



**Long Beach Water**  
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## **Well Asset and Groundwater Management and Forecasting Tool**

**WaterSMART: Applied Science Grants for FY2022  
No. R22AS00165**

***Prepared For:***

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## **SECTION 1: REQUIRED FEDERAL FORMS**

**SF-424 Application for Federal Assistance – Separate Submission**

**SF-424A Budget Information – Separate Submission**

**SF-424B Assurances – Separate Submission**

**SF-LLL Disclosure of Lobbying Activities – Separate Submission**

**Project Abstract Summary – Separate Submission**

## SECTION 2: TECHNICAL PROPOSAL AND EVALUATION CRITERIA

### *Executive Summary*

**Applicant Name: Long Beach Water Department  
City of Long Beach, County of Los Angeles, CA**

**Date: April 14, 2022**

The Long Beach Water Department (LBWD) Well Asset and Groundwater Management and Forecasting Tool Project (“Project”) will develop the tools and procedures necessary to effectively monitor wellfield operations, assess critical factors affecting current and future groundwater production, and provide the foundations for proactive decision making regarding well operations, maintenance, and production. The Project’s main objective is to develop and utilize applied science and related tools and technology to maximize LBWD groundwater withdrawal in a sustainable and reliable manner. The Project will improve LBWD wellfield data and collection management; groundwater production planning and forecasting; asset maintenance scheduling and prioritization; and supply management. Funding will be used to:

- Improve access/use of water resources data to better inform water management decisions
- Develop a digital Water Management Tool (Tool) to help provide short and long-term estimates of groundwater pumping to improve modeling and forecasting capabilities
- Perform real time analytics and LBWD well performance audits, using the Tool to integrate real-time data to improve water supply reliability and increase flexibility in water operations
- Develop a Well Asset Management Plan to allow for and improve inter-agency coordination for regional monitoring and planning purposes
- Improve/ enhance LBWD management of water supplies and operations, helping LBWD to meet its water production goals by increasing and maintaining the current allowable pumping allocation (APA) of the Central Basin, and reliably forecast future aquifer pumping
- Provide short-term and long-term forecasting of groundwater production to assist Water Replenishment District of Southern California (WRD) and Metropolitan Water District of Southern California (MWD) with anticipating LBWD water supply needs.

In summary, the proposed Project will “**develop hydrologic information and water management tools and improve modeling and forecasting capabilities**”; this is literally the main goal stated on the first page of this Notice of Funding Opportunity. The Project is not located on a federal facility and is expected to be completed in April 2023.

### *Technical Project Description*

*The technical project description should describe the work, including specific activities that will be accomplished. As part of this discussion, please address the following:*

- **Detailed Project Description:** *Provide a more comprehensive description of the technical aspects of your project, and **Goals:** Discuss the preliminary goals and objectives of the Project.*

LBWD is a Category A applicant for the Project, which will develop the tools and procedures necessary to effectively monitor well field operations, assess critical factors affecting current

and future production, and provide the foundations for proactive decision making regarding well operations and maintenance. The Project will develop a well asset and groundwater management tool (“Tool”) to improve modeling and forecasting capabilities that will yield hydrologic information. This will allow LBWD to maximize its groundwater withdrawal in a sustainable and reliable manner, helping to meet its water production allowable pumping allocation (APA) goals and thereby thus optimizing usage of water supplies.

Currently, LBWD utilizes InfoWater for collection system water modeling and Microsoft Excel for recording and forecasting groundwater production. Forecasting is a multi-step manual process using hand calculations and generic assumptions that do not lend themselves to system wide analysis or reliable and accurate results. Furthermore, the current system does not have specific standard operating procedures or guidelines, often resulting in inconsistent data collection, which may be problematic for operations and planning needs.

This lack of accurate and reliable data can cause LBWD to make technical water production decisions in a reactionary manner rather than having the ability to implement pre-established measures to efficiently address operational issues as they arise. For example, LBWD currently addresses well maintenance needs once issues arise with well production and function. The Tool will allow LBWD to project and extend the useful life of its wells and have proactive well maintenance strategy as opposed to a reactive strategy. Furthermore, and perhaps even more critical, the lack of reliable information concerning the patterns and availability of groundwater hinders the long-term planning efforts needed to make the best water resources decisions. One specific example of a current operational issue resulting from this current process is that at any given time, one or more of LBWD’s groundwater production wells may be out of service due to mechanical and/or structural failure that could have been proactively identified and avoided, or the ability to have a data informed strategy for performing well and/or pump maintenance; as such, LBWD is not currently able to fully utilize local groundwater supplies.

In an effort to replace/improving upon the current system, LBWD recently awarded a contract to Stanley Consultants, Inc. to assist with the development of the Project, and implementation of the Tool that will effectively monitor well field operations, assess critical factors affecting current and future projection production, and provide the foundations for intelligent decision-making regarding operation and maintenance of each well. This will allow local groundwater resources to be utilized to the fullest extent possible.

