



New Washington Well

WaterSMART DROUGHT RESPONSE PROGRAM

Drought Resiliency Project Grant for FY2020

BOR-DO-20-F002- FG II

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Prepared For:

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Financial Assistance Support Section
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SECTION 1: TECHNICAL PROPOSAL

A. Executive Summary

Date: October 16, 2019

Applicant: City of Santa Ana

City/County/State: Santa Ana/Orange/CA

Project Length of Time: 26 months

Located on a Federal Facility: No

Estimated Completion Date: December 2021

Summary:

The proposed Washington Well project offers a local supply to help to build long term resilience and close the projected gap between future demand and available supply, consistent with both City of Santa Ana and Metropolitan Water District drought management policies. The great significance of the benefits of this project is reflected in the Orange County Water District's (OCWD) action to execute an agreement with the City to remove pumping limits and partially exempt the City from the Basin Equity Assessment (BEA) fees including for the proposed project. OCWD executed this Agreement with the City of Santa Ana in January 2016, recognizing the proposed project's potential to build long-term resilience to drought and reduce the need for emergency response actions. OCWD recognizes the importance of retail agencies such as the City of Santa Ana increasing the reliability of their water supplies and becoming more efficient with stressed water supplies, particularly as changes in climate continue to impact rainfall in the southern California region. In compliance with City's goals for improving drought resiliency by reducing City's reliance on imported water; the project proposes to use funding to offset the costs for the construction of the New Washington Well. The proposed Washington Well project will augment the low pressures identified in the water system analysis by pumping groundwater into the City's existing water distribution system at a strategic location. Implementation of this project will reduce City's reliance on imported water by over 4,000 AFY. In addition to adding new community benefits such as: water quality features, public pedestrian access and beautification improvements along the project site perimeter, the New Washington Well project will help to **build long-term resilience to drought and reduce the need for emergency response actions**, while offering the following benefits:

- **make additional water supplies available** by adding over 4,000 AFY to the City's pumping capacity
- **improve water management** by enhancing system flexibility
- **benefit fish, wildlife and the environment** by making the City less reliant on imported water, 4000 acre-feet yearly AFY

With a slightly more than two-year implementation schedule, the project is in progress and expected to be completed by December 2021. Not located on a Federal facility, the proposed



Washington Well Project would help support the Department of the Interior’s priorities to **“create a conservation stewardship legacy and modernize its infrastructure.”**

B. Background Data

The proposed Washington Well will be located within the City of Santa Ana — The City of Santa Ana is the second most populous city in Orange County, California, and with a population of 324,528 at the 2010 census, Santa Ana is the 57th-most populous city in the United States. According to the 2000 U.S. Census, of U.S. cities with more than 300,000 people, Santa Ana is the 4th-most densely populated behind only New York City, San Francisco, and Chicago, and slightly denser than Boston. City of Santa Ana has a service area of 27 square miles and supplies over 12.5 billion gallons of water with 44,565 meter connections to its residents that are mostly considered disadvantaged.

Founded in 1886, for many years the City was a ranching and farming community. To serve this growing agricultural and domestic community, a municipal water system was formed in 1886. In 1931, to tap into water sources from outside the area, the City joined with 12 other southern California cities to form and become an original member agency of the Metropolitan Water District of Southern California (MWD). As a regional wholesaler, MWD supplies imported water to southern California from the Colorado River and the State Water Project from Northern California which are directly influenced by climate conditions in northern California and the Colorado River Basin, respectively. Both regions have been suffering from multi-year drought conditions which directly impact water supplies to Santa Ana and southern California. MWD's primary purpose is to develop, store and distribute water at wholesale rates to its member public agencies for domestic and municipal uses.

In 1933, the Orange County Water District (OCWD) was formed by a special act of the State Legislature to manage Orange County's groundwater supply and protection of the County's rights to water in the Santa Ana River. In 1953, the City of Santa Ana became a member of OCWD.

The City of Santa Ana obtains its water supply from two primary sources. Approximately 25-30 percent of the supply (60,580 gpm) comes from seven (7) import connections, which are managed by MWD. The remaining 70-75 percent of the water supply comes from a total of 21 groundwater wells which pump from the Lower Santa Ana River Groundwater Basin (also known as the Orange County Groundwater Basin (OC Basin) which is managed by the Orange County Water District (OCWD). The OC Basin is not adjudicated; pumping is managed by OCWD through financial incentives to encourage groundwater producers (such as the City of Santa Ana) to pump a “sustainable” amount of water, as determined by the District in their Basin Pumping Percentage (BPP) goals.



Currently, 44,551 service connections are within the City’s water distribution system, all of which are metered. Approximately 66.8 percent of the City’s overall demand is residential. The remaining 33.2 percent serves commercial (52 percent of non-residential), institutional (4 percent of non-residential) and industrial (44 percent of non-residential)

Based on 2012-2013 data, the City’s most recent (2015) Urban Water Management Plan (UWMP) identifies the annual demand at 36,655 AFY. Below is a table illustrating the City’s projected water demands through the year 2040.

Table 1: Demand for Raw & Potable Water From Santa Ana’s 2015 Urban Water Management Plan

Retail: Demands for Potable and Raw Water - Projected						
Use Type	Additional Description	Projected Water Use				
		2020	2025	2030	2035	2040
Single Family		14,092	15,137	15,241	15,237	15,259
Multi-Family		10,405	11,177	11,254	11,251	11,267
Other	(CII) Comm/Instit/Indust	12,033	12,925	13,014	13,010	13,030
Landscape	Large	148	158	160	160	160
TOTAL		36,678	39,397	39,669	39,658	39,716

NOTES: Data retrieved from MWDOC Customer Class Usage Data and FY 2014-2015 Retail Tracking.

As stated in the UWMP, the **City aims to mitigate short supply (resulting from drought) by decreasing its reliance on imported water.**

The City maintains approximately 480 miles of transmission and distribution mains, nine reservoirs with a storage capacity of 49.3 million gallons, seven pumping stations, 21 wells, and seven import water connections. Thirteen of the City wells pump into surface reservoirs with booster stations pumping the water into the distribution system. The remaining wells pump directly into the City’s distribution system. Water pumped from these wells has been naturally filtered as it passes through underlying aquifers of sand, gravel, and soil. This well water only requires disinfectant treatment for system distribution.

The City maintains seven imported water connections to receive water through Metropolitan's Orange County and East Orange County Feeder pipelines. These seven metered connections transfer water into the City’s distribution system with a total capacity of 60,580 gpm.

The City of Santa Ana received a grant from the Drought Response Program of the Bureau of Reclamation in 2018 for its Well 32 Rehabilitations’ Improvements.



