates into groundwater or discharges into creeks, canals, or the San Joaquin River. Examples of runoff from poor irrigation practices in Fresno resulting from use of clock-based irrigation timers lacking programmable input are shown in **Exhibits 5 and 6**.

With residential irrigation water lost as runoff, the resultant discharge into surrounding surface water bodies is not ideal in an urban and suburban setting such as Fresno. Irrigation water that becomes surface water runoff in residential urban and suburban settings picks up contaminants such as fertilizers, petroleum products, soil, bacteria, and other pollutants that adversely impact surrounding water resources. Due to the amount of water loss associated with current irrigation practices and its potential to carry additional pollutants to the regional groundwater and surface water systems, there are no known benefits associated with these losses. Based on data collected from the 2018-2019 Smart Irrigation Timer rebate program, it is believed that 0.24 AFY of irrigation water per household is lost to runoff, evaporation, and wind as a result of improper irrigation practices.

Exhibit 6:
Irrigation Water as Surface Runoff, Fresno

Source: City of Fresno, DPU Staff Photos

Documentation of Estimated Savings

- **Annual Water Savings Estimates:** Documentation of estimated annual water savings is based on data collected from the Smart Irrigation Timer rebate program between 2018 and 2019. A total of 144 customers took part in that rebate program by replacing standard clock irrigation timers with WaterSense® labeled Smart Irrigation Timers. A total of 50 residences that received the Smart Irrigation Timers through the rebate program were included in the analysis. The remaining 94 customers were not included in the analysis due to one of the following variables that would skew actual realized savings: change in ownership, change by owner of initial programming by DPU staff, or detected leaks. These 50 residences had an average savings of 0.24 AFY per household following installation of the Smart Irrigation Timers.

- **Historical Water Consumption Data:** Each of the 50 residences used for data analysis included comparing total irrigation water use of the year prior to, and the year following, Smart Irrigation Timer installation to derive at average annual water savings per household. Furthermore rrigation use only at each residence can be calculated by taking the difference between water use on irrigation days (which are assigned) and non-irrigation days. The annual savings for each of the 50 households was then added and divided by 50 to derive at an estimated AFY savings per household. The data indicates an average water savings of 0.24 AFY of water saved per household following Smart Irrigation Timer installation. Based on this average, an estimated savings of 360 AFY at project conclusion is expected, as given in the calculation below:

  Average household savings = 0.24 AFY
  Number of households being served by the proposed project = 1,500
  1,500 x 0.24 AFY per year = 360 AFY

  This project is estimated to ***conserve*** a total of approximately 0.3% of the City's annual water supply, calculated as follows:

  Annual water supply usage (actual – UWMP, 2020): 121,993 AFY

  $$\frac{360 \text{ AFY}}{121{,}993 \text{ AFY}} = \mathbf{0.3\%}$$

- **Weather Adjustments:** The above data includes weather adjustments. EPA labeled WaterSense® Smart Irrigation Timers, such as those installed during the 2018-2019 rebate program, have

- **Devices to be Installed:** The City will install a total of 1,500 EPA WaterSense® Certified Smart Irrigation Timers. The City anticipates purchasing 750 (50% of the total of timers purchased) of Orbit Brand B-Hyve Model #57985. The remaining 750 Smart Irrigation Timers (the remaining 50%) to be purchased will be Rachio Brand 3e Model #8ZULWC-L. Pictures of these models are shown on pages 5 and 6 as Exhibits 3 and 4. These brands and models were chosen for the following reasons:

  1. The City did not want to promote one specific company or product.
  2. Both models are the same size, of comparable price, and are similar in installation and programmable capability.
  3. Both models are "faceless" so that customers cannot easily disrupt or change the initial programming performed by DPU staff during installation.

4. Both models can be mounted either indoors or outdoors, allowing for customer preference and differences in where each customer has previously mounted their irrigation timers.

- **Rebate vs. Direct Install Program:** The proposed project is a **direct-install program** as described under the project's technical description on page 8. The proposed project will also provide removal of the old clock irrigation timers, as well as programming of the new Smart Irrigation Timers. Both the Smart Irrigation Timers and the installation and programming activities will be free to residents that participate in the program.

- **Site Audits:** Site audits will be performed during each installation. Audit forms are filled out for each zone of irrigation programmed by DPU Water Conservation staff to confirm that each has been properly programmed with site variables and assigned irrigation times and days. One copy is given to the customer as a reference guide to the programming, and the other copy is kept on file at the DPU Water Conservation office in the event that a customer calls and needs assistance with re-programming their Smart Irrigation Timer. According to DPU staff, about 90% of customer problems related to irrigation timer programming can be resolved with a phone call, adding to the efficiency of these systems.

- **Verification of Water Savings:** The City will determine actual water savings by reviewing monthly water usage and status reports across the life of the project. Irrigation use at each residence can be calculated by taking the difference between water use on irrigation and non-irrigation days. The City will determine usage rates based on AMI data along with the aforementioned calculation and water bills to determine the actual amount of water that is used and conserved post-installation of the Smart Irrigation Timers. This will provide the City with an accurate account of water savings that can be attributed to the Smart Irrigation Timers Direct Install Project.

Evaluation Criterion B – Renewable Energy: Subcriterion B.2 – Increasing Energy Efficiency in Water Management (10 points)

Energy Efficiencies Expected

According to the Natural Resources Defense Council, (NRDC), about 4% of power generation nationwide is used for water supply and treatment. However, in certain parts of the United States, that number is far higher. In California, the water sector is the largest energy user in the state, estimated to account for 19% of the total electricity consumed. Reducing water consumption saves energy because less water needs to be treated and pumped to end users. By reducing water consumption, this project has the potential to increase overall energy efficiency within the City through the following avenues:

1.) Reduce energy consumption associated with pumping/boosting groundwater into the water distribution system, and;
2.) Reduce energy consumption associated with treating water.

Current Pumping Requirements

The City of Fresno currently pumps groundwater into the system using

The average pump size among the wells in use is 135 hp, serving a minimum of 50 PSI to customers. The City's computer system that operates the well array determines cost efficiency data. If a pump goes down, the system determines the least expensive pump to fulfill demand. When demand is met or exceeded, the system takes the most expensive pump offline first. The City also has three booster pump facilities.

Calculation of Energy Savings

The City estimates the well pump system uses 503.1 kilowatt hours (kWh) to pump one AF of water into the system. Additionally, surface water used for potable purposes is sent to one of three surface water treatment facilities run by the City prior to delivery to customers. The City estimates that the treatment of one AF of water uses approximately 285.5 kWh. Since groundwater comprises approximately 45% and treated surface water comprises approximately 55% of the potable water delivered to City customers, we can apply these percentages to the total of 360 AFY conserved to derive a realistic estimate of total kWh per year saved. Based on these numbers, the combined energy savings from the above actions will be **138,031 kWh saved per year** as a result of the project, assuming conservation of 360 AFY, as illustrated in the calculations given below:

Energy consumed to pump 1 AF groundwater = 503.1 kWh
% of 360 AFY likely pumped: 360 AFY x 0.45 = 162 AFY

Energy consumed to treat 1 AF of surface water = 285.5 kWh
% of 360 AFY likely treated: 360 AFY x 0.55 = 198 AFY

Pumped water savings: 503.1 kWh/AF x 162 AFY = 81,502 kWh/Y
Treated water savings: 285.5 kWh/AF x 198 AFY = 56,529 kWh/Y
TOTAL kWh/Y SAVED = 81,502 + 56,529 = **138,031 kWh/Y**

Improving/Combatting the Climate Crisis

The resultant energy efficiency outcome of the proposed water conservation project will assist in combatting and offsetting the impacts of climate change through two major avenues: a reduction in CO^2 emissions, and increased water resiliency.

- **Reduction in CO^2 Emissions**: A reduction in the amount of greenhouse gas (CO^2) emissions is a direct outcome of energy saved during water conservation practices. According to the U.S. Energy Information Administration (EIA), i

would therefore result in a savings of 126,988 pounds of CO^2 emissions per year, as illustrated in the following calculation:

138,031 kWh/Y saved x 0.92 lbs. CO^2/kWh = **126,988 lbs. CO^{2}/Y**

- **Increased Water Resiliency:** Water conservation programs such as the proposed project also combat the effects of climate change by proactively making water resources more resilient to those changes. Conserving water helps reduce the risks associated with extreme weather events resulting from climate change, including droughts and floods, which result in water resources being polluted, depleted, and unpredictable.