The Tool will link to pertinent data from various other sources such as supervisory control and data acquisition (SCADA) historic data, maintenance management system data, laboratory data, spreadsheets, and other LBWD business systems and connect to other data sources that will provide interfaces for user inputs. Data includes water rights accounting, well construction information, monitoring feature details, static groundwater levels, pumping groundwater levels, instantaneous pumping rate, and entrained sand production volumes. The Tool will have the capability to be upgraded in the future to include advanced optimization and/or artificial intelligence (AI) to further improve the performance of wells and their pumps. It will have the

ability to forecast future groundwater production volumes aligned with the Project objectives. Decision tree criteria, or “trigger” mechanisms will be incorporated within the Tool, which will help indicate certain action(s) needed regarding well or pump repair and/or rehabilitation. Ultimately, the Tool will be managed by LBWD, and will assist in the development of future LBWD Audits and Plans such as a Well Performance Audit (“Audit”) and recommend a Well Maintenance Plan (“Plan”).

Project goals have been established to produce the following deliverables:

- A working Tool of the Long Beach groundwater supply system
- A Well Asset Management Plan, developed with the Tool, which will allow the LBWD to meet its improved water quantity goals and reliably forecast future aquifer pumping
- A report summarizing the development of the Tool (as well as a supplemental training manual, and staff training in the use and improvement of the Tool)
- Completion of the first annual Water Audit providing a comprehensive evaluation of the current condition of each well, with findings and recommendations for future pumping and well maintenance activities on a well-by-well basis.
- Presentation of an annual Water Audit, providing results and recommendations to regional and local stakeholders within an inclusive technical workshop setting.

The technical approach/methodology to achieve these goals/deliverables is described in the proposal by Stanley Consultants, Inc. (Appendix C) dated December 22, 2021, and is summarized below:

**1. Develop Preliminary Report.** This phase builds the foundation for the development of the Tool and capital improvement planning for the LBWD well system to meet production goals.

**2. Planning Criteria and Digital Water Management “Tool” Development.** Needs analysis will be used to determine the criteria related to reporting, production forecasting approach and methodology, and development of decision-making criteria that will help indicate certain actions needed regarding asset repair and/or rehabilitation. The Tool is the principal component of the Project, it is where data such as water rights accounting, well construction information, monitoring feature details, static groundwater levels, pumping groundwater levels, instantaneous pumping rate, and entrained sand production volumes will reside, and can integrate information such as engineering plans, equipment specs, well inspection videos and other relevant documentation. Once data has been integrated, a detailed decision tree will be developed that will form the foundation of the analytical methodologies to be utilized by the Tool, which will provide capabilities for groundwater production and forecasting using advanced analytics and algorithms.

**3. Refined Report and Tool Utilization.** This phase includes development and utilization of the Tool; reporting historical well production; pumping projections at 1, 5, and 10 years; water rights balance accounting projections; and identification/use of “triggers” or decision-making criteria regarding well maintenance planning. A Refined Report will be provided, shared electronically, and explained in detail during the training sessions and will include Digital Water

Model Historical Water Consumption Analysis, Well Water Pumping Projection Forecasting and Water Rights Balance Accounting Projections. The Tool will also incorporate an aggregated water balance calculator, allowing LBWD to calculate past and future water production costs by source and consolidated. The detailed study of historical data, trends, pumping curves and real-time information will provide the necessary inputs to integrate a set of rules-based decision trees that will trigger alerts if action is needed on any well.

**4. Final Report.** This phase will include the finalized technical memorandum discussing the Water Model Audit, the Well Performance Audit and workshop and the Well Maintenance Plan. The Well Asset Management Plan will be based on the results of the Audit with the assistance of the Tool and will help LBWD to meet its water quantity goals and reliably forecast future groundwater aquifer pumping. The Well Maintenance Plan will address actions needed to repair and/or rehabilitate assets for the following year, and present overall groundwater production projections.

### Project Location

The Project will benefit all served by the LBWD, which covers a water service area of approximately 50 square miles, including the City of Long Beach with a population of approximately 497,000. The Southern California Association of Governments (SCAG) projects the service area population to reach approximately 560,000 by 2050. Figure 1 shows a map of LBWD’s service area in relation to the local groundwater basins. LBWD supports many iconic sites as well as the Port of Long Beach which is the second busiest container port in the United States.

Figure 1. Project Location



### Data Management Practices

LBWD certifies that the spatial data developed within the project will be developed under industry standard formats that are compatible with Geographic Information Systems (GIS) platforms.

### Evaluation Criteria

#### Evaluation Criterion A - Benefits to Water Supply Reliability (40 points)

1. Describe in detail the water management issue(s) that are occurring within your project are that your project will address. Describe the severity of the water management issues to be addressed with supporting details.

Due to the inherent lack of efficiencies and accuracies of its current water management data collection and forecasting methods, LBWD been unable to take full advantage of its pumping rights. The proposed Project will develop a digital Tool to “improve modeling and forecasting capabilities” which will allow LBWD to better manage and **maximize its groundwater withdrawal in a sustainable and reliable manner by taking full advantage of its pumping**



**rights.** The Project’s proactive management of local water supplies will reduce LBWDs reliance on severely threatened imported supplies from the Colorado River and State Water Project (SWP), whose limited availability is becoming increasingly more vulnerable as a result of competing demands for water and the complications from drought that often result in conflicts. As previously discussed, currently LBWD manages its well assets and groundwater supplies in a somewhat fragmented and unsophisticated hodgepodge of manual data collection and operators’ visual field observations. **This lack of reliable data can often result in groundwater management and water production decisions being made in a reactionary manner**, rather than providing the ability to implement pre-established measures that will efficiently and proactively address operational issues as they arise. In addition, the **lack of reliable information with respect to the patterns and availability of groundwater can hinder the long-term planning efforts** needed to develop a comprehensive blueprint to enable LBWD to make the best water resources decisions and better manage to ensure a reliable and sustainable water supply. One specific example of a current operational issue resulting from current processes is that at any given time, one or more of LBWD’s groundwater production wells may be out of service due to mechanical and/or structural failure that could have been identified quickly enough to be proactively avoided; as such, LBWD is not currently able to maximize use of local groundwater supplies.