C. Project Description and Location

The construction of the proposed Washington Well project will address the low pressure deficiencies in the northeastern portion of the Low Zone on the south side of Interstate 5 between East 17th Street and East 1st Street, as identified in the 2017 Master Plan. Without this new well in the vicinity of the Elevated Tank, the water pressure in this area may continue to drop and could reach a level of service that is not adequate and will result in other consequences such as fire fighting capacity. In addition to improving system reliability and flexibility, the Washington Well will add pumping capacity to the city system and enhance the City's drought resiliency by reducing reliance on imported water.

Similar to the City's other wells, the Washington Well is proposed to be drilled to a depth of about 1,300 feet below ground surface and be installed with minimum of an 18-inch diameter casing. The design capacity of the well will be about 2,500 to 3,000 gpm well pump flow range; design head of about 400 to 450 feet; and the well pump will be driven by a 350 to 400 HP electric motor. Construction will include the City's typical well to system mechanical piping layout, electrical equipment (e.g. include switchgear, control panels, variable frequency drive, telemetry, lighting, programming, etc.) and well discharge to waste piping for use during well testing and start up.

The water produced from the proposed well will be disinfected using sodium hypochlorite (NaOCl) before it is discharged into the water distribution system. The disinfection equipment will be housed in a chemical facility building, separate from the well building. The City has standardized the utilization of On-Site Generation (OSG) at all of their well sites to produce a 0.8% solution of sodium hypochlorite for disinfection using salt, softened water and electricity. Additionally, the system components include a water softener, bulk storage tanks for salt and NaOCl solution, metering pumps, a brine saturator, an electrolytic cell, and an electric rectifier.

The proposed well building will have three separate rooms, housing the well head and piping, electrical cabinets and SCE switchgear. The onsite generation disinfection equipment will be housed in a chemical facility building that will separate salt and brine storage areas from the hypochlorite production and storage area.

Each building will have reinforced, solid-grouted concrete masonry walls, a shallow concrete foundation, a concrete floor slab-on-grade, and a gable roof structure. The masonry walls will provide a high level of security, sound attenuation, durability and strength. The exterior surface of the masonry walls will be colored, textured, scored, and/or fluted to create an appearance that will complement the surrounding structures.

The proposed Washington Well project also includes several additional items to benefit the surrounding community, including the following:



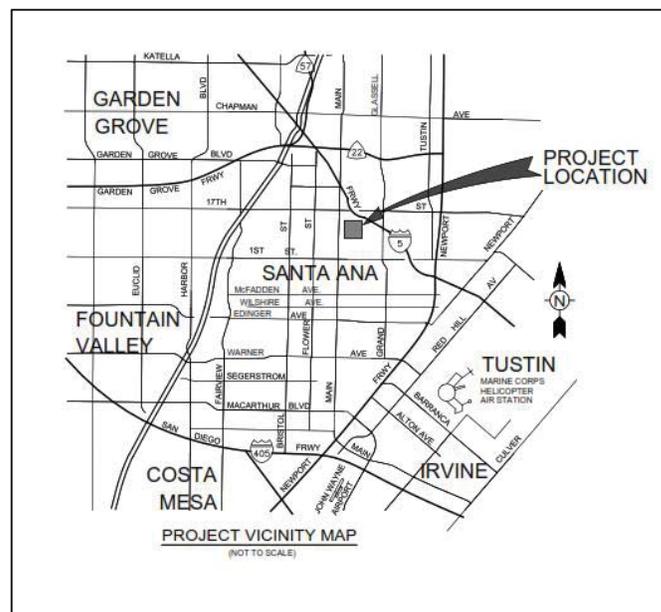
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- Perimeter wall will include facility identification, along with the placement of several plaques explaining the California Water Picture, the City's water system and how the Washington Well helps the City to be less dependent on imported water (public education).
- Landscaping the perimeter parkway with drought tolerant/California friendly landscaping. Plaques will explain the landscaping being utilized and how the drip-irrigation system works, and how it is a benefit to the community as a whole.
- Improving the perimeter walkway along Penn Way and at the intersection of E. Washington Avenue and Penn Way.
- Project will feature low impact design (LID) on-site improvements including bio-swales, bio-retention facilities, pervious pavement or pavers, etc. to minimize any off-site drainage.
- A Community Outreach Statement facility/structure emphasizing the neighborhood identity to encourage unity within the surrounding neighborhood.

Project Location:

Washington Well will be located on property owned by the City of Santa Ana at the northwest property at the intersection of East Washington Avenue and Penn Way. (latitude 33° 44' 44" N and 117° 52' 0" W longitude). A focused map of the well location is included in Appendix 6.

Figure 1: Project Location Map





D. Performance Measures

The proposed project offers significant specific performance measures that will quantify the benefits of the project once implemented. In doing so, the relative efficiency of the water management effort can be evaluated. These performance measures are as follows:

- 1. Pumping capacity.** Construction of the Washington Well is expected to increase the City's pumping capacity by approximately 2500 gpm. This equates to approximately 4000 Acre Feet (AFY) less import required on an annual basis.
- 2. Cost savings.** The expected cost savings of implementing Washington Well to service is two-fold. First, the expected added pumping capacity of 2500 gpm equates to approximately 4000 AF yearly that would not have to be imported. The difference in cost between pumped and import water is currently \$570 per AF. The cost savings for the proposed project is significant and easily quantifiable through this performance measure.
- 3. Pressure Augmentation/Stabilization:** SCADA equipment will monitor system pressure at various locations in the vicinity of the Washington Well. This data will be compared with historical system pressure data to determine the effectiveness of the Washington Well in improving the historic low system pressure in the vicinity.

E. Evaluation Criteria

E.1 Evaluation Criterion A — Project Benefits

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

Currently the City relies on approximately 70 percent of its supplies from MWD imported water connections that receive water from the Colorado River and the State Water Project from northern California, which are directly influenced by climate conditions in northern California and the Colorado River Basin, respectively. Both regions have been suffering from multi-year drought conditions which directly impact water supplies to southern California. The City's ability to pump from Washington Well will reduce the City's dependence on the drought-stricken states' limited water supplies, offering long-term drought resilience benefits (both quantifiable and qualitative) by providing an additional water supply, improving water management and indirectly benefitting fish, wildlife and the environment.

The proposed project is expected to increase the City's pumping capacity by approximately 2500 gpm, thus reducing the City's reliance on imported water by 4000 AF annually. The Washington Well improvement project is expected to provide benefits for about 50 years, following successful completion of the project.



Will the project make additional water supplies available? If so, what is the estimated quantity of additional supply the project will provide and how was this estimate calculated? What percentage of the total water supply does the additional water supply represent? How was this estimate calculated?