  When energy use is reduced, even more water is saved because less water is needed in the operation of power plants. According to the U.S. Geological Survey, electric power generators are the largest source of water withdrawal in the United States, accounting for about 40% of total water withdrawals. Additionally, cooling water is required at thermoelectric power plants for cooling and condensing steam used to run steam turbines. Estimates from 2017 indicate that the total volume of water used by thermoelectric plants in the U.S. was greater than twice the volume that flows over Niagara Falls every year (https://www.eia.gov/todayinenergy/detail.php?id=37453). Therefore, the energy savings resulting from the proposed project will result in conserving even more water by reducing the amount of water needed for energy generation.

Energy Savings Origin

Energy savings will be realized both within the City and at Fresno's "upstream" energy providers as a result of the proposed project. As previously discussed, energy savings within the City will be a result of less water pumped and treated. Energy savings upstream will be a result of less energy needed to be supplied to the City. Any offset to the amount of water used, including the conserved water resulting from the proposed project, will assist in combatting the effects of climate change by conserving both water and energy resources within the City of Fresno as well as at "upstream" energy providers.

Evaluation Criterion C – Sustainability Benefits (20 points)

Enhancing Drought Resiliency

- **Ecological Resiliency:** The proposed project improves ecological resiliency to climate change through water conservation efforts. Climate change can make it challenging for communities to provide adequate drinking water and to protect water quality. As drought becomes more persistent in the western United States, the impetus is upon communities to find ways to stretch their water resources even further. This project will assist in those efforts by conserving approximately 360 AFY of potable water, which will bolster the quantity and quality of water resources available to the City in the face of climate change.

- **Additional Water Remaining in System:** Through implementation of this project, approximately 360 AFY more potable water will remain in the groundwater and/or surface water supply system each year. This additional water will assist the City in keeping a greater amount of recharge water in the strained North King's Subbasin aquifer for future use during extreme drought events, and when surface water supply deliveries, especially critical to ecosystems sustained along the San Joaquin River and downstream, are diminished during dry years. This additional water will assist in stabilizing or increasing groundwater levels in the Kings Subbasin aquifer.

- **Project Benefit for Species:** The proposed project has the potential to benefit several endangered and threatened species located in the San Joaquin River valley north and west of the City. Fresno's stormwater is initially sent via curb gutters and storm sewer drains to urban detention basins that provide quiescent conditions allowing for settling out of suspended solids, and is then discharged to the San Joaquin River. As previously described, over-irrigation practices lead to urban runoff which can pick up a variety of contaminants. Eventually, these contaminants make their way to the San Joaquin River and other tributaries thereby threatening the aquatic habitat as well as the wildlife that rely on the San Joaquin River resources. Threatened and endangered species located along the San Joaquin River upland and wetland ecosystems nearest to the City of Fresno include the following (IPaC: Explore Location resources (fws.gov):

  1. Mammals
     a. San Joaquin Kit Fox, *Endangered*
     b. Fresno Kangaroo Rat, *Endangered*
  2. Reptiles
     a. Blunt-Nosed Leopard Lizard, *Endangered*
     b. Giant Garter Snake, *Threatened*
  3. Amphibians
     a. California Red Legged Frog, *Threatened*
     b. California Tiger Salamander, *Threatened*

     a. Delta Smelt, *Threatened.*

  Polluted surface waters can disrupt the entire food chain, with the potential to cause impacts in several ways, including bioaccumulation of contaminants, introduction of recalcitrant (environmentally persistent) pollutants, and eutrophication (which leads to a reduction in oxygen levels) of waters. Endangered and threatened mammals and reptiles of the region rely on the San Joaquin River for both a water source, and to support their food sources (fish, plants, and insects). The threatened amphibians and fish listed above are particularly vulnerable to water pollution as they spend most (or all) of their lives in aquatic habitats, thus having direct and prolonged exposure to pollutants that may enter the river.

  In September 1998, Region 1 of the U.S. Fish and Wildlife Service published "Recovery Plan for the Upland Species of the San Joaquin River Valley, California". Species

identified and subject to this recovery plan are the San Joaquin kit fox, Fresno kangaroo rat, and the blunt-nosed leopard lizard, all species that inhabit the San Joaquin River valley north and west of the City of Fresno. This project will support the recovery plan for these species by mitigating the volume of pollutants being introduced to the San Joaquin River system through residential irrigation runoff as a result of the conservation benefits of the project. Additionally, the proposed project supports the San Joaquin River National Wildlife Refuge Conservation Plan, published in 2015 by the U.S. Fish and Wildlife Service, by improving water quality upstream of this important refuge that is home to a diverse population of wetland and upland wildlife species.

- **Other Ecosystem Benefits:** Other ecosystem benefits of this project not yet discussed include the following:

  1.) **Reduce Soil Erosion:** Reducing the amount of runoff from improper irrigation will be a direct result of this project. This can prevent degradation of soil structure and reduce soil erosion. Reduced soil erosion leads to a reduction in contaminants making their way into the surface waters of the San Joaquin Valley, thereby protecting the habitats of fish, birds, and plant life that rely on this precious resource. Reduced soil erosion also assists in keeping plants and turf healthy and more resilient to climate change.

  2.) **Support Urban Wildlife Habitat:** Properly functioning irrigation systems promote healthy plant life. Both under- and overwatering plants can result in diseased or dead turf, shrubs, flowers and trees. Healthy urban green spaces are critically important to plant, insect and animal species, particularly in times of drought and as their natural habitats shrink due to human encroachment. Providing sustainable irrigation for residential green spaces is crucial to preserving the habitats they provide. The City of Fresno is situated near the San Joaquin River that produces an abundant and diverse population of wildlife. Fresno's population of wild animals within its borders includes foxes, raccoons, opossums, squirrels, skunks, coyotes, snakes, pigeons, and geese. Properly maintained urban green spaces can help promote the survival of wildlife passing through and living within the borders of the City.

  3.) **Reduce Air Pollution/Improve Air Quality:** As noted above, properly functioning irrigation systems promote healthy plant life. Improved plant health can promote absorption of air pollutants. According to the EPA, one of the many benefits of green space includes the mitigation of air pollution (https://www.epa.gov/green-infrastructure). In the presence of heat and sunlight, nitrogen oxides and volatile organic compounds interact and create "smog," or ground level ozone. Vegetation in green space can reduce smog by reducing air temperatures and removing air pollutants. Trees, turf, and other plants reduce pollution by absorbing and filtering particulate matter. Fresno County routinely ranks among the worst counties in the nation for ozone and year-round particle pollution according to the American Lung Association's *Annual State of Air* findings. In an area characterized by long seasons of

high temperatures, such as Fresno, well managed green spaces can significantly improve air quality. Additionally, as discussed under Evaluation Criterion B, water conservation leads to decreased energy use, thus decreased air pollution associated with pumping and treating potable water used for irrigation.

4.) **Reduce Human Exposure to Hazardous Materials:** Proper irrigation methods, including controlling the amount of water administered to plants, improves overall plant health and is an important aspect of cultural gardening control. Cultural controls are practices that modify garden environments to deter the occurrence of pests and diseases (https://extension.okstate.edu/fact-sheets/earth-kind-gardening-series-cultural-control-practices.html). This can greatly reduce the need for using fertilizers, herbicides and pesticides to maintain healthy plants, which leads to decreased human exposure to these potentially hazardous substances.

- **Improved Management of Water Supply:** Implementation of this project will directly result in more efficient management of approximately 121,993 AFY (actual potable water delivery, 2020) of potable water by conserving 360 AFY. This estimate is based on the amount of water to be conserved by implementation of this project, as derived from data of actual savings observed following the 2018-2019 Smart Irrigation Timer installation rebate program discussed in Section 1.C. on page 4. This will conserve as much as 3,600 AFY over the next 10 years (360 AFY x 10 years) at a minimum (conservative estimate of useful life of Smart Irrigation Timers). One of the City's overarching goals is to reduce reliance on imported water sources and stretch limited potable water supplies. Water conservation projects are one pathway to achieve these goals. This is a key step to begin large scale water conservation measures aimed at the largest sector of potable water users in Fresno, single-family residential consumers, and will lead the way to even greater implementation of conservation programs in the future.