**The Project will replace the current manual processes to greatly improve management of well assets and groundwater supplies** through the development and implementation of a digital “Tool” that will effectively monitor well field operations, assess critical factors affecting current and future projection production, and provide the foundations for intelligent decision-making. The Tool will be developed in an industry standard format compatible with GIS platforms and will connect to other data sources that will provide interfaces for user inputs including water rights accounting, well construction information, monitoring feature details, static and pumping groundwater levels, instantaneous pumping rate, and entrained sand production volumes. **The Tool will also have the ability to forecast future groundwater production volumes aligned with the Project’s objectives.** Decision tree criteria mechanisms will be incorporated to help indicate certain action(s) needed regarding well or pump repair and/or rehabilitation. Ultimately, **the Tool will be managed by LBWD, and will assist in the development of future LBWD Audits and Plans for continuous improved well asset and groundwater management.** The **Project’s proactive approach will allow local groundwater resources to be utilized to the fullest extent** possible.

The **Project will address perhaps the most severe water management issues, including water supply shortfalls and uncertainties, need to meet competing demands for water and complications and conflicts arising from drought** and climate change. These issues are interrelated and are underlain by the impacts of drought. On October 19, 2021, California Governor Gavin Newsom declared a statewide State of Emergency due to drought, followed by the November 9, 2021, MWD Board of Directors declaration of a drought emergency. With



climate change resulting in hotter, drier summers and reduced precipitation, severe and prolonged droughts are predicted to be a normal part of California’s future.

Water management issues are becoming increasingly more critical. Water production, conveyance and treatment infrastructure is deteriorating at an accelerating rate, which is creating uncertainties and immense challenges as LBWD struggles to manage its local supplies and supply reliability. **As the impacts of climate change become more apparent, LBWD desires to increase and maximize local supply production and reliability and decrease reliance on imported supplies, which will be made possible with the implementation of the Project.**

LBWD has the groundwater rights to meet approximately 60% of its demand through groundwater pumped from the Central Basin- one of the most critical groundwater basins in the western states. By the mid-1900’s, the Central Basin was seriously over-drafted, which led to its adjudication in the early 1960’s, which provided the framework for managing the Basin by apportioning pumping rights. LBWD has the rights to pump 32,693 acre-feet per year (AFY) of groundwater from the Central Groundwater Basin Aquifer. However, it has been unable to actually utilize that full groundwater supply due to its limited management capacities that will be greatly improved by the Project. In addition, LBWD has stored water accounts and is in the process of developing groundwater augmentation projects to increase its allowable pumping allocation (APA). **The complexity of the groundwater management in this Basin and the conflicts resulting from the increasing demand makes this Tool a necessity for LBWD improve modeling and forecasting capabilities and allow LBWD to maximize its groundwater withdrawal in the most efficient manner.**

*2. Explain how your project will address the water management issues identified in your response to the preceding bullets and provide support for your response. For example, will your project improve water management by supporting:*

**a. Water supply reliability:** LBWD currently utilizes available databases (e.g., Microsoft Excel) to record and forecast groundwater production, then generates forecasting through a multi-step process using hand calculations and generic assumptions. This does not allow for the most accurate results, nor is it possible to efficiently manage or plan for adequate water production for even a few months into the future. The Project’s new digital Tool will instantaneously collect data to forecast well production for 12-month, 5-year and 10-year periods, which will **allow LBWD to maximize use of the underlying groundwater basin, which could be drawn upon under any water supply condition, including dry years when imported supplies may not be available.** This will **increase the water supply reliability** regardless of variations in well productivity and disruptions, or even more global impacts such as drought and climate change.

**b. Management of water deliveries:** With the **improved information generated by the Tool, LBWD can more effectively manage local and imported water deliveries** by enhancing understanding of its groundwater capabilities. The new system **will connect all of LBWD’s water system components to provide a wholistic management approach in real time and on a**

long-term basis, resulting in **more cost-effective water management practices**. Use of less expensive supplies will **reduce LBWD's water supply costs** and minimize rate increases for its customers, resulting in **improved management of fiscal resources**.

**c. Water marketing activities:** Improved access to and use of accurate water resources data will be used to inform water management decisions and also **better facilitate water marketing activities and opportunities to a broader set of audiences** within the Basin, including the other local water agencies, MWD, WRD and the general public.