With a goal additional pumping capacity of 2500 gpm, the project proposes to add approximately 4000 AF of additional supply to the City on an annual basis. According to the City's most recent (2015) Urban Water Management Plan (UWMP), the City annually supplies 36,655 AFY to its residents. A simple mathematic calculation reveals that the proposed project will therefore increase the City's current supply by approximately 11 percent.

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

The ability to create any additional water supplies is extremely significant to the City and the state, as we continue to build long-term resilience to drought, by reducing our dependence on severely drought-stricken imported water supplies. The anticipated benefits associated with the additional water supply that will result from the construction of the Washington Well project include the following:

- Increasing the City's pumping capacity (2500 gpm) approximately 11 percent by providing an additional groundwater source;
- Providing a more drought resilient water supply alternative (4000 AFY)
- Providing a more economical water supply alternative
- Allowing the City to more efficiently distribute pumped groundwater throughout the municipal system to augment isolated low-pressure areas and improve/regulate overall system pressure
- Reducing wear and tear on other City wells (energy and capital cost savings)
- Reducing need for emergency response actions (demand for immediate alternate supply)

The great significance of these benefits is underscored with OCWD's execution of an Agreement with the City in 2016 to remove pumping limits and partially exempt the City from the Basin Equity Assessment (BEA) fees including for the proposed project. OCWD executed this Agreement with the City of Santa Ana in January 2016, recognizing the proposed project's potential to build long-term resilience to drought and reduce the need for emergency response actions. OCWD recognizes the importance of retail agencies such as the City of Santa Ana increasing the reliability of their water supplies and becoming more efficient with stressed water supplies, particularly as changes in climate continue to impact rainfall in the southern California region.

Will the project improve the management of water supplies? For example, will the project increase efficiency, increase operational flexibility, or facilitate water marketing (e.g., improve the ability to deliver water during drought or access other sources of supply)? If so, how will the project increase efficiency or operational flexibility?



The construction of the Washington Well will improve the management of water supplies on **both a local (City) and state-wide level**. Because it proposes to provide an alternative supply of **4000AF less imported water supplies annually**, it will improve the state's ability to better manage its imported water supplies, as well as allow the City to gain better control and **better manage** its local resources.

The proposed project will further improve the management of our local water supplies by **increasing efficiency and operational flexibility**. The 2017 Water Master Plan identified low-pressure deficiencies in the northeastern portion of the Low Zone on the south side of Interstate 5 between East 17th Street and East 1st Street. To resolve these low-pressure deficiencies, the Master Plan proposed a new well located in the vicinity of the Elevated Tank. Without the construction of the proposed Washington Well, the water pressure in this area may continue to drop and could reach an unacceptable level of service that is not adequate in comparison to the rest of the City's water system. The proposed project improves the management of water supplies by using Washington Well to augment the pressure in the local area to maintain acceptable levels of service.

The proposed project moves toward achieving the City's conservation goals, maintains an acceptable pressure in the City's existing piping network, adds an additional 2500 gpm of pumping capacity, and minimizes the negative impact to the community at large.

What is the estimated quantity of water that will be better managed because of this project? How was this estimate calculated?

According to a [September 9, 2019 Technical Memorandum, prepared by Tetra Tech, Inc.](#), the proposed project will add an additional pumping capacity of 2500 gpm to the system. The conversion factor from gpm to Acre Feet Yearly (AFY) is 1.613. (i.e. 1 gpm = 1.61301 AFY.) A simple calculation reveals that a pumping capacity of 2500 gpm calculates to 4000 AFY that will be better managed because of this project.

What percentage of the total water supply does the water better managed represent? How was this estimate calculated?

As calculated above, the quantity of water that will be better managed because of this project is more than 4000 AF annually. According to the City's most recent (2015) Urban Water Management Plan (UWMP), the City annually supplies 36,655 AFY to its residents. A simple mathematic calculation reveals that the proposed project anticipates that in excess 11 percent of the City's total water supply will be better managed, as a result.



Provide a brief qualitative description of the degree/significance of anticipated water management benefits.

The proposed project offers the following anticipated water management benefits, which collectively offer benefits of great significance:

- Provides 2500 gpm additional pumping capacity of to the City, allowing less reliance on imported water, thereby reducing negative impacts to the environment and the community at large
- Provides enhanced flexibility in the distribution system by using Washington Well to augment and regulate the pressure in the local distribution system
- Provides educational opportunities to the general public, encouraging their personal water management efforts

Will the project make new information available to water managers? If so, what is that information and how will it improve water management?

Water quality samples at the well discharges are typically collected by the City's water quality inspectors and contract testing laboratories, as well as by OCWD. The proposed project will provide this data for improved groundwater monitoring for both the City and OCWD. In addition, other necessary data such as total water use, change in groundwater storage, and elevation data can be obtained. This data will be made available to local (City) and regional (OCWD and their member agencies) users. **It is the intent of this project to improve water management through the examination of the water quality data that it will provide.**

Will the project have benefits to fish, wildlife, or the environment? If so, please describe those benefits.

By providing an alternate source of water, thus making the City less reliant on State Water Project (surface) water; fish, wildlife, and the environment will benefit from the protection of that water supply.

If the proposed project includes any of the following components, please provide the applicable additional information: Wells. What is the estimated capacity of the new well(s), and how was the estimate calculated? How much water do you plan to extract through the well(s)? Will the well be used as a primary supply or supplemental supply when there is a lack of surface supplies? Please provide information documenting that proposed well(s) will not adversely impact the aquifer it/they are pumping from (overdraft or land subsidence). At a minimum, this should include aquifer description, information on existing or planned aquifer recharge facilities, a map of the well location and other nearby surface water supplies, and



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physical descriptions of the proposed well(s) (depth, diameter, casing description, etc.). If available, information should be provided on nearby wells (sizes, capacities, yields, etc.), aquifer test results, and if the area is currently experiencing aquifer overdraft or land subsidence. Please describe the groundwater monitoring plan that will be undertaken and the associated monitoring triggers for mitigation actions. Describe how the mitigation actions will respond to or help avoid any significant adverse impacts to third parties that occur due to groundwater pumping.

According to the Sept 9, 2019 Technical Memorandum prepared by Tetra Tech, Inc. for the City of Santa Ana, the estimated additional pumping capacity of the Washington Well Rehabilitation project is 2500 gpm. The City expects to extract 4000 AFY from the Washington Well, which will be used as a primary supply. The ability to create any additional water supplies is extremely significant to the City and the state and is reflected in OCWD's execution of an Agreement with the City in 2016 to remove pumping limits and partially exempt the City from the Basin Equity Assessment (BEA) fees including for the proposed project.

The Washington Well will be installed with minimum of an 18-inch diameter casing. The design capacity of the well will be about 2,500 to 3,000 gpm well pump flow range; design head of about 400 to 450 feet; and the well pump will be driven by a 350 to 400 HP electric motor. Refer to Figure 1 for the location of the Washington Well and Figure 2 in Appendix 6 for other nearby City water supply wells.