Specific Water Sustainability Concerns

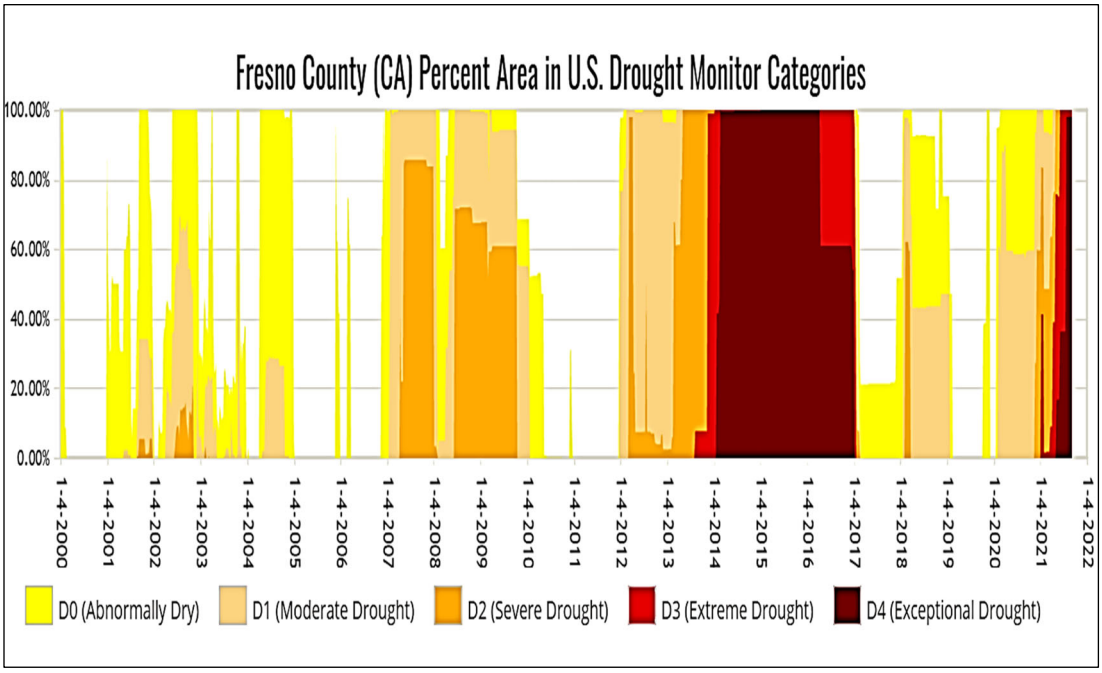
Water sustainability for the City of Fresno is threatened due to declining groundwater levels from historic over pumping of the North Kings Subbasin, prolonged drought, reduced deliveries of purchased surface water supplies, and projected increases in demand. These factors leave the water resources in the Central San Joaquin Valley extremely vulnerable. Specific sustainability issues for the City of Fresno, therefore, include the following:

- **Groundwater Vulnerability:** Groundwater withdrawal has led to two hundred feet of water level decline over the past one hundred years. This has resulted in significant subsidence and contamination of groundwater, including high levels of arsenic within the Kings Subbasin *(Smith, R., et al., Overpumping leads to California groundwater arsenic threat. Nature Comm. 9, 2089 (2018)).* Additionally, other priority contaminant plumes are located beneath the City of Fresno and are being controlled through minimum groundwater pumping to manage and prevent their spread. These contaminants include *nitrate, 1,2-dibromo-3-chloropropane (DBCP), 1,2,3-trichloropropane (1,2,3-TCP), and other volatile organic compounds like trichloroethylene (TCE)* and *perchloroethylene*

(PCE – UWMP, 2020*).* An increased demand on pumping could lead to more wells being contaminated.

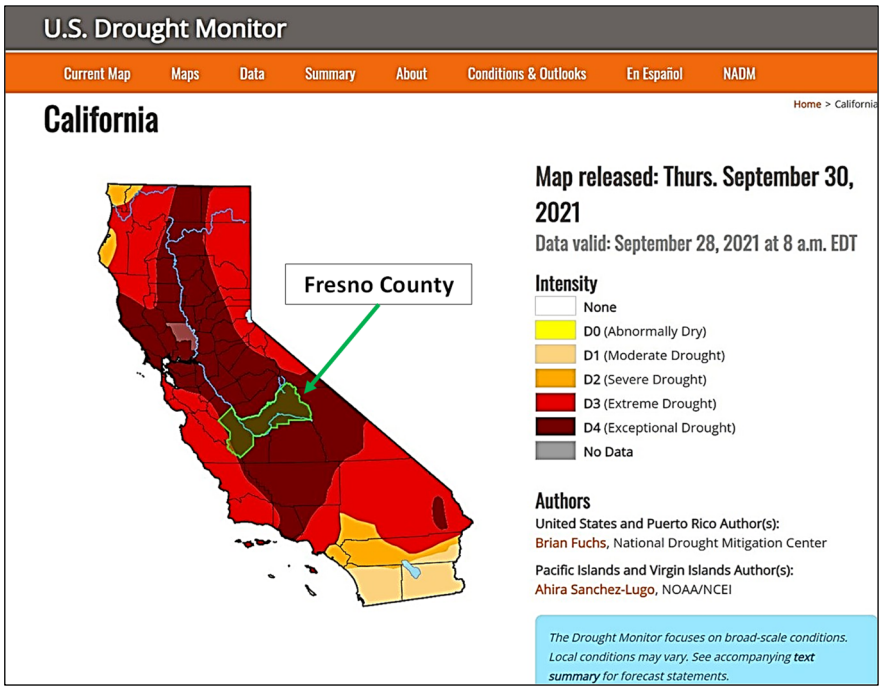
- **Ongoing and Worsening Drought:** For over a decade, California has experienced below average rain fall, culminating in drought that impacted many areas of the state, including the San Joaquin Valley. From 2012 to the present, Fresno County has been under moderate to extreme drought conditions (**Exhibit 7**). UCLA climate scientist Daniel Swain noted that in California, "increase in drought severity has been driven by several factors, including extremely low rainfall, warmer than typical historical temperatures and unusually rapid snowmelt in mountain areas. Warming temperatures, a declining snowpack and a narrowing rainy season are all hallmarks of climate change in the region."

Exhibit 7:
Historical Drought Conditions in Fresno County, CA, 2000-Present



On October 19, 2021, Governor Newsom issued a proclamation expanding a May 10, 2021, drought state of emergency proclamation from just 40% of the state (which included Fresno County) to a statewide emergency. Early warm temperatures and extremely dry soils characterized the 2021 California spring season. This depleted expected surface water runoff from the Sierra-Cascade snowpack, resulting in historic, unanticipated reductions in the volume of water flowing to major reservoirs. 2021 has been the second driest year on record, with record low storage in California's largest reservoirs. Fresno County is currently under Exceptional Drought Conditions (D4) according to the U.S. Drought Monitor as of September 30, 2021. **Exhibit 8** shows these current conditions. Drought conditions resulted in smaller deliveries of surface water from the CVP and FID contracts.

Exhibit 8:
Current Drought Conditions in Fresno County, CA
September 30, 2021



Source : https://www.drought.gov/states/California/county/Fresno

- **Increased Demand:** The population in Fresno has been growing steadily, with an increase of 8.58% in a ten-year period, and a projected steady population growth of approximately 1.1% to 2.1% over the next 36 years (UWMP, 2020). As the fifth largest City in the State of California, this is a considerable increase in population. The City of Fresno relies heavily on the groundwater basin, which accounts for 45% of its potable water supply.

How the Project Addresses Water Sustainability Concerns

This project addresses the City of Fresno's water sustainability concerns by implementing a water conservation program that will conserve 360 AFY of potable water. The project is aimed at the largest users of potable water in the City of Fresno – single-family residential customers. In 2020, single-family residential use of potable water was 60,065 AFY and accounted for nearly 50% of total potable water use in the City. The water conserved by the proposed project will result in less pumping of groundwater for potable use in dry years, and less treatment of surface water for potable use in wet years; therefore, the conserved water will either remain in the groundwater system or be available as recharge to the groundwater system. Implementing any conservation projects aimed at the largest consumers of potable water will assist in offsetting shortages resulting from drought, over pumping of the Kings Subbasin aquifer, smaller deliveries of contracted water, and increased demand. By implementing the proposed project, pressure on the strained groundwater system is eased. It will also help to buffer the effects of smaller deliveries of water from the CVP and FID contracts, and aids in greater recharge to the groundwater system for future use.

No mechanism will be needed to put the conserved water to use since it will stay in the systems from which it is normally taken (groundwater and/or surface water). 100% of the conserved 360 AFY will be used for its intended purpose, if and when it is needed.

Combatting the Climate Crisis

Implementation of this project will address and combat the impacts of climate change in the following ways:

- **Reduce Potable Water Use:** As previously described, implementation of the proposed project will save approximately 360 AFY of potable water through installation of water - efficient Smart Irrigation Timers. Potable water loss during irrigation of residential landscapes occurs due to several factors, including user error, and lack of input to account for weather conditions, soil types or saturation, plant types, and other site-specific factors such as slope, which can lead to water losses.