**d. Drought management activities:** More accurate hydrologic information (concerning groundwater storage and banking capabilities) provided by the digital Tool will **improve drought management**. LBWD has a current Water Shortage Contingency Plan with robust mitigation measures that can be implemented during various scenarios of droughts conditions. **Once a drought is detected or forecasted, and LBWD selects a set of mitigation measures, the Project Tool will generate the data necessary to appropriately allocate and supply water from the various sources**, thereby maximizing groundwater storage and bank water during wet years for use during dry years, which will also **increase drought resiliency**.

**e. Conjunctive use of ground and surface water:** the Project's new system will provide LBWD with a wealth of accurate data, as well as short term and long-term reports to **enable more efficient planning and management, not only for implementation of maintenance and new infrastructure projects, but also for the right balance and conjunctive use between groundwater and surface water**. This will help to optimize/increase the use of groundwater (a more sustainable and local supply), thereby decreasing the reliance on imported surface water from the Colorado River and/or SWP.

**f. Water rights administration:** One of the main modules of the Project Tool is the forecasting model and its water rights balance accounting. LBWD currently has the rights to pump 32,693 AFY of groundwater from the Central Basin Aquifer; without the sophisticated groundwater management tools that will be provided by the Project, actual pumping often falls short of this allocation due to unforeseen failures of existing wells and inability to foresee the need for rehabilitation. The Tool will provide the necessary triggers and information concerning the wells to optimize well production, thereby **allowing LBWD to better manage and administer its water rights and resources to maximize its allowable pumping allocation (APA), resulting in reduced** dependency on more expensive and scarce imported water supplies.

**g. Ability to meet endangered species requirements:** In 2008, the Fish and Wildlife Service issued a biological opinion which determined that the continued operation of the Central Valley Project and SWP was likely to jeopardize the existence of the Delta Smelt, a small fish that lives in the Bay Delta (source of SWP water) and adversely modify its critical habitat. Delta Smelt, among other endangered species, are adversely affected by exportation of fresh water from the Delta for SWP use. Delta water salinity levels continue to increase, without sufficient freshwater replenishment. For example, recent population samples, in an area which typically yielded 50 to 100 smelt now presents only six fish, with increased water salinity cited as a major

contributing factor. The Project will develop a Tool that will enable LBWD to maximize its production from its ground water wells, thereby reducing its reliance on imported water, including that sourced from the SWP. Reduced reliance on imported water from the SWP resulting from **the proposed Project will contribute to preserving the endangered Delta Smelt habitat and help protect other vulnerable species** that rely on imported water from the SWP.

**h. Watershed Health:** By increasing LBWD’s understanding of its groundwater usage, the proposed Project further ensures the District’s capability to forecast the required imported water flows and reduce the amount of purchased water based on these predictions. The Project **Tool will provide a wealth of data with respect to the watershed**, that LBWD could share with WRD, the Water Master of the Central Basin watershed. Since LBWD is one of the largest pumpers in the Central Basin, this proactive action by LBWD will improve watershed conditions and avoid action that might result in detrimental effects to the health of the watershed.

**i. Conservation and efficiency:** The powerful Project Tool will enable LBWD to make better informed operational decisions for **greater system efficiency**. It will optimize and make **efficient use of ground water supplies** to reduce reliance on imported water. In this manner, the **Project will support and promote conservation** of vulnerable imported water supplies.

*3. Describe to what extent your project will improve water management. Describe the significance or magnitude of the benefits of your project, either quantitatively or qualitatively, in improving water management, with supported details.*

Either directly or indirectly, the Project will benefit all of the water management objectives previously listed in the previous question by providing the accurate data and forecasting details needed for improved and more efficient system management as described below.

**Water Supply Reliability, Conservation and Efficiency:** The volatility of imported water supplies throughout Southern California is at an all-time high, with heightened competition for limited supplies increasing, particularly during times of drought. The Project **increases water supply reliability** by providing new information that will allow LBWD to **efficiently maximize its use of the underlying groundwater basin** and keep **wells operating more efficiently through a robust maintenance plan**. Through improved wellfield management and forecasting, the Project will **conserve imported water supplies**, thus increasing the reliability of water supplies regardless of weather patterns, increasing the community’s resiliency **against drought and climate change**.

**Management of Water Deliveries and Efficiency:** The Tool will allow LBWD to **more efficiently manage water deliveries**, thereby reducing its reliance on limited and expensive imported supply. The Projects’ **greatly improved modeling and forecasting capabilities** will also enhance WRD’s understanding of its groundwater extraction capabilities, which will improve water supply management and increase flexibility in current and future water operations, resulting in

better management and efficiency of water supplies. More specifically, the Project **will allow LBWD to maximize its allowable pumping allocation.**

**Water Marketing Activities:** The Tool will improve data delivery by making data available and relatable to multiple audiences both within LBWD (Engineering, Operations, Water Resources) as well as to a broader audience (e.g., MWD, WRD, Basin pumpers). Improved access to and use of water resources data will not only be used to better inform water management decisions, but also offers water marketing activities and opportunities to these broader audiences. Interagency cooperation would be much more effective with accurate, relative data and would better facilitate reaching an agreement. Additionally, imposing water restrictions on customers during drought conditions would be more compelling when supported by accurate data.