The proposed project includes drilling the Washington Well to a depth of about 1,300 feet below ground surface (bgs). This depth is consistent with other wells in the city, so its expected impact on the aquifer is not significant. Additional information concerning the aquifer and basin management can be found in [OCWD's Annual Engineering Report](#), which includes aquifer description, information concerning aquifer recharge and test results, and information regarding nearby wells. The Washington Well design is directly parallel to these reports. OCWD's agreement with City of Santa Ana for lifting pumping limits and partially exempt the City from the Basin Equity Assessment (BEA) fees including for the proposed project is indicative of the aquifer's condition and management support.

Additionally, in September 2014; consulting groundwater geologists Richard C. Slade & Associates, LLC (RCS) submitted a technical report for Tetra Tech, Inc and the City of Santa Ana Water Engineering Division, entitled, "[Water Well Feasibility and Preliminary Design Report Proposed Well Nos. 42 and 43 City of Santa Ana](#)" (RCS Report). The purpose of this Preliminary Design Report (PDR) was to "evaluate hydrogeological conditions in the vicinity of the well site, identify logistical issues associated with the drilling and construction of the proposed wells; and provide preliminary well designs." Although this report did not specifically study the Washington Well site; because it is in very near proximity to the location of the two proposed



wells (42 and 43) that were the focus of the very detailed study, (within 2700 ft., the hydrogeologic conditions for the Washington Well site would be very similar, if not identical for those studied in the RCS Report. Therefore, with respect to hydrogeologic conditions, the conclusions of the RCS Report are understood to also be applicable for the Washington Well site.

The RCS Report provides an in-depth study of the regional and local hydrogeologic conditions. This report includes the figure entitled, “Generalized Stratigraphic Column for the Orange County Groundwater Basin,” (See Figure 3 in Appendix 6) which shows the various aquifer systems and the underlying rock units that have been characterized for the OCGWB by the California Dept. of Water Resources. DWR).

RCS performed a correlation of subsurface geologic units using downhole geophysical survey logs (E-logs) that were available for several City wells and other wildcat oil wells in the vicinity. This data is provided in Table 2 in Appendix 6.

Together the RCS Report and the OCWD Annual Engineering Report provide detailed and quantifiable information concerning the aquifer. Additionally, RCS evaluated available historic static water level (SWL) data provided by OCWD. Based upon their review of and interpretation of all of this available data, RCS concluded that it appears to be hydrogeologically feasible for the City to drill and construct (two) new municipal support water wells in this vicinity. Groundwater monitoring and mitigation will follow all OCWD requirements.

E.1.2. Evaluation Criterion B — Drought Planning and Preparedness

The City of Santa Ana’s DROUGHT ACTION PLAN is included in Appendix 4 of this report.

B. Explain how the Drought Action Plan addresses drought. Explain whether the drought plan was developed with input from multiple stakeholders. Was the drought plan developed through a collaborative process? Does the drought plan include consideration of climate change impacts to water resources or drought?

The City of Santa Ana hired a consultant to develop the Drought Action Plan with input from multiple stakeholders including the Planning, Parks, and Finance Departments. The Drought Action Plan addresses drought by implementing citywide conservation. The proposed project will reduce the city’s dependence on imported water and allow the city to utilize a resource already available within the city. The City of Santa Ana has a long history of collaborating with stakeholders on water conservation, including the Orange County Water District, Municipal Water District of Orange County and Metropolitan Water District of Southern California. The goal of each is to reduce demand on drought-stricken import supplies, through conservation and the implementation of alternate local sources. This is consistent with City’s Climate Action



Plan that includes reducing greenhouse gas emissions from City operations and the community through energy and water more efficiency as one of its strategies.

C. Describe how your proposed drought resiliency project is supported by an existing drought plan. Does the plan identify the proposed project as a potential mitigation or response action? Does the proposed project implement a goal or need identified in the drought plan? Describe how the proposed project is prioritized in the referenced drought plan?

The Washington Well project does not only comply with the City’s Drought Action Plan but it is fully supported by the regional supplier’s drought management plan (MWD). The proposed project will provide an additional 2500 gpm (4000 AFY) to the City's groundwater supplies, resulting in the City’s equivalent reduction in demand for imported water and allowing the city to utilize a resource already available within the city, which is consistent with the City’s Drought Action Plan. In August 1999; MWD adopted a “Water Surplus and Drought Management Plan”, and in 1996 adopted an evolving long-term water strategy known as the Integrated Water Resources Plan, or IRP. The IRP was updated in 2004, 2010, and 2015. Like the 2010 IRP Update, the 2015 IRP Update “looks to local solutions to close any potential gap between supply and demand,” representing a refinement — not an overhaul — of Southern California's water management strategy. The 2015 IRP Update projects a need for more than 723,000 AF of growth in imported and local supplies and reduced water demands from conservation within the 25-year horizon of the plan and is expected to frame future Implementation Policy discussions with MWD and its member agencies. **The proposed Washington Well project offers a local supply to help to close the projected gap between future demand and available supply, consistent with both City of Santa Ana and MWD drought management policies.**

E.1.3. Evaluation Criterion C — Severity of Actual or Potential Drought Impacts Addressed by the Project

Describe the severity of the impacts that will be addressed by the project. What are the ongoing or potential drought impacts to specific sectors in the project area if no action is taken (e.g., impacts to agriculture, environment, hydropower, recreation and tourism, forestry), and how severe are those impacts? Impacts should be quantified and documented to the extent possible.

The recent severe drought in California has put tremendous pressure on the state’s water allocation systems and shown that they are simply not capable of adapting to a sustained drought cycle. According to the University of Nebraska–Lincoln Drought Monitor, Orange County was declared a D5 “Exceptional Drought Area”, widespread water shortages or restrictions; widespread crop and pasture losses; shortages of water supply in reservoirs, streams and wells creating water emergencies. State-wide droughts have severely impacted both local waters supplies as well as imported supplies from the Colorado River and northern



California, from which the City of Santa Ana currently relies on for approximately 30 percent of its water supply.

The California drought has had a devastating impact on all aspects of the state. The **economic impact** of the drought to **agriculture** in California was an estimated \$2.7 billion and 21,000 total **job losses**, in 2015, alone. The **loss of hydropower** between October 2011 and October 2014 cost Californians approximately \$1.4 billion, as hydropower in the state was roughly cut in half. This lost hydropower was made up with the purchase and combustion of additional natural gas. The electricity ratepayers spent an additional \$1.7 billion to purchase natural gas over the drought period, which resulted in an additional 13 million tons of CO₂ emitted into the air—about a 10 percent increase in total annual CO₂ emissions from California power plants, thus having a detrimental impact on the state’s **air quality**.