- **Reduce Energy Use:** By reducing water consumption by 360 AFY, this project will reduce energy consumption associated with both the pumping/boosting of groundwater into the water distribution system and treating water. As described on page 13, this project will result in an approximate energy savings of 138,031 kWh per year for the City of Fresno.

- **Increase Water Supply Resiliency to Climate Change:** Water conservation programs such as the proposed project combat the effects of climate change by proactively making our water resources more resilient to those changes. Conserving water helps reduce the risks associated with extreme weather events resulting from climate change, including droughts and floods, which result in our water resources being polluted, depleted and unpredictable. Additionally, when energy use is reduced, additional water is conserved “upstream” because less water is needed in the operation of power plants.

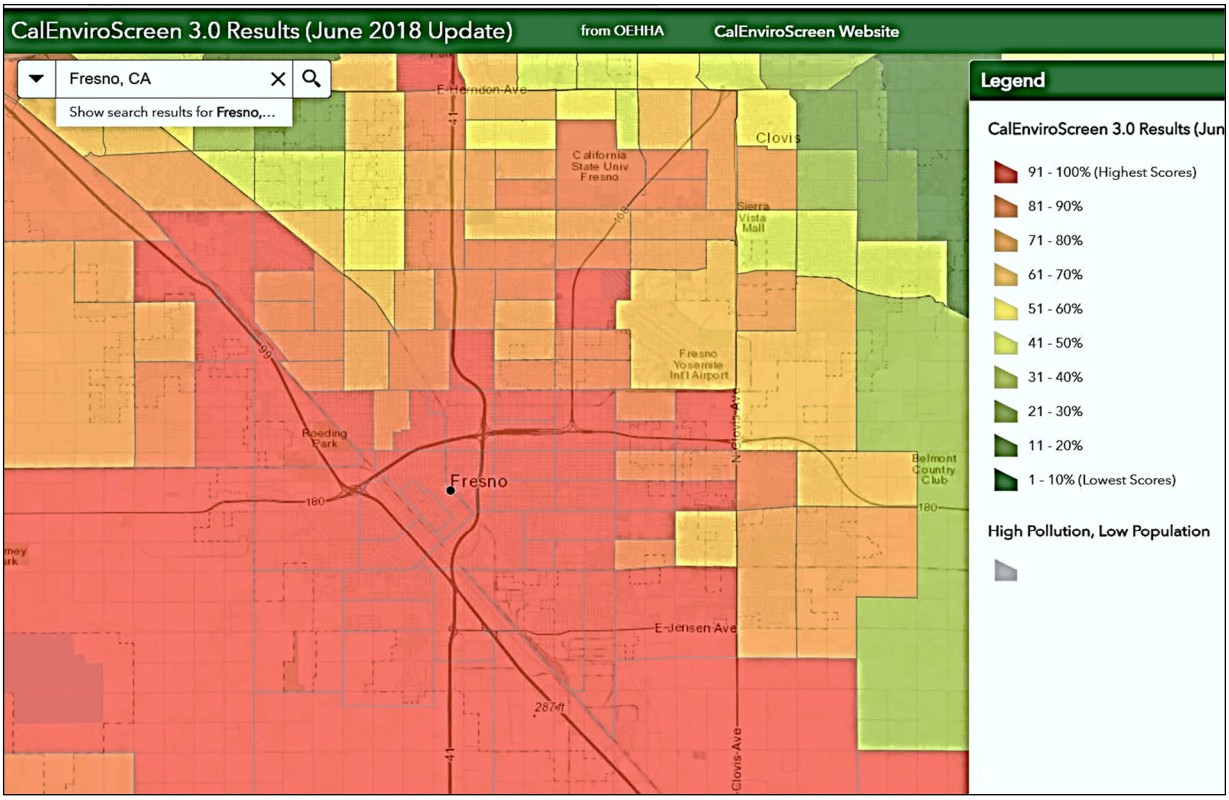
- **Reduce Greenhouse Gas Emissions**: As previously noted, a reduction in the amount of greenhouse gas emissions is a direct outcome of energy saved during water conservation practices. According to the U.S. EIA, about 0.92 pounds of CO^2 emissions are sent into our atmosphere for every kWh used. This project would therefore result in a savings of 126,988 pounds of CO^2 emissions (138,031 kWh/Y saved x 0.92 lbs. CO^2/kWh = 126,988 lbs. CO^2/Y).

Benefits to Disadvantaged or Underserved Communities

The proposed project will provide benefits to disadvantaged and underserved communities within Fresno. The project proposes to serve residential, single-family home customers within the City who requests the installation of Smart Irrigation Timers. Most of the neighborhoods within the City of Fresno are rated by the State of California as disadvantaged and underserved communities. **Exhibit 9** shows a map of the City of Fresno from

multiple sources of pollution, as well as health issues, low rates of education, and high poverty and unemployment rates (red shaded Census Tracts have the highest burden).

Exhibit 9:
Fresno Communities Burdened by Poverty and Pollution

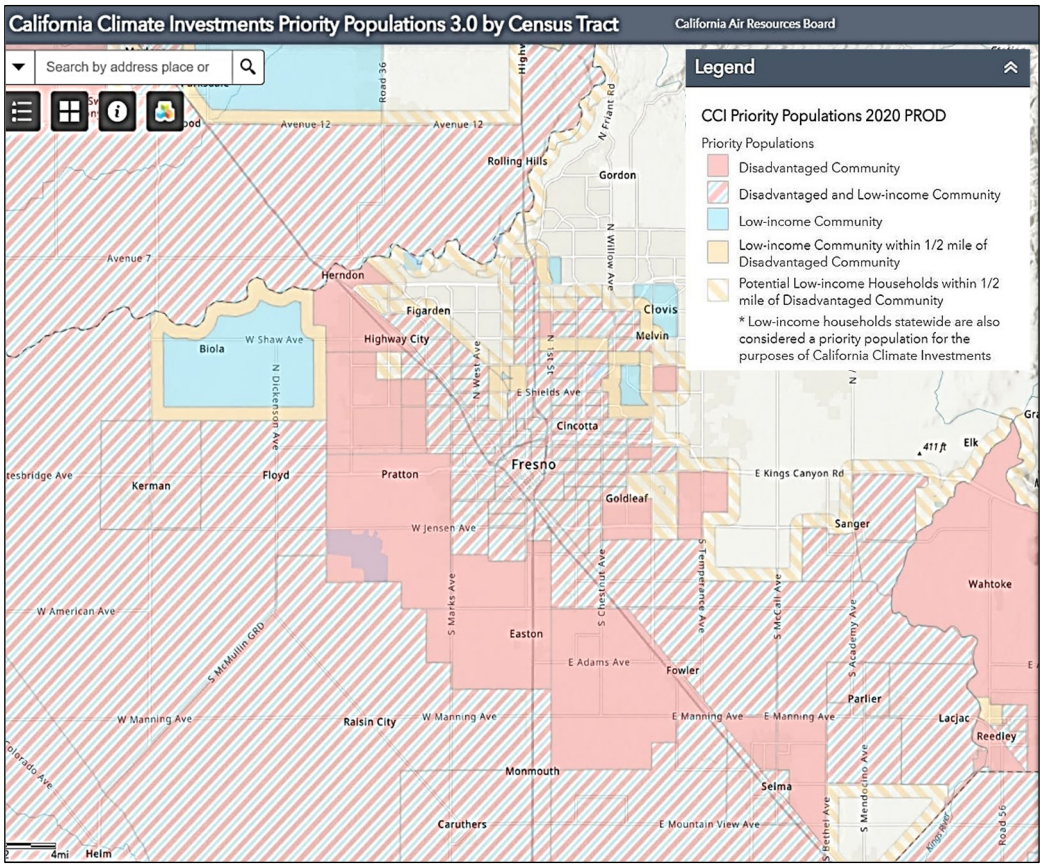


Source : https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

Exhibit 10 illustrates Fresno's ranking within the state as a "priority population" with most neighborhoods identified as disadvantaged and low-income communities. By California state definition, a disadvantaged community (DAC) and a low-income community are those whose median household income (MHI) is less than 80% than that of the statewide MHI. Disadvantaged communities are defined as the top 25% scoring areas from CalEnviroScreen along with other areas characterized by high amounts of pollution and low populations.

These communities are especially vulnerable to water insecurity. With dwindling resources resulting from drought, demand, smaller surface water deliveries, and over pumping of groundwater, the cost of residential water is driven up. Rising costs are especially harmful to populations which already sit at or below the poverty level. Any projects which look to conserve water resources within the City will assist in stabilizing costs to all consumers, even beyond those that participate in this project. Additionally, residents of disadvantaged and low-income communities may have trouble paying their water bills. Implementation of the proposed project will directly assist in immediately lowering water bills for all who participate. This project will also provide an opportunity to get water-saving technology into the homes of lower-income residents who might otherwise not be able to afford up-front costs of Smart Irrigation Timers.