**Drought Management Activities:** Drought Management has never been more critical in Southern California; 2014 was one of the driest years in California’s recorded history. In 2015, a State of Emergency was declared by the governor and California’s first set of statewide mandatory water restrictions were announced. According to the CA Drought Monitor and based on 2021 water conditions, federal and state water managers announced water shortages throughout the State and the entire western United States which would greatly reduce LBWD’s ability to receive imported water from MWD. For the first time, the Department of the Interior declared a Tier 1 Shortage on the Colorado River due to the hydrologic conditions in the Colorado River Basin. The limited availability of these imported supplies emphasizes the need for LBWD to optimize its use of local water supplies. These ongoing environmental changes have dramatically affected the imported water supplies which LBWD shares with over 300 other cities, all of whom are faced with the same dilemma.

In 2020, LBWD relied on imported water to meet 40% of its demand. Imported water supplies are projected to decrease in the next two decades. Through improved water management, the **Project will optimize and expand LBWD’s use of local water resources, reducing its dependency on limited and expensive imported water, providing a buffer against drought and climate change,** and freeing up supplies for other users and uses such as wildfire fighting.

**Conjunctive Use of Ground and Surface Water and Watershed Health:** The Project’s Well Asset and Groundwater Management and Forecasting Tool will open conjunctive use opportunities by improving groundwater production planning, management, and delivery of water to the distribution system; and **by incorporating groundwater modeling** in relationship to basin health and management. This will allow LBWD to **find the right balance between surface water and more sustainable groundwater** use now and into the future. **LBWD can then better manage its resources to maximize its APA, resulting in** reduced dependency on more expensive and scarce imported surface water supplies.

**Water Rights Administration:** Transparency in water rights usage and administration will be an added benefit of the Project, as the Well Asset and Groundwater Management and Forecasting Tool will provide thought sharing of expanded/enhanced data to a broader audience, allowing for better informed and more comprehensive administration and decision making. Water rights administration is one of the important components of the Project Tools database and model.

**Ability to meet endangered species requirements:** Water from the SWP is pumped from the Sacramento - San Joaquin Delta, which threatens the Delta Smelt fish. Any reduction of pumping SWP water (a benefit of the proposed Project) will incrementally lessen the detrimental impact on the biology of the Delta, including the endangered Delta Smelt fish. Reduced reliance on imported water from the SWP will contribute to preserving the endangered Delta Smelt habitat and help protect other vulnerable species that rely on imported water from the SWP.

4. *Explain how your project complements other similar efforts in the area where the project is located. Will your project complement or add value to other, similar efforts in the area, rather than duplicate or complicate those efforts? Are there other similar efforts in the area that have used a similar methodology successfully which can be complimented?*

Typically, approximately 60% of LBWDs total potable demand has been supplied from the Central Basin which is managed, regulated, and replenished by the WRD. According to their annual report, their mission is *“to protect and preserve high quality groundwater in the Basins through innovative, cost effective, and environmentally sensitive management practices for the benefit of residents and businesses of the Basin...WRD maintains a thorough and current understanding of groundwater conditions in the Basin and strives to predict and prepare for future conditions...achieved through groundwater monitoring, modeling, and planning which provide the necessary information to determine the “health” of the basins. This information in turn provides WRD, the pumpers in the district, and other interested stakeholders with the knowledge necessary for responsible water resources planning and management.”*

WRD utilizes Modflow groundwater modeling and is the official Groundwater Level Monitoring Entity for the Basin. The Project will compliment this groundwater modeling and add value to WRD’s efforts by providing the necessary information to help achieve their goal to *“maintain a thorough and current understanding of groundwater conditions in the Basin and strives to predict and prepare for future conditions”*. WRD produces an annual Regional Groundwater Monitoring Report. The Project will compliment and provide valuable information to WRD for inclusion in this report, thereby enhancing the studies and reporting by WRD, as well as the goals of California’s Sustainable Groundwater Management Act (SGMA).

Additionally, the Project compliments the 2015 City of Long Beach [Climate Resiliency Assessment Report](#) which concluded that the top threat of climate change to the Long Beach

area is the occurrence of droughts, and recommends that the City take action to increase the climate-resiliency of its freshwater supply. The City of Long Beach is also a member of the Los Angeles Gateway Integrated Water Management Authority (Gateway Authority), which is a joint powers authority under California Law was formed for the purpose of developing a detailed integrated regional water management plan for the Gateway area and to assist the region in other water related matters. The Project will reduce the City’s reliance on imported water, making them available to others in the Alliance and complimenting their efforts.

As evidenced by their support letter, this Project also aligns with MWD and goals of the LBWD Urban Water Management Plan to address adopted policy principles on climate change. This includes supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply, which is exactly the goal of the proposed Project. The Project will generate more accurate, higher quality information for mutual use by LBWD, WRD and MWD; assisting local water management, and complimenting the efforts of WRD and MWD by improved management of the regional supply and demands.

**Evaluation Criterion B—Need for Project and Applicability of Project Results (20 points)**

*Will the project result in an applied science tool(s) or information that is readily applicable, and highly likely to be used by water resource managers in the West? Explain who has expressed the need and describe how and where the need for the project was identified.*

**The Project will immediately result in an applied science tool and information that is readily applicable and will be enthusiastically used by water resource managers in the West, likely to generate significant local interest.** As a member of the Gateway Authority, LBWD regularly participates in regional meetings where new developments are discussed. Representing the second largest City in Los Angeles County, LBWD will share the Project results, benefits, and lessons learned with other agencies. The City of Lakewood will benefit directly from this Project, as there is an existing agreement that allows LBWD to use the City of Lakewood’s infrastructure for extraction of additional water under the LBWD’s water rights limitations.