In an L.A. Times editorial published in March 2017, Jay Famiglietti, Senior Water Scientist at the NASA Jet Propulsion Laboratory and a professor of Earth System Science at University of California, Irvine, stated that California has only one year of water stored in its reservoirs. The severe drought has depleted snowpack, lakes and rivers — affecting our water supply and the **recreational** opportunities and related **tourism** sectors (lodging, food, retail) that these resources provide.

A recent study from The Ecological Society of America (December 2016) states that declining streamflow and the accompanying rising stream temperatures have immediately threatened the provision of drinking water, hydropower generation and threatened the **health of ecosystems** that rely on water. Governor Jerry Brown declared an end to California’s historic five-year drought in April 2017, and the record rainfall in that year brought some relief to most of California. However, as recent of January 2018 the United States Drought Monitor noted that the City of Santa Ana and Orange County remain in “D1 Moderate Drought Status” for the foreseeable future. Additionally, there are long term impacts from the drought that will require more than one wet season to resolve.

The California drought **severely affected forestry** and the **wildlife** that inhabits that **environment**. Of the 85 million acres in California classified as wildlands, nearly 17 million are commercial forest land, approximately half of which are owned by the government. New research using high-tech tools to measure the moisture in trees found that 120 million trees across nearly every part of California are at risk of dying. The California Department of Forestry and Fire Protection (CAL FIRE), reported 29 million confirmed dead trees. Governor Jerry Brown has issued a state of emergency in California because trees are dying, creating more fuel for wildfires. A census by the U.S. Forest Service found 22 million trees are dead because of the drought, greatly **increasing the risk of wildfire**. CAL FIRE has determined that trees and vegetation play an important role in the vitality of California urban communities, affecting **property values, energy consumption, air quality, noise pollution, and wildlife**.



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There is no question that drought has severely impacted the City of Santa Ana's imported water supplies from the Colorado River and northern California. Drought resiliency for the City can best be provided by becoming less reliant upon imported water. By increasing its groundwater pumping capacity, the proposed Washington Well project will accomplish exactly that: allow the City of Santa Ana to be less reliant on import water. **Without the Washington Well project, the City of Santa Ana will continue to contribute to the demands on the limited and crucial supply of imported water that has already been severely compromised by drought in California, from which the City and much of the region has not yet fully recovered.**

Are there public health concerns or social concerns associated with current or potential drought conditions (e. g., water quality concerns including past or potential violations of drinking water standards?)

According to the Centers for Disease Control and Prevention (CDC), severe drought conditions can negatively affect **air quality**. During drought, there is an increased risk for wildfires and dust storms. Particulate matter suspended in the air from these events can irritate the bronchial passages and lungs. This can make chronic **respiratory illnesses** worse and increase the risk for respiratory infections like bronchitis and pneumonia. Some drought-related health effects are experienced in the short-term and can be directly observed and measured. However, the slow rise or chronic nature of drought can result in longer term, indirect health implications that are not always easy to anticipate or monitor.

The **public health and social concerns associated with drought conditions** may include the following:

- compromised quantity and quality of drinking water;
- increased recreational risks;
- effects on air quality;
- diminished living conditions related to energy, air quality, and sanitation and hygiene;
- compromised food and nutrition; and
- increased incidence of illness and disease.

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

The City of Santa Ana has only two sources of water: groundwater and imported water. There are no other sources, should the water service be interrupted. The proposed Washington Well project is intended specifically to provide an enhanced alternate water source to relieve some of the demand for imported water, so that the City becomes more drought resilient.

According to the January 12, 2018 report from the California Department of Water Resources, the current statewide storage supply is at 109 percent of average due to the 2017 rainy season, however water storage is still only at 63 percent of capacity. While state-wide projects like the California WaterFix are critical to the long-term reliability and stability of our imported supply,



upon which we will likely always be partially reliant, it is the City's goal to have local, reliable and drought-proof water projects be our primary supply.

Are there ongoing or potential environmental impacts (e.g., impacts to endangered, threatened or candidate species or habitat)?

There has been a tremendous environmental impact from the recent drought conditions. According to the Pacific Institute, many of the state's environmental flows went unmet during the drought period, **affecting aquatic ecosystems** and decreased protections for endangered species. The **increased salinity levels in the Bay Delta** (caused by less rainwater diluting the salinity of the water) have affected waterfowl, wildlife refuge and fisheries habitat. The recent drought has caused losses or destruction of fish and wildlife habitat, loss of wetlands, more wildfires and lower water levels in reservoirs, lakes, and ponds. Dry creeks and rivers led **18 fish species to diminish to near extinction**. According to The Public Policy Institute of California, a priority of the Proposition 1 water bond are California's ecosystems, which have been hit hard by the drought; 45 projects address water supply and habitat to support native species around the state. Wildlife that have thrived in urban habitats have also struggled to adapt as state and local conservation regulations force California homeowners to let their lawns and gardens dry and die.

Are there ongoing, past or potential, local, or economic losses associated with current drought conditions (e.g., business, agriculture, reduced real estate values)?

In 2015, the drought in California cost the state's economy \$2.7 billion and nearly 21,000 jobs according to a study from the University of California-Davis. In 2014, California voters passed Proposition 1, which is a \$7.5 billion water bond intended to provide significant investments in the state's drought-challenged water systems.

During the recent drought, the state issued mandatory water restrictions. The water rationing measures imposed by the state ironically made the per-unit cost of water higher since the "fixed costs" of the pipes and pumps did not change, but the amount of water sold went down. In order for water districts to recover their costs, they needed to charge the ratepayers more per unit for water.

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

Water is a precious commodity in naturally semi-arid southern California. Over the past 100 years, the "Lower Basin" states of the Colorado River Compact (which include Nevada, Arizona, and California) have long battled over water rights to the Colorado River. A prime example of these tensions were the conflicts between the city of Los Angeles and the farmers and ranchers in the Owens Valley of Eastern California. Since 1913, the Owens River had been diverted to Los Angeles, causing a severe decline in the valley's economy. So much water was being diverted



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from the Owens Valley that the farmers tried to destroy the aqueduct in 1924. Tensions continued, and as late as 1979, they sued the Los Angeles Department of Water and Power (LADWP) over its excessive water diversion from Mono Lake. As water becomes more scarce tensions such as these are expected to escalate. The proposed project will alleviate such issues among local water agencies.

Describe existing or potential drought conditions in the project area.

The years 2012 to 2015 marked the driest four-year period in 120 years of historical records, along with historic high temperatures (California Department of Water Resources, 2015). Additionally, between 1976 and 2016, California's population has almost doubled, from 22 million to 40 million; increasing pressure and demand on limited existing resources.