Exhibit 10:
Fresno Communities Classified as Disadvantaged/Low Income



Source : https://webmaps.arb.ca.gov/PriorityPopulations/

Green spaces are important to low-income and disadvantaged communities. According to an article published by the World Resources Institute, low-income residents are more likely to be exposed to higher levels of air pollution when compared to more affluent areas, often partly because of having fewer green amenities. They are also more likely to suffer the health impacts of heat waves. Recent studies also show a correlation between higher fatality rates from COVID-19 and increased air pollution. Green space, including residential yards, can help make low-income neighborhoods less vulnerable to climate and health risks by lowering local temperatures, mitigating floods, and improving air quality (https://www.wri.org/insights/green-space-underestimated-tool-create-more-equal-cities). This project will engage customers who previously may not have used irrigation in their landscape due to prohibitive costs of water bills. Additionally, low-income residents may not have taken part in previous rebate programs due to the out-of-pocket, up-front costs of such programs. By offering free Smart Irrigation Timers that will result in more sustainable landscape irrigation at a lower cost, residents of low income and disadvantaged communities may reinvest in their green spaces which will have positive benefits for those residents socially, economically, and physically.

Tribal Benefits
Not applicable.

The proposed project will provide additional benefits not yet discussed, as follows:

- **Benefit to Other Sectors:** The San Joaquin Valley, including outlying areas of the City of Fresno, is an important agricultural production center, historically ranking as one of the highest agricultural producers in the world. This area is a national center for producing poultry, livestock, and a wide variety of crops. Agriculture, therefore, contributes significantly towards the economy of the San Joaquin Valley. Agriculture in this region depends heavily on groundwater, and ongoing drought has negatively impacted groundwater reserves because of over pumping in dry years. Adverse events in agriculture, such as drought, directly result in multiple adverse effects in the region's economy, including employment, wages, population migration, and food prices (*Impact of Drought on the San Joaquin Valley of California*; California State University, 2015). The proposed project will reduce pressure on groundwater, thereby supporting agriculture, and thus helping to protect the region's economy.

  The proposed project will also benefit City stormwater utilities by resulting in a diminished demand on infrastructure. The amount of water going into storm water systems will be reduced as a result of this project and can result in a reduction of maintenance needed. Such positive impacts can reduce or slow the rise in rates for these services. Similarly, the proposed project will result in a reduction of demand on energy utilities by reducing energy needed by the City for pumping and treatment of groundwater.

- **Benefit a Larger Initiative:** The 2014 California's Sustainable Groundwater Management Act (SGMA) is a law requiring local water utilities to balance groundwater basins by the early 2040s. Additionally, users must address negative consequences of groundwater overdraft. According to the Public Policy Institute of California, the San Joaquin Valley is "ground zero" for SGMA. This region has the largest groundwater deficit in the state and is faced with land subsidence and non-productive wells due to overdraft. The goal of the SGMA is to help the region address these issues in tandem with building climate resilience. This will require innovative work to be done by both the agricultural sector and the valley's urban water utilities. One approach to help meet the goals set forth by the SGMA is to reduce the per capita water use by residents of the communities within the San Joaquin Valley. The direct installation of Smart Irrigation Timers will effectively lower the per-capita consumption of groundwater in the City of Fresno and will support the objectives of the SGMA.

- **Prevent a Water-Related Crisis:** The City's DPU staff have noted that this year they have received numerous calls from area farmers with complaints that their water-supply wells have gone dry. As previously discussed, agriculture is a main driver for the region's economy, and groundwater resources are of critical importance to the agricultural sector. In

the face of this current crisis, any projects that help sustain and bolster the critically over drafted groundwater supply will assist in resolving this and future water-related crises.

- **Cost Savings for the City:** Implementation of the proposed project will result in a cost savings of approximately $28,526 per year to the city. As previously discussed, energy savings are estimated at a total of 138,031 kWh per year resulting from a decrease in the amount of potable water to be pumped and treated. As shown on page 13, 45% of kWhs used for one AF of water is attributable to pumping, and 55% is attributable to treatment. According to City staff, one kWh for pumping water costs on average $0.24, while one kWh for treating water costs on average $0.16. With this information, the following breakdown of cost savings for 360 AFY of potable water is given:

kWh/Y saved from reduced pumping = 81,518.4 kWh/Y
kWh/Y saved from reduced treating = 56,015.1 kWh/Y

81,518.4 kWh/Y x $0.24/kWh = $19,564/Y
56,015.1 kWh/Y x $0.16/kWh = $8,962/Y
TOTAL SAVINGS = $28,526 per year

- **Cost Savings for Customers:** The proposed project will also result in a cost savings to City residential customers. The current residential water rate is $2.33/1,000 gallons. Based on estimated savings of 0.24 AFY or 78,204 gallons per household, customers will save on average $182 per year per household ((78,204 x $2.33)/1,000). Additionally, each customer will save the cost of a Smart Irrigation Timer (between $172 and $198) as the project proposes to purchase these for 1,500 customers. As previously discussed, any projects which look to conserve water resources within the City will assist in stabilizing costs to all consumers, even beyond those that participate in this project.

Evaluation Criterion D—Complementing On-Farm Irrigation Improvements (10 points)
This criterion is not applicable to the proposed project. The target water customers for the project are single-family home residential customers within the City of Fresno. However, as detailed earlier, the proposed project will conserve approximately 360 AFY of potable water. These savings will assist in reducing pressure on regional water resources, including groundwater. The resultant conservation, therefore, supports agriculture, a sector that relies heavily on groundwater resources.

Evaluation Criterion E – Planning and Implementation (8 points)

Project Planning
During the last 10 years, the City of Fresno has prioritized water conservation programs in support of the City's overarching goal to reduce reliance on imported water sources and stretch limited potable water supplies through several major planning efforts discussed below.

- **City of Fresno - Metropolitan Water Resources Management Plan** (2011, "Metro Plan," currently being updated). The Metro Plan identifies strategies to protect water resources from foreseen and unforeseen shortages resulting from drought, population growth, groundwater over-pumping, and other factors. Chief among the Plan's objectives are recommended projects to protect the City's supply portfolio. The Metro Plan identifies water conservation measures as a priority objective to be addressed in the City's water supply plan for the future (page 3-6, Table 3-4). The plan further identifies that a water conservation component supports three of the five goals of a water supply plan to: 1.) balance groundwater use by 2025; 2.) replenish groundwater basin storage, and; 3.) continue and expand groundwater conservation (page 3-7, Table 3-5). The plan also emphasizes that the future water supply plan objectives should: "Continue to implement and expand demand management/water conservation measures in compliance with the City's USBR contract and to achieve specific water conservation goals", and "Reduce existing and future demands through more aggressive water conservation measures" (page 3-8, Table 3-6). *How Project Conforms To/Meets the Goals of the Metro Plan*: The scope of the proposed project is identified in the Metro Plan as a measure that could be used to reduce outdoor water use. Under a discussion in the Metro Plan titled "Additional Water Conservation Measures" (to reduce outdoor water use), both *Programmable Irrigation Controller Rebates* and *Weather-Based Irrigation Controller Rebates* are identified (pages 3-9 and 3-10).

  See Appendix A for selected pages from the Metro Plan which illustrate the prioritization of water conservation measures, including implementation of program objectives similar to the proposed project.

- **City of Fresno – Urban Water Management Plan and Water Shortage Contingency Plan (2020).** The Water Shortage Contingency Plan (WSCP) was prepared in conjunction with the Urban Water Management Plan (UWMP). The WSCP details how the City intends to respond to foreseeable and unforeseeable water shortages due to extended drought and/or catastrophic supply interruptions. The WSCP identifies several Demand Reduction Actions (DRAs) for the City to undertake to offset supply shortages and support the resiliency of the City's water supply portfolio. Included in these actions are water conservation efforts, including those aimed at the use of residential landscape irrigation. The City coordinated preparation of the documents with its water suppliers (including Reclamation), Fresno County, the City of Clovis, nearby water agencies, and community members. *How the Project Conforms to/Meets the Goals of the UWMP/WSCP*: The WSCP specifically identifies one DRA that aligns with the scope of the proposed project: "Provide Rebates for Landscape Irrigation Efficiency" (page 11). While the scope of this project does not involve a rebate program, it takes the idea of a rebate program one step further by offering free, directly installed landscape irrigation timers, which will result in greater landscape irrigation efficiency and conserved water.