The Project is also expected to generate **regional interest**. Approximately 60% of LBWDs total potable demand is historically supplied from local groundwater from the Central Groundwater Basin (“Basin”). WRD manages the Basin and **has approached LBWD and expressed interest in participating in the development of the Project**. LBWD will coordinate with WRD for modeling the impacts to the groundwater basin and improve basin management. The Project will generate higher quality information and will assist WRD to better manage the regional supply and demands, which will be a great contribution to the region.

Project results will ultimately be used as a water budget tool to help LBWD provide monthly and long-term estimates of groundwater pumping, which will help facilitate groundwater and imported water supplies’ management planning. In addition, it will help LBWD respond to



unforeseen production events (i.e., wells out of service) to maintain groundwater production targets and supplies management and to improve management of its groundwater wells and operations. The critical need for this **tool is consistent with the goals of the recent 2020 LBWD Urban Water Management Plan (UWMP, 2020), City of Long Beach Climate Resiliency Report, and most recently, LBWD’s first Water Resources Plan (WRP), which was adopted in 2019 “to provide a long-term water resources strategy that meets specified objectives and adapts to changing future conditions such as: threats to local groundwater and imported water; regulatory requirements; and climate change. **The Project is a result of a recommendation of LBWD’s 2019 WRP** and will expand upon the plan that identifies LBWD’s goal to achieve local supply independence by increasing groundwater production, which will be made possible with the more accurate water demand modeling and forecasting the will result from implementation of the Project.**

The Project also aligns with MWD and LBWD’s planning activities listed in the LBWD UWMP to address adopted policy principles on climate change. This includes supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply, supporting flexible “no regret” solutions that provide water supply and quality benefits, as the Project will provide. In addition, the 2015 City of Long Beach Climate Resiliency Report concluded that droughts are the top threat resulting from climate change. The Report recommended that the City take action to increase resiliency of its freshwater supply, which the Project will provide through improved management of its groundwater wells and operations, which will “offset the need to purchase expensive imported water.”

*Who will be involved in the project as project partners? What will each partner or stakeholder’s role in the project be? How will project partners and stakeholder be engaged in the project and at what stages?*

LBWD is the Applicant but is just one of the 30 other water agency members of the Gateway Water Management Authority that will benefit from the Project, and only one of the 300 cities and 19 million people in six counties represented by MWD. As previously noted, MWD is very interested in the Project and the results of this effort will be coordinated for its regional use. Additionally, results of the Project will be provided to all “stakeholders” identified in the WRP which includes representatives from the following agencies: Port of Long Beach; Surfrider Foundation; California State University, Long Beach; Apartment Association, California Southern Cities; Habitat for Humanity of Greater Los Angeles; and the Association of Professional Landscape Designers. Each of the above beneficiaries, could be considered a stakeholder or even a Project “partner” as the Project will provide critical data to improve local and regional water resource management actions and decisions allowing for improved coordination with the WRD for regional monitoring and planning purposes, and to assist MWD with statewide planning efforts.



*Will the results of your project inform water resource management actions and decisions immediately upon completion of the project, or will additional work be required?*

Immediately upon completion, the Project will provide information to enhance management actions and decisions by: improving forecasting to enhance management of water supplies and operations; improving access to and use of water resources data to inform water management decisions; improving delivery by making data available and relatable to multiple audiences (LBWD Engineering, Operations, Water Resources); allowing coordination with WRD for regional monitoring and planning purposes; and providing short-term and long-term forecasting of imported water needs to assist MWD with statewide planning efforts.

*If applicable, will the results of your project be transferrable to other users and locations? Note: not all water management solutions are transferrable.*

Besides LBWD, the Project will provide critical data to be made immediately available and directly transferable to WRD and other users. Project deliverables include a Well Asset Management Tool, digital Water Model Audit, Well Maintenance Plan and Final Report. The Tool will be integrated into LBWD's server systems to provide a "single source of truth" to view and manage the various components of each well site and support annual Performance Audits. Project results will be freely shared/transferred electronically (password protected) by LBWD to water resources managers and "stakeholders" including those identified above.

### **Evaluation Criterion C—Project Implementation (20 points)**

*1. Briefly describe and provide support for the approach and methodology that will be used to meet the objectives of the project.*

In February 2022 the LBWD Board of Water Commissioners approved the execution of an Agreement with Stanley Consultants, Inc. to provide professional services for the Well Asset Management Project in an amount not to exceed \$571,318. Their proposal offered continuous asset integration without interfering with the system operation, keeping the platform as a "twin" of the physical assets, while upgrading the functionalities and opening data access to operators and management. Their approach and methodology are summarized as follows:

1. Review and document existing data and existing data collection practices.
2. Provide detailed recommendations regarding expanding existing data collection practices and usage, data gap analysis, reporting criteria, production forecasting approach and methodology and development of triggers or decision-making criteria.
3. Conduct and document a needs assessment and identify potential gaps between the Project objectives, current practices, and existing data.
4. Develop the new Tool with a dashboard to include historical groundwater production, water rights balance accounting, suction break water levels, specific capacity decline rates, rate of flow reduction per well, well efficiency, and other data related to operational performance for preventative maintenance and operation and individual well performance.
5. Certified hydrogeologist to provide groundwater production analysis/forecasting work.