Although there has very recently been a certain degree of drought relief in Southern California, as recently as January 2018, a NOAA report showed that the “drought persists” in Southern California, and “drought development” is “expected to expand” to the north in the immediate future. For the Southern California region, the October 2019 NOAA report states that “long term dryness is still evident”.

Is the project in an area that is currently suffering from drought or which has recently suffered from drought? Please describe existing or recent drought conditions, including when and the period that the area has experienced drought conditions (please provide supporting documentation, [e.g., Drought Monitor, droughtmonitor.unl.edu]).

According to [University of Nebraska–Lincoln Drought Monitor](#), the City of Santa Ana had been in a continuous drought status, ranging from a D1 (Moderate Drought) area to D5 (Exceptional Drought) from February 2012 well into 2018. The October 3, 2019 report states that although there has been some recent relief, long term dryness is still evident.

On April 1, 2015, Governor Jerry Brown issued an executive order to cities across California to cut water use by 25 percent as part of a sweeping set of mandatory drought restrictions, the first in state history. On April 14, 2015, the governing board of the Metropolitan Water District (MWD) acted to reduce water deliveries to its member agencies, including the City of Santa Ana. Beginning July 1, 2015, the City’s water deliveries were reduced by 15 percent.

Describe any projected increases to the severity or duration of drought in the project area resulting from climate change. Provide support for your response (e.g., reference a recent climate change analysis, if available)

According to the Intergovernmental Panel on Climate Change (IPCC), the warming of the climate system is unequivocal. The period from 1983 to 2012 was likely the warmest 30-year period of the last 1400 years in the Northern Hemisphere (IPCC, 2014). California’s temperature record reflects global temperature trends.



The NOAA Climate Divisional Dataset is a long-term dataset used to generate historical (1895-2016) climate analyses for the contiguous United States. In the most recent report covering California, within Climate Division 2 (Sacramento Drainage), the long-term record depicts a dramatic shift in annual average temperature. The data points from the 21st century indicate an overall shift in climate compared to the historical record. Data from NOAA Climate Divisional Dataset, Division 6 (South Coast Drainage, including the City of Santa Ana) depicts even more annual precipitation variation from 5 to 40 inches per calendar year. The past 15 years since the turn of the century are also extremely warm and dry, indicating a change in climate. The three years (2014-2017) are depicted as being some of the warmest and driest years on record, with the warmest on record occurring in 2015, and the second warmest in 2016. ([Hydroclimate Report Water Year 2016](#))

E.1.4. Evaluation Criterion D — Project Implementation

Describe the implementation plan of the proposed project. Include an estimated project schedule that shows the duration of the proposed work, major tasks, milestones, and dates.

The **Estimated Project Schedule** below summarizes the stages and duration of the proposed work, including major tasks, milestones, and estimated dates. City of Santa Ana has completed all the preliminary studies and the well design will be completed in Spring of 2020. City has also consulted with the other city departments and has approval on the location of the well site and its development.

Table 2: Estimated Project Schedule

ESTIMATED PROJECT SCHEDULE			
No.	Task / Milestone	Start Date	Completion Date
1	Preliminary Design		complete
2	Environmental Review	Jan 2020	Nov 2020
3	MND Approval	Sep 2020	Nov 2020
4	RFP for Design	-	Nov 2019
5	Design Period - Part 1 (Drill and Test Well)	Jan 2020	Apr 2020
	a 60% Design Submittal	Jan 2020	Feb 2020
	b 90% Design Submittal	Feb 2020	Feb 2020
	c Outside Agency Review	Feb 2020	Mar 2020
	d 100 % PS&E Submittal	Mar 2020	Apr 2020
6	Public Bid Process - Part 1	Apr 2020	Apr 2020
7	Award Constr. Contract - Part 1	Apr 2020	Apr 2020
8	Construction - Part 1 (Drill and Test-Pump Well)	May 2020	Nov 2020
9	Design Period - Part 2 (Well facility and site)	Dec 2020	Mar 2021
	a 30% Design Submittal	Dec 2020	Jan 2021
	b 60% Design Submittal	Jan 2021	Feb 2020
	c 90% Design Submittal	Feb 2021	Feb 2021
	d Outside Agency Review	Feb 2021	Mar 2021
	e 100% PS&E Submittal	Mar 2021	Mar 2021
10	PS&E Approval	Apr 2021	May 2021
11	Part 2: Public Bid Process	June 2021	June 2021
12	Part 2: Award Constr. Contract	July 2021	July 2021
13	Part 2: Construction Period	Aug 2021	Dec 2021
14	Project Complete	Dec 2021	Dec 2021



Describe any permits that will be required, along with the process for obtaining such permits.

Table 3: Anticipated Permits and Processes for Approval

Anticipated Permit	Process for Approval or Issuance
Public Works approval of plans and specifications	Plans and Specifications to be reviewed by City engineering staff and approved by the Water Resources Manager
City of Santa Ana Building Department to issue appropriate building permits	Plans and Specifications to be reviewed and approved by City Building Department staff and issue appropriate building permits
Well drilling permits	Well driller to apply for and receive approval from the Orange County Health Care Agency prior to commencement of any drilling operations
National Pollutant Discharge Elimination System (NPDES) permit	City to apply for and receive NPDES permit (or amend existing permit) to dispose of test water prior to commencement of any drilling operations
City’s public bid process for lowest responsible bidder	Compliance with State of California Public Contracts Code
State of California Department of Public Health approvals for acceptable drinking water standards	City to submit Water Quality reports for approval
Southern California Edison (SCE) permit for electrical service	Coordination for issuance by SCE
State Water Resources Control Board approval for storm water and test pumping discharge	City to apply for issuance by SWRCB
Orange County Flood Control District permit for discharge to County facility during test pumping operation	City/contractor to apply for issuance by Orange County Flood Control District

Anticipated permits (and the process for their approval/issuance) is expected to include the following:

Identify and describe any engineering or design work performed specifically in support of the proposed project.

In September 2014; consulting groundwater geologists Richard C. Slade & Associates, LLC (RCS) submitted a technical report for Tetra Tech, Inc and the City of Santa Ana Water Engineering Division, entitled, “[Water Well Feasibility and Preliminary Design Report Proposed Well Nos. 42 and 43 City of Santa Ana](#)”. The purpose of this Preliminary Design Report (PDR) was to “evaluate hydrogeological conditions in the vicinity of the well site, identify logistical issues associated with the drilling and construction of the proposed wells; and provide preliminary well designs. Although this report did not specifically study the Washington Well site, it is in very near proximity (within 2700 ft) to the location of the other two proposed wells (42 and 43) that were the focus of the study. The hydrogeologic conditions for the Washington Well site would be very similar, if not identical for those studies in this report. . Therefore, the conclusions of this study are understood to be applicable for the Washington Well as well.