- **Reclamation - Sacramento and San Joaquin Rivers Basin Study (2016).** The purpose of Reclamation's 2016 Sacramento and San Joaquin Rivers Basin Study ("Study") was to build on previous climate impact assessments and to meaningfully address the potential impacts of

socioeconomic and climate change in the region. The Study specifically identifies *Adaptation Portfolios,* or water management actions targeted at addressing risks identified in the study to the reliability of the Central Valley's water resources. One of the *Adaptation Portfolios* developed is **Regional Self-Reliance**, which "*is intended to include regional actions that either reduce demand or increase supply at a regional level without affecting CVP and SWP project operations. These actions include improvements in urban and agricultural water use efficiency as well as conjunctive use with increased groundwater recharge."* (p. 60).

The proposed project is aligned with the **Regional Self-Reliance** *Adaptation Portfolio* in that it focuses on improving the efficiency of urban water use through installation of Smart Irrigation Timers that will result in the conservation of 360 AFY of potable water. Additionally, by using less potable water for irrigation, the City will be able to keep more potable water in the system for groundwater recharge.

Readiness to Proceed

The City of Fresno is ready to proceed with the proposed two-year project (Funding Group 1). The Smart Irrigation Timers have been researched and selected, and the marketing consultant responsible for project promotion is a current City consultant. Each of the major tasks of this project are described in detail below.

- **Task #1 – Grant Management:** Grant management will include executing the grant agreement and all administrative work. The Project Manager will act as the Grant Administrator (assisted by the Staff Assistant), and will submit requests for reimbursements and all progress reports required under the grant agreement, as well as complete a final report and payment request.

- **Task #2 – Planning and Environmental:** The Project Manager will lead development and implementation of the customer application system, including creating a customer database and the components of the application form. The Project Manager along with assistance from the Water Conservation team will review and select customer applications. CEQA and NEPA exemption paperwork will be filed by the City at the start of the project.

- **Task #3 – Marketing:** A Fresno DPU marketing liaison will engage the City's marketing consultant to design and prepare marketing materials to promote the program. The marketing campaign will include customer bill inserts, a dedicated page on the Water Conservation Program website, and social media advertisement.

- **Task #4 – Procurement and Installation:** The Project Manager will work with the Fresno Purchasing Division to purchase the Smart Irrigation Timer kits. Purchases will be made quarterly to accommodate limited storage space. Once the purchased timers are obtained, the Project Manager will train a team of three Fresno DPU Landscape Water Conservation Specialists on installation process. Following training, installations will begin and will be completed throughout the life of the project. This will include the

installation of 750 timers during the first year over 187.5 business days to reach 50% project completion, and another 750 timers during the second year over 250 business days to reach 100% project completion. Installation is timed to begin in October 2022 when the growing season winds down and customers' irrigation activities decrease.

- **Task #5 – Monitor Performance Data:** Under this task, the Project Manager will monitor all performance data and input findings in bi-annual progress reports to Reclamation. Performance measures are discussed in detail in section 1.E. on page 31.

Exhibit 11 shows the activities and milestones for the proposed project.

Exhibit 11:
Project Implementation Plan

No.	High Level Activities/Milestones	Lead	Evaluation Technique	Dates
	Task #1: Grant Management			
1.1	Fully executed grant agreement	Reclamation/ City	Grant award executed	07/2022-07/2022
1.2	Grant administration	City	Successful audit	07/2022-06/2024
1.3	Submit request for reimbursements	City	Request for reimbursement approved by Reclamation	01/2023 07/2023 01/2024
1.4	Submit progress reports required by grant agreement	City	Progress reports submitted by City	01/2023 07/2023 01/2024
1.5	Complete final report and final payment request	City	Final report approved by Reclamation	07/2024
1.6	Records retention (3 years after final payment is made by Reclamation)	City	City to retain records for three years	07/2024-07/2027
2.1	Develop and implement customer application system	City	Database and customer application forms	08/2022-09/2022
2.2	Review and select customer applications	City	Applications on file and entered into database	10/2022-06/2024
2.3	CEQA and NEPA exemption paperwork	City	Signed and stamped paperwork	07/2022-08/2022
3.1	Marketing content development	Contractor	Signed contract on file	09/2022
3.2	Launch marketing program	Contractor	Samples of marketing materials	10/2022

No.	High Level Activities/Milestones	Lead	Evaluation Technique	Dates
3.2.1	Customer bill inserts	Contractor	Copy of insert	10/2022 and 10/2023
3.2.2	Website program information	Contractor	Screenshot of website design	10/2022-6/2024
3.2.3	Social media campaign	Contractor	Screenshot of social media ads, press release	10/2022-6/2024
	Task #4: Procurement and Installation			
4.1	Purchase Smart Irrigation Timers (quarterly purchases)	City	Contract with vendor	09/2022-06/2024
4.2	Training for installation	City	Training log that includes names, date, and topics	09/2022-10/2022
4.3	Timer installation activities	City	Proof of meter installation; database tracking	10/2022-06/2024
4.3.1	Timer installation activities **- 50% Complete**	City		07/2023
4.3.2	Timer installation activities – **100% Complete**	City		06/2024
	Task #5: Monitor Performance Data			
5.1	Collect and report 20 months of performance data (including water meter data)	City	Performance data including water meter data	11/2022-06/2024

Required Permits

The City does not anticipate that any permits will be required for the proposed project as there will be no construction activities, no ground or traffic disturbance, and all work will be carried out on private property.

New Policies/Administrative Actions

No new policies or actions are required for the proposed project. New safety protocols for staff will be developed for installation activities prior to conducting them and will be covered by the Project Manager during training sessions. Protocols will be kept on file in the DPU Water Conservation office for future use.

Evaluation Criterion F – Collaboration (6 points)

Promotion/Encouragement of Collaboration

Several entities will be involved in project implementation. DPU staff will directly collaborate with the product suppliers (Orbit and Rachio) and the City's Purchasing Division for proper purchasing protocol. DPU staff will also coordinate with the City's marketing consultant to

launch the project campaign. The City has contacted all, and each is committed to the project and helping achieve efficient implementation and robust outcomes.

The City coordinated preparation of the Water Shortage Contingency Plan (WSCP), found in 2020 UWMP, with its water suppliers (including Reclamation), Fresno County, the City of Clovis, nearby water agencies, and community members. As previously discussed under ***Evaluation Criterion E,*** page 25, the WSCP identifies several Demand Reduction Actions (DRAs) for the City to undertake to offset supply shortages and support the resiliency of the City's water supply portfolio, which includes an expansion of conservation programs. Therefore, this project is one result of the collaboration undertaken by the above stakeholders to develop the UWMP and the WSCP.

Widespread Support for the Project

Fresno City Council has indicated support of a free direct install program at several meetings over the past few years during discussions about potential water conservation projects. In discussions at regular City Council meetings, some Councilmembers have expressed a desire for easier customer access to rebate programs. They have pointed out that the customer must front the money for rebate projects, then request reimbursement after the work is complete. As one Councilmember pointed out, there are customers who are unable to afford the money out of pocket prior to applying for the associated rebate. The Smart Irrigation Timer Direct Install Project will provide an opportunity to get water-saving technology into the homes of lower-income residents who might otherwise not be able to afford the up-front costs of Smart Irrigation Timers.

Significance of Collaboration and Support

The collaboration and support for water conservation programs such as the proposed project is significant. Implementation of the proposed project will help expand DPU water customer knowledge about, and availability of, cost-efficient Smart Irrigation Timers as a way to significantly conserve water and save money. Through the marketing campaign and success of the project, widespread knowledge of and support from other DPU customers can be achieved, and will pave the way for future, expanded water conservation programs.

Likelihood of Future Water Conservation Improvements

The proposed project will serve as a further pilot study of this kind of water conservation effort providing the data and implementation expertise for the City to continue and expand the program within its boundaries to other water users, including additional residential and commercial customers.

Supporting Documents

Letters of support for this project have been received from the Central Valley Water Awareness Committee (CVWAC), Congressman Jim Costa, and Fresno County District 3 Supervisor Sal Quintero. Each letter of support indicates the relevancy of the project in meeting the goals of each entity/person regarding water resources in the Central San Joaquin Valley, as follows:

- **CVWAC:** The CVWAC is comprised of several public agencies and private companies that work together to provide portions of California's San Joaquin Valley with safe and reliable water for customers while encouraging sound water conservation practices. The goal at CVWAC is to educate residents of the San Joaquin Valley on where the water supply comes from, how it is used, and to give guidance on how to conserve water at work and at home.