6. Use Tool to complete a comprehensive Well Performance Audit.
7. Based on Audit, develop a Well Maintenance/Management Plan
8. Train LBWD staff on using all aspects of the Tool and provide a training manual.

Initial work would use an Applied Science Forecasting Approach, in conjunction with existing hydraulic and groundwater modeling to develop the Tool that will be used to improve management of groundwater wells and operations, and for water budget purposes that will help LBWD provide monthly and long-term estimates of groundwater pumping to facilitate improved groundwater and surface water (import supplies) management planning. The Tool will be used to annually conduct the annual Audit and update the Maintenance Plan.

*2. Describe the work plan for the proposed scope of work.*

Table 1. Project Schedule

Project Schedule			
No.	Task/Milestone	Duration (Months)	Completion Period
1	Funding Award Announcement & Reclamation Agreement Process	4	July - November 2021
2	Advertise RFP for Consultant Contracts	2	January 2022
3	Award Contract	2	March 2022
4	Begin Project (Consultant)-75% Draft	6	September 2022
5	Attend Webinar with BOR	1	October 2022
6	Submit 90% to City	2	December 2022
7	Incorporate all comments	2	February 2023
8	Testing & Training	2	April 2023
9	Begin implementation and Share data	ONGOING	
<b>Estimated Total Project Period</b>		<b>17 Months</b>	

*3. Provide a summary description of the products that are anticipated to result from the project. These may include data, metadata, digital or electronic products, reports, and publications. Note: using a table to list anticipated products is suggested.*

Project will develop the tools and procedures necessary to effectively monitor well field operations, assess critical factors affecting current and future production, and provide the foundations for intelligent decision-making regarding operation and maintenance of each well.

Project goals have been established to produce the following deliverables:

- A working **digital management database and Tool** of the Long Beach groundwater supply system that will provide improved management of historical pumping, accurately forecast future pumping, and provide an operations roadmap
- A **Well Asset Management Plan**, developed with the assistance of the digital Tool, to allow LBWD to meet its water quantity goals and reliably forecast future aquifer pumping.

- A **Report** summarizing the development of the digital Tool that captures needs assessment, existing data, approach/methodology, and summarizes efforts.
- Utility **staff training** (and training manual) in the use and improvement of the digital Tool
- Completion and presentation of the first annual (well performance) **Water Audit**

4. *Identify staff with appropriate credentials and experience and describe their qualifications. Describe the process and criteria that will be used to select appropriate staff members for any positions that have not yet been filled. Describe any plans to request additional technical assistance from Reclamation or via a contract. Please answer the following:*

Stanley Consultants, Inc will be managed by LBWD Project Manager Heather Rhee, PE, who is one of two current LBWD water resources staff engineers with who will have full availability to manage this project. Ms. Rhee has a Master of Science degree in Civil Engineering and is a registered Professional Engineer in the State of California. She has worked with several water agencies and has an in-depth understanding of water systems operations and management. She is the responsible Project Manager for the LBWD and the lead for long-term water resource planning studies, having also been responsible for the 2020 UWMP and the departments System Optimization Plan (SOR). In addition, Ms. Rhee has been tracking local and regional hydrology and potential impacts to water supply conditions and communicates this information directly to LBWD's managers and other partnering agencies. An Assistant Engineer and subject matter experts including engineers, and operations crews that are familiar with LBWD system will assist her. There are no plans to request additional technical assistance from Reclamation. Dedicated LBWD staff will work closely with the professional team provided by Stanley Consultants, Inc. and their subconsultant GoAigua who is a global water solutions company specializing in software and analytics for water and wastewater utilities, with offices in more than 10 countries. GoAigua is now helping over 400 utilities to navigate their digital transformation with their solutions and data science capabilities. Brief summaries of consultant team are listed below with resumes included in Section E of Stanley Consultants' Proposal (Appendix C):

**Project Manager and Point of Contact: Patrick Haney, PE.** Registered Professional Engineer in the State of California, with over 20 years of water and wastewater engineering, operation, and planning experience designing complex infrastructure solutions. Vast experience assessing, planning, designing, and commissioning water system infrastructure, with a “proven ability to keep projects on schedule, within budget, and delivered with exceptional quality.”

**Technical Leads: Larry Thomas, PE, BCEE and Frank Johns, PE.** Both are Registered Professional Engineers with over 44 years of experience each. Mr. Thomas is a recognized leader with AWWA awards for his dedication to the water industry. Mr. Johns has spent extensive time working on Calif. groundwater challenges and infrastructure improvements.

**KYLE Groundwater: Hydrogeologist: Russell Kyle, PG, CHG** is Calif. Registered Professional Geologist and Certified Hydrogeologist and is Project's main hydrogeologist, Mr. Kyle has more

than 24 years' local experience working in the greater Los Angeles area, and a voting member of the AWWA National Well Standards Committee. He specializes in assisting California utilities maximize their water production while protecting the long-term viability of the aquifers and helped to create LBWD's recently completed Well Maintenance Program, as well as other planning documents regarding groundwater production.