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On September 9, 2019, Tetra Tech, Inc., submitted a Technical Memorandum to the City of Santa Ana, providing an Executive Summary of their evaluation of the Washington Well project. The summary addressed the following: project need, project description, well hydraulics, well construction, well design parameters, onsite generations, (e.g. disinfection), buildings and benefits to the community. The preliminary design is now complete, and comments have been received from all City departments. The RFP for final engineering design is ready and will be released in November 2019 and is expected to be completed in April 2020.

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

There are currently no new policies required to implement the project; the following administrative actions required:

1. Public Works approval of *plans and specifications*
2. *Public Bid process to determine the lowest responsible bidder*
3. *Santa Ana City Council to award construction contract (to the lowest responsible bidder) and approve project funding.*
4. *City of Santa Ana Building Dept. to issue appropriate building permits.*
5. City of Santa Ana Public Works Dept. to issue Public Encroachment Permit(s)
6. Southern California Edison (SCE) to issue permit for electrical service.
7. Orange County Health Care Agency to issue well drilling permit.
8. City to apply for and receive NPDES permit (or amend existing) to dispose of test water.
9. State Water Resources Control Board to issue permit for storm water and test pumping discharge.
10. Orange County Flood Control District to issue permit for work in County right-of way and approval for test pumping discharge.
11. City to submit water quality reports to the State of California Department of Public Health for approval and compliance with acceptable drinking water standards.
12. Construction Management will be provided by a 3rd party consultant (8% construction costs anticipated).
13. Grant Compliance: The City of Santa Ana has professional grant consultants on contract that will utilize to assure all the Bureau of Reclamation requirements are met in a timely manner.

Describe how the environmental compliance estimate was developed. Has the compliance costs been discussed with the local Reclamation office?

The task for preparation of the environmental and regulatory compliance will be included in the RFP as part of the scope of work for the selected design team and the cost will be included as part of that award. The estimated compliance costs have been considered in the overall project budget; however, costs have not been discussed with the local Reclamation office.



E.1.5. Evaluation Criterion E — Nexus to Reclamation

How is the proposed project connected to a Reclamation project or activity?

As noted earlier, the City of Santa Ana receives approximately 70 percent of its water from the Metropolitan Water District of Southern California, which is the designated contractor for the Colorado River Project and the Cal Fed Bay Delta Project (State Water Project). This project proposes to reduce the City's use of imported water and establish a sustainable local water source.



SECTION 2: PROJECT BUDGET

Standard Form 424 Budget Information A or C

This document is included in the separate submission with all of the City of Santa Ana’s completed Standard Form 424 copies.

A. Funding Plan and Letters of Commitment

The City of Santa Ana does not have any third-party funding sources or expected Federal funding sources outside of this application for assistance. Currently, the City does not have any pending funding requests for this project outside of this application and will provide the funding from the Water Utility Capital Project Funds that will be allocated as part of the Capital Improvement Program for the proposed project.

No Letters of Commitment are included as there are no third-party funders for this project.

B. Budget Proposal

Washington Well is located in northeast Santa Ana at the northwest corner of Washington Avenue and Penn Way. The property is a City asset purchased in January 2018 for \$1,083,750. The City has completed the preliminary design and is pursuing this grant opportunity to assist with the final engineering design and construction cost.

Table 4: Total Project Costs by Source

SOURCE	AMOUNT	Percentage
Costs to be reimbursed with the requested Federal funding	\$750,000	11.4
Costs to be paid by the applicant	\$5,840,117	88.6
Value of third party contributions	\$0	0
Total Project Cost- Phases I & II	\$6,590,117	



Table 5: Funding Sources

Funding Sources	Amount
City of Santa Ana - Cash Contributions	\$5,786,800
City of Santa Ana value of in-house resources	\$53,317
Subtotal: Non-Federal Funding	\$5,840,117
Bureau of Reclamation Grant for this proposal	\$750,000
Other Funding	\$0
Subtotal: Federal Funding	\$750,000
Total:	\$6,590,117

Table 6: Budget Proposal Funding

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	TOTAL COST
	\$/Unit	Quantity		
Salaries and Wages				\$35,793
Water Resources Director	\$84.09/Hour	156	Hour	\$13,118
Project Manager	\$69.47/Hour	312	Hour	\$21,675
Fringe Benefits				\$17,524
Water Resources Director	\$48.55 /Hour	156	Hour	\$7,574
Project Manager: Senior Civil Engineer	\$31.89/Hour	312	Hour	\$9,950
Equipment				
Supplies and Materials				
Not Applicable				
Contractual/Construction				\$5,460,000
Construction including contingency	2 contacts			\$5,460,000
Third-Party Contributions				
None				\$0
Other				\$1,066,800
Design Engineering including environmental process and support during construction				\$630,000
Construction Management Consultant				\$436,800
Total Direct Costs				\$6,580,117
Indirect Costs				\$10,000
BOR Environmental Review				\$10,000
Total Estimated Project Costs				\$6,590,117



C. Budget Narrative

Washington Well is located in northeast Santa Ana at the northwest corner of Washington Avenue and Penn Way. The property is a City asset currently valued at \$1,083,750. The project elements for the Washington Well Project will cost over \$6.5 million. The City has completed the preliminary design and is pursuing this grant opportunity to assist with the final engineering design and construction cost. As noted above, in-house project management during design and construction have not been included as part of the matching fund.

Salaries and Wages & Fringe Benefits

The Program Manager for this project will be Nabil Saba, PE and the direct City Project Manager will be Rudy Rosas, PE, throughout design and construction. They will be assisted with support from construction management team including supervisor, inspector, and clerical staff.

The salary rates for all positions is available below:

http://www.ci.santa-ana.ca.us/personnel/documents/salary_schedule.pdf

Travel

There will not be any travel expenses incurred as part of this project

Equipment

The cost of all equipment needed is included in the construction cost. The equipment needed will be identified once the design has been completed.

Materials and Supplies

The cost of all equipment needed is included in the construction cost. The equipment needed will be identified once the design has been completed.

Contractual

The RFP for engineering design is completed and is scheduled for release in November 2019.

Two construction contracts will be awarded pursuant final completion of engineering design and advertising for bids following the public contract code requirements once the construction documents have been completed. One contract will be for the drilling and test pumping of the well, and the other will be for the equipping of the well, construction of the well buildings and site improvements.

Construction management of the project (estimated at industry standard 8 percent) will be provided by a third-party consultant. The design support will be provided by the engineering design consult.



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Environmental and Regulatory Compliance Costs

Costs to cover environmental compliance are included in the project budget. The task for preparation of the environmental and regulatory compliance will be included as part of the scope of work for the selected design team.

Other Expenses

All costs are reflected in the Budget Proposal Table.

Indirect Costs

These costs are included in the item above. The City of Santa Ana has not received federal negotiated indirect cost rate.

Total Costs

The proposed project's total cost is \$6,590,117, including the Federal Assistance Grant requested in this document.



SECTION 3: ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

Included below is the list of questions that all applicants must respond to, with the answers below each question.

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

Other than typical dust and noise generated from construction activity, the project is not expected to have any impact on the surrounding environment. Dust control will be mitigated through compliance with local Air Quality Management District (AQMD) requirements. Construction noise is not expected to exceed that allowed by local code. It is anticipated that the project will be a Mitigated Negative Declaration for CEQA.

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

There are no known species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitat in the project area.

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

There are no known wetlands or other surface waters inside the project boundaries.

When was the water delivery system constructed?

The majority of the City's water delivery system was constructed in the mid 1900's.

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

No; the proposed project will not result in any modification of or effects to, individual features of an irrigation system (e.g., head gates, canals, or flumes).



Are any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places? A cultural resources specialist at your local Reclamation office or the State Historic Preservation Office can assist in answering this question.

No; there are no buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places within the proposed project area.

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

No; there are no known archeological sites in the proposed project area.

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

No; the proposed project will NOT have a disproportionately high and adverse effect on low income or minority populations. In fact, the proposed project will have a **POSITIVE** effect on the local (and statewide) population, including low income and minority populations, of which Santa Ana has historically had one of the lowest per capita incomes in all of Orange County. The local population (of which more than 78 percent was of Hispanic or Latino race in 2010) will benefit from high quality, cost effective drinking water and the drought stricken state-wide population will benefit from the increased availability of imported water.

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

No; the proposed project will NOT limit access to and ceremonial use of Indian sacred sites or result in other impacts on tribal lands.

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

No; the proposed project will NOT contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area.



SECTION 4: REQUIRED PERMITS OR APPROVALS

All proposed work shall comply with all local, state, and federal requirements. Other than environmental process, the anticipated permits and approvals include the following:

Anticipated Permit	Process for Approval or Issuance
Public Works approval of plans and specifications	Plans and Specifications to be reviewed by City engineering staff and approved by the Director of Public Works/City Engineer
City of Santa Ana Building Department to issue appropriate building permits	Plans and Specifications to be reviewed and approved by City Building Department staff and issue appropriate building permits
Well drilling permits	Well driller to apply for and receive approval from the Orange County Health Care Agency prior to commencement of any drilling operations
National Pollutant Discharge Elimination System (NPDES) permit	City to apply for and receive NPDES permit (or amend existing permit) to dispose of test water prior to commencement of any drilling operations
City’s public bid process for lowest responsible bidder	Compliance with State of California Public Contracts Code
State of California Department of Public Health approvals for acceptable drinking water standards	City to submit Water Quality reports for approval
Southern California Edison (SCE) permit for electrical service	City to apply for issuance by SCE
State Water Resources Control Board approval for storm water and test pumping discharge	City to apply for issuance by SWRCB
Orange County Flood Control District permit for discharge to County facility during test pumping operation	City/contractor to apply for issuance by Orange County Flood Control District



SECTION 5: EXISTING DROUGHT CONTINGENCY PLAN

Article VI of the City of Santa Ana’s Code of Ordinances is considered to be the City’s “drought contingency plan.” As requested, it is attached to this report in Appendix 5.

SECTION 6: LETTERS OF SUPPORT

Per Reclamation’s application guidelines in Section D.2.2.9. Letters of Support, all statements of support from interested stakeholders are included in Appendix 2.

SECTION 7: OFFICIAL RESOLUTION

The City of Santa Ana Council approved a resolution to authorize grant applications for water recycling and WaterSMART Drought Response Programs on October 15, 2019, a copy of which is attached in Appendix 1.

SECTION 8: LIST OF SUPPORTING DOCUMENTS AND APPENDICES

Appendix	Supporting Document
Appendix 1	Draft Council Resolution
Appendix 2	Letters of Support
Appendix 3	Copy of SAM Proof of Enrollment
Appendix 4	Santa Ana Drought Action Plan
Appendix 5	Drought Contingency Plan
Appendix 6	Figures and Tables
Supporting Documents for Online Reference	
City of Santa Ana 2017 Water Master Plan https://www.santa-ana.org/sites/default/files/Documents/2017WaterMasterPlan.pdf	
City of Santa Ana climate Action Plan https://www.santa-ana.org/sites/default/files/Documents/climate_action_plan.pdf	
United States Drought Monitor University of Nebraska – Lincoln, USDA, NOAA http://droughtmonitor.unl.edu/Data/Timeseries.aspx	



Economic Analysis of the 2015 Drought for California Agriculture University of California - Davis https://watershed.ucdavis.edu/files/biblio/Economic_Analysis_2015_California_Drought_Main_Report.pdf
Impacts of California's Ongoing Drought: Hydroelectricity Generation Pacific Institute https://www.pacinst.org/wp-content/uploads/2015/03/California-Drought-and-Energy-Final1.pdf
California has about one year of water stored. Will you ration now? Los Angeles Times 03/12/15 http://www.latimes.com/nation/la-oe-famiglietti-drought-california-20150313-story.html
Climate change and water-related ecosystem services: impacts of drought in California, USA Ecological Society of America https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ehs2.1254
The California Drought's Alarming Toll on Forests HuffPost 02/19/2016 https://www.huffingtonpost.com/entry/california-drought-dying-trees_us_56c78f0fe4b0ec6725e2a1a0
Resource Management California Department of Forestry and Fire Protection https://www.fire.ca.gov/programs/resource-management/
<i>Drought and Your Health</i> Centers for Disease Control and Prevention https://www.cdc.gov/features/drought/index.html
California Data Exchange Center Department of Water Resources http://cdec.water.ca.gov/cgi-progs/reservoirs/STORAGEW
California Drought Impacts Full Report Pacific Institute https://pacinst.org/publication/drought-and-equity-in-california/
<i>How Is California Spending the Water Bond?</i> Public Policy Institute of California http://www.ppic.org/blog/how-is-california-spending-the-water-bond/
California drought cost is 2.7 billion in 2015 USA Today 08/19/15 https://www.usatoday.com/story/weather/2015/08/19/california-drought-cost-27-billion-2015/32007967/
<u>Understanding California's Groundwater</u> Water in the West / Stanford University http://waterinthewest.stanford.edu/groundwater/conflicts/index.html
Climate Change 2013 Intergovernmental Panel on Climate Change https://www.ipcc.ch/meeting-doc/ipcc-wgi-12-and-ipcc-36-stockholm-sweden-23-26-september-2013/
<i>Hydroclimate Report Water Year 2016</i> California Department of Water Resources www.water.ca.gov/climatechange/docs/2018/2016_HydroclimateReport.pdf