- **Congressman Jim Costa:** As a member of the House Natural Resources Committee - Water, Oceans, and Wildlife Subcommittee, Congressman Costa understands the critical nature of water issues in the 16th District of California, including the San Joaquin Valley. One of Mr. Costa's top priorities is to ensure that farmers and communities have the water they need to keep the economy strong. The Smart Irrigation Timers Direct Install Project is directly aligned with his goals and objectives for the 16th District as it relates to securing water resources and making them resilient in the face of climate change and increasing demand.

- **Fresno County District 3 Supervisor Sal Quintero:** As a nearly lifelong resident of Fresno, Supervisor Quintero is aware of the issues facing Fresno's water supply as a result of growth, drought, and climate change. In 2018, the Fresno County Board of Supervisors, including Mr. Quintero, proclaimed that May of each year would be 'Water Awareness Month' in Fresno County. The campaign focuses on raising the public's awareness of water and the role water agencies play in management, water-supply, conservation, distribution, and water quality. The water conservation resulting from the proposed project aligns with one of his objectives for the District.

Letters of support are included as Appendix B.

Evaluation Criterion G – Additional Non-Federal Funding (4 points)

The total project cost is estimated at **$843,651.** The City proposes to provide non-Federal funding in excess of 50% of the project costs by providing **$464,261 or 55%** of the total project costs, and requests the remaining $379,390 or 45% to come from Reclamation. The City is prepared to meet these costs through funds appropriated from DPU Water Enterprise funds. The calculation illustrating the proposed 55% match by the City is shown below:

Non-Federal Funding: $464,261
Total Project Costs: $843,651
= 55% Matching Contribution from Fresno DPU

Evaluation Criterion H – Nexus to Reclamation (4 points)

Contract with Reclamation
The proposed project will benefit Reclamation's Central Valley Project (CVP), in which the City of Fresno is located. In the 1960s, the City secured a surface water contract with Reclamation.

The City of Fresno still contracts with the Reclamation CVP Friant Division for an annual supply of 60,000 AFY of Class 1 water under contract number 14-06-200-8910D from the Friant-Kern Canal. In wet years, surface water is treated and used as potable water, and is sent to recharge basins to recharge the Kings Subbasin. In dry years, more groundwater is pumped and used as a potable water source. The proposed project will assist in allocating more surface water towards recharge of the groundwater system or for potable water use, rather than using groundwater, and will bolster water supplies in years where the CVP Friant Division water is reduced. Additionally, the proposed project will result in less surface runoff to the water supplies within the CVP, which will enhance overall water quality.

1.E. Performance Measures

The performance measures to be used for this project include the following:

1. **AFY of Saved Potable Water:** The City of Fresno has data on current usage of potable water for all water utility customers, including residential customers through use of AMI infrastructure installed between 2008 and 2012. Data for each customer is collected daily using AMI. Data for the year prior to installation will be compared to data for the year following installation for each customer receiving a Smart Irrigation Timer to calculate water savings per household. rrigation use only at each residence can be calculated by taking the difference between water use on irrigation days (which are assigned) and non-irrigation days. This data can then be averaged and extrapolated for any remaining customers whose data cannot be included in the final report due to installation occurring later in the project timeframe.

2. **Energy Savings:** Using less potable water through implementation of this project will result in energy savings by decreasing the amount of energy needed to pump groundwater and treat surface water that will be used as potable water. Energy savings have been estimated at 138,031 kWh per year but will be calculated with submission of the final report. Initial estimates indicate a cost savings of $28,526 per year.

3. **Reduction in Amount of Water Pumped and Treated:** The City currently gets approximately 45% of its potable water-supply from the North Kings Subbasin, and about 55% of its potable water-supply from treated surface water. This project will result in a decrease in the use of approximately 360 AFY of potable water, which will decrease the amount of groundwater and surface water that the City needs to pump and treat, respectively, for potable use.

4. **Number of Smart Irrigation Timers Installed:** The City proposes to purchase and install 1,500 Smart Irrigation Timers during the life of the project (two years). The actual number of timers purchased and installed will be included in the final project report.

5. **Number of Staff Hours for Installation:** The actual total number of staff hours used for

the installation of the Smart Irrigation Timers will be tracked and reported.

6. **City Financial Savings:** Reducing residential irrigation water use through this conservation project will help offset the use of potable water by residential customers. As a result, financial savings to the City will be realized resulting from a decrease in the energy needed to run groundwater pumps and reduced treatment costs. These savings will be calculated.

7. **Customer Financial Savings:** The current residential water rate is $2.33/1,000 gallons. Based on estimated savings of 0.24 AFY or 78,204 gallons per household, customers will save on average $182 per year per household ((78,204 x $2.33)/1,000). Actual cost savings resulting from the project for residents will be calculated.

Tracking performance measures is included as Task 5.1 of Exhibit 11 presented in the ***Evaluation Criterion E – Planning and Implementation*** section on page 28.

End of Technical Proposal (must not exceed 50 pages).

2. PROJECT BUDGET

2.A. Funding Plan

The total estimated project cost is **$843,651**. The non-federal funding source match for this project will come from funds appropriated from DPU Water Enterprise funds, totaling **$464,261, or 55%** of the total project cost (see Tables 1 and 2). The remaining **$379,390 or 45%** in funding from Reclamation is needed for the City to complete full implementation of the proposed Smart Irrigation Timer Direct Install project.

The budget proposal does not include costs that have been or will be incurred prior to award. All activities are planned to begin following execution of a grant agreement with Reclamation, if awarded, which is estimated as July 1, 2022.

2.B. Budget Proposal

Table 1: Total Project Cost

SOURCE	*AMOUNT*	*% OF TOTAL COSTS*
Costs to be reimbursed with requested Federal funding	$379,390	45%
Costs to be paid by the applicant	$464,261	55%
Value of third-party contributions	$0.00	0%
TOTAL PROJECT COSTS	**$843,651**	**100%**

TABLE 2 Proposed Budget (2 YEARS)						
	Computation			Fresno Cost-Share	BOR Grant (50%)	TOTAL COST
Budget Item Description	$/Unit	Unit	Quantity (2 Yrs)		$500,000 (max)	
Salaries, Wages and Fringe						
Project Manager/Grant Administrator	$42.65	hr	700	$29,855		$29,855
3 Landscape Water Conservation Specialists (144% FTE)	$100.00	hr	3,000	$300,000		$300,000
Marketing/Webmaster Liaison	$37.98	hr	72	$2,735		$2,735
Staff Assistant	$25.29	hr	300	$7,587		$7,587
Webmaster	$46.30	hr	10	$463		$463
Programmer/Analyst	$42.16	hr	50	$2,108		$2,108
Salaries and Wages Subtotal				**$342,748**		**$342,748**
Fringe Benefits - Project Manager/Grant Administrator	$15.10	hr	700	$10,570		$10,570
Fringe Benefits - 3 Water Conservation Specialists (144% FTE)	$35.25	hr	3,000	$105,750		$105,750
Fringe Benefits - Marketing/Webmaster Liaison	$11.27	hr	72	$811		$811
Fringe Benefits - Staff Assistant	$8.94	hr	300	$2,682		$2,682
Fringe Benefits - Webmaster	$12.71	hr	10	$127		$127
Fringe Benefits - Programmer/Analyst	$11.45	hr	50	$573		$573
Fringe Benefits Subtotal				**$120,513**		**$120,513**
Supplies and Materials						
Smart Irrigation Timer - Orbit Brand B-Hyve (kits)	$198	each	750		$148,500	$148,500
Smart Irrigation Timer - Rachio Brand (kits)	$172	each	750		$129,000	$129,000
DeWalt Cordless Power Drills	$211	each	4		$844	$844
Supplies and Materials Subtotal					**$278,344**	**$278,344**
Contractual - Marketing						
Design - Logo, Campaign, Social Media Content and Bill Insert Design	$13,750	LS	1		$13,750	$13,750
Social Media Promotion	$800	LS	2		$1,600	$1,600
Account Management	$1,000	LS	1		$1,000	$1,000
Bill Insert Printing	$4,000	LS	2		$8,000	$8,000
Contractual Subtotal					**$24,350**	**$24,350**
Other/Environmental						
Environmental-CEQA/NEPA Exemption Paperwork	$ 1,000	LS	1	$1,000		$1,000
Other/Permitting-Environmental Subtotal				**$1,000**		**$1,000**
Total Direct Costs						***$766,955***
Indirect--10% De Minimum (on Total Direct Costs)	Total of Direct Costs	%	0.1		**$76,696**	**$76,696**
TOTAL PROJECT COSTS				**$464,261**	**$379,390**	**$843,651**
Percentage Contribution by Funding Source				**55%**	**45%**	**100%**

2.C. Budget Narrative

Salaries and Wages: Total salaries of $342,748 are anticipated for the proposed project. Staff required for this project are discussed below.