**GoAigua: Digital platform integrator** is the digital platform integrator, led by Mr. Pablo Calabuig, which have worked on similar projects around the world and have a proven ability to integrate data silos and predictive analytics to help clients make better data driven decisions. Mr. Calabuig led the integration of the GoAigua digital platform in major cities both in the US and globally. As with these projects, Mr. Calabuig will bring his team of IT implementation and data science experts to ensure that the startup process is seamless for the LBWD.

*a. Have the project team members accomplished projects similar in scope to the proposed project in the past either as a lead or team member?*

Yes, LBWD Project Manager Heather Rhee, PE has accomplished projects of similar scope for the City of San Francisco's Water Department's Capital Improvement Program Linear Asset Management Program; and the City of San Francisco's Sewer System Improvement Program. Additionally, as noted above, Ms. Rhee has been responsible for development of other LBWD plans such as the System Optimization Review (SOR) and 2020 UWMP. Stanley Consultants, Inc. has provided over 100 years of service in the water industry for both the private and public sectors, including well maintenance plan/production plan and asset management projects. GoAigua's "Big Data" Platform for Water and Wastewater is the product of 15+ years of digital transformation in water. It is currently collecting and analyzing over 10 billion data points in real-time every year.

Stanley Consultants, Inc. and their subconsultant GoAigua led by Mr. Pablo Calabuig have together worked on similar projects around the world, including the integration of the GoAigua digital platform, including Houston, TX; Chino, CA; Mexico City, Valencia (Spain) and Hong Kong. In fact, Mr., Calabuig personally led the implementation of GoAigua's Mexico City Well Optimization Project which is very similar in cope to the proposed Project.

*b. Is the project team capable of proceeding with tasks within the proposed project immediately upon entering into a financial assistance agreement? If not, please explain the reason for any anticipated delay.*

Yes, this is a priority project for LBWD, and the project team can proceed immediately upon entering into an agreement and completing it within 9 months.

**Evaluation Criterion D— Dissemination of Results (10 points)**

- *If the applicant is the primary beneficiary of the project, explain how the project results will be communicated internally, and to interested stakeholders and interested water resources managers in the area, if appropriate.*

The Project deliverables will be communicated to the Board of Water Commissioners during regularly scheduled public meetings. Internal stakeholders include water resources, operations, engineering, and finance groups (for budgeting/planning purposes regarding imported water purchases vs. groundwater production). LBWD has already begun communication with regional stakeholders such as WRD and other water users within the Central and West Coast Basins who have shown support and/or expressed interest in learning about the Project. Letters of support from some of these agencies including WRD and MWD are included in Section 7 of this application. LBWD will share the Project results with these agencies, as well as their positive impacts on management of the shared water basins. In addition to the digital Well Asset Management Tool, Project deliverables include a digital Water Model Audit, Well Maintenance Plan and Final Report.

LBWD staff will be fully trained (including workshops) on use of the Tool, which will be integrated into LBWD's on-premises server systems so that the Operations, Engineering, and Water Resources Groups have a "single source of truth" to view and manage the various components of each well site and serve as a critical tool for annual Performance Audits.

- *If the applicant is not the primary beneficiary of the project (e.g., universities or research institutes), describe how project results will be communicated to project partners and interested water resources managers in the area.*

LBWD is the Applicant and primary beneficiary of the Project, however it will benefit numerous other local and regional entities, including all members of the Gateway Authority, and "Gateway Regional Alliance," which will all benefit from the Project. The Project will reduce LBWD's reliance on scarce imported water supplies, benefitting all of these stakeholder organizations to some degree. As previously noted, MWD is very interested in the Project and the results of this effort will be coordinated for regional use. Project results will be provided to all "stakeholders" identified in the WRP which includes representatives from the Port of Long Beach; Surfrider Foundation; California State University, Long Beach; Apartment Association, California Southern Cities; Habitat for Humanity of Greater Los Angeles; and the Association of Professional Landscape Designers. Project results and data will be shared with stakeholders and other water resources managers with secure electronic access to the digital Tool.

- *Describe how the project results will be shared with other water managers in the West that could use the information to support water management objectives.*

One of the main benefits of this Project is the enhanced coordination with WRD and its 43 member agencies, to improve regional monitoring and planning, as well as short and long-term forecasting of imported water needs to assist MWD and its 26 member agencies with statewide planning efforts. The Project Tool will store and integrate historical data with new real time and manual data streams, providing users and water managers with a "single source of truth" for well and groundwater management information going forward. Results will be shared with other managers in the West via (secure) electronic access to the digital Tool.

## Evaluation Criterion E— Presidential Department of the Interior Priorities (10 points)

### Sub-criterion No. E1. Climate Change

1. *Please provide specific details and examples on how the project will address the impacts of climate change and help combat the climate crisis.*

The 2021 Science and Engineering to Comprehensively Understand and Responsibly Enhance (SECURE) Water Act Report recognizes that changes to temperature, precipitation (rainfall and snowfall), and the timing and quantity of snowpack and runoff pose a significant challenge to the protection and use of water resources. On October 19, 2021, California Governor Gavin Newsom declared a statewide State of Emergency