- **Project Manager/Grant Administrator (34% FTE)**: The Project Manager is responsible for overall project operations and management including coordinating with the City's

Purchasing Division to acquire the Smart Irrigation Timer kits and training/shadowing three Landscape Water Conservation Specialists. The Project Manager will oversee the design and implementation of the customer application process, including developing protocols, tools, and reviewing customer applications. The Project Manager serves as the primary contact with Reclamation and will be responsible for the project's budget and schedule. The Project Manager will also act as the Grant Administrator. The Grant Administrator will be responsible for managing progress reporting, payments, and invoicing associated with the grant project, as well as analyzing monthly monitoring data.

- **Landscape Water Conservation Specialist (3 – 144% FTE):** Three Landscape Water Conservation Specialists with Fresno DPU will conduct installation and programming activities, schedule site visits for installation, and assist the Project Manager by reviewing and selecting customer applications. Specialists will also undergo approximately eight hours each of training for the project. Training will cover safety protocols and proper installation and programming procedures for the Smart Irrigation Timers. In order to install 1,500 Smart Irrigation Timers within the project timeframe, Water Conservation Specialists, along with the Project Manager, will install 4 timers per day for the first 187.5 workdays (750 timer installs total). During the remaining workdays for year two (250), 3 timers will be installed per day (750 timers total), for a total of 1,500 timers at project completion.

- **Marketing/Webmaster Liaison (3% FTE):** The Marketing/Webmaster Liaison will work with the City's marketing consultant on the marketing deliverables, as well as develop content for the project's dedicated page on the DPU-Water Conservation Program website.

- **Staff Assistant (14% FTE):** The Staff Assistant will support the Project Manager by assisting with the creation of and updates to the project customer database, as well as assist with project reporting and reimbursement requests.

- **Webmaster (0.5% FTE):** The Webmaster will create the project's dedicated page on the website using input from the Marketing Liaison.

- **Programmer/Analyst (2% FTE):** The Programmer/Analyst will develop the online customer application which will reside on the project's dedicated web page.

Fringe Benefits: Fringe benefits for the staff identified above are estimated at $120,513. Proposed staff have varying rates of fringe benefits. Fringe includes costs for vacation, sick leave, employee retirement contributions, health and life insurance, disability and liability insurance, worker's compensation insurance, and costs for benefits administration.

Travel: Not applicable.

Equipment: Not applicable.

Materials and Supplies: Materials and supplies costs for the project are estimated at $278,344 and includes the purchase of the following:

- 750 Orbit Brand B-Hyve, Model #57985 Smart Irrigation Timer kits; 750 x $198 = $148,500
- 750 Rachio Brand 3e, Model #8ZULWC-L Smart Irrigation Timer kits; 750 x $172 = $129,000
- 4 cordless DeWalt power drills; 4 x $211 = $844

Power drills will be needed for removal of old clock irrigation timers, and installation of new mounting structures. Costs are escalated 20% from current rates to account for potential upgrades and chain supply issues. Costs also include 10% sales tax based on the escalated costs.

Contractual: Total contractual costs are estimated at $24,350 for project marketing and promotion to alert customers to the program. The project will utilize the services of the City's existing marketing consultant, whose services were competitively procured. Marketing costs include design costs for a logo, social media content, and bill inserts. Social media promotion costs are based on boosted social media at a cost of $400 per month, two times a year (spring and fall) for two years. Account management costs are consultant costs that include campaign planning and reporting. Printing costs for bill inserts are estimated at $4,000 per year for two years, and are based on actual costs incurred during the 2018-2019 pilot rebate program.

Third-Party In-Kind Contributions: Not applicable.

Environmental and Regulatory Compliance Costs: The project is categorically exempt from CEQA and NEPA, and a Notice of Exemption and Categorical Exclusion will be filed at a cost of $1,000. The cost for filing paperwork is an estimate from previous projects of similar size and scope.

Other Expenses: Not applicable.

Indirect Costs: Indirect costs are estimated at $76,696 and are calculated at 10% of the total direct costs, using the allowed 10% de minimum calculation.

3. ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

The City expects that the project will be designated a Categorical Exemption for California Environmental Quality Act (CEQA) and a Categorical Exclusion for National Environmental Policy Act (NEPA) as the project includes no ground disturbing activities and replacement of above-ground fixtures. Descriptions of projects that fall under CEQA Categorical Exemption and NEPA Categorical Exclusion are given below.

- **CEQA:** The City expects the project to be classified as a Class I exempted project since it consists of the "minor alteration of existing public and private structures, facilities,

mechanical equipment, etc." (Section 15301, Existing Facilities, part b). Section 15301 states that "existing facilities" includes "…publicly-owned utilities used to provide electric power, natural gas, sewage, or other public utility services."

- **NEPA:** The City expects the project to meet the definition of Categorical Exclusion: "maintenance, rehabilitation, and replacement of existing facilities…."

Based on this review, the City plans to file a Notice of Exemption and a Categorical Exclusion. The project is upgrading a component of existing infrastructure located on private (residential) property. All activities will take place above ground with no associated construction.

Impacts to the Surrounding Environment

No impacts on the surrounding environment are expected as a result of the proposed project. The project will not require traffic control since all project work will be completed within the boundaries of private property, nor will any earth-disturbing work be conducted. No materials, other than existing clock irrigation timers located on the interior or exterior of residences, will be removed. Any noise associated with project implementation will be minimal since no large equipment is being used within the scope of the proposed project.

Threatened or Endangered Species

There are **no known threatened or endangered species** associated with residential properties within the City of Fresno, all of which are urban and or suburban in nature. The City's natural resources are located primarily along the San Joaquin River, approximately eight miles north and west of the City. Owing to the year-round presence of water, the river bottom and bluffs host the richest aquatic and riparian forest biota near the City. It is in this area where migratory waterfowl and federally and state-listed endangered species are most likely to be encountered.

Wetlands or Surface Waters Inside the Project Boundary

There are **no wetlands or other surface waters** located inside the proposed project locations, all of which will be single-family residential properties.

Water Delivery System Construction Date

The original Fresno water system began operations in 1876 as a non-profit organization. Initially, the water system consisted of one pumping station composed of small pumps and two storage tanks. In 1888, the first pumping station and water tower were constructed. After ownership by several different entities, the water system was acquired by the City of Fresno in 1931 and has been operated as a municipal utility since that time. Most of the current infrastructure was constructed after the 1950's. Some portions are more than 100 years old.

Modifications of, or Effects to, an Irrigation System

No modifications will be made to city owned irrigation systems that affects features such as headgates, canals, or flumes. Modifications will be made to residential irrigation systems through the removal of clock irrigation timers and installation of the Smart Irrigation Timers.

National Register of Historic Places

There are thirty-two sites in Fresno and the immediate surrounding area, including six homes, listed in the National Register of Historic Places. Should an historic home be included in the project, the only alteration to the structure will be removal of clock irrigation timers. No alterations will be made to any historic portions of those structures (http://historicfresno.org/nrhp/nrhp.html).

Archeological sites

There are **no known archaeological sites** that will be disturbed through implementation of the project. As noted earlier, all work will be performed on private property, and will be conducted above-ground with no earth-disturbing activities.

Effect on Low income or Minority Populations

A majority of the Census Tracts within the City of Fresno where the project will take place are classified by the State of California as disadvantaged, but there will be **no disproportionately adverse effects** to these communities. In fact, these communities will benefit from the project. Low-income communities would bear a significant burden if water prices were to soar in the face of water shortages. The project is part of the City's larger plan to secure the sustainability of the City's water supplies (and thus, water prices). Additionally, customer savings will be a direct result of this project, which benefits households experiencing financial instability.

Access to Indian Sacred Sites or Impact on Tribal Lands

Residential areas of urban and suburban Fresno are **not** located on sacred sites or tribal lands. The project will be implemented on privately owned residential property and will not require disturbing the ground.

Noxious Weed or Invasive Species

The project will **not** introduce noxious weeds or invasive species. The project scope does not include any earth-moving activities; thus, no new turf or other horticultural plantings are included in the scope of work.

4. REQUIRED PERMITS AND/OR APPROVALS

The City does not anticipate that any permits or approvals will be required for this project.

5. LETTERS OF PROJECT SUPPORT

Letters of support for this project from the Central Valley Water Awareness Committee (CVWAC), Congressman Jim Costa, and Fresno County District 3 Supervisor Sal Quintero are included in Appendix B.

6. OFFICIAL RESOLUTION

An Official Resolution was brought to City Council on October 28th, 2021. A copy of the signed Resolution is included in Appendix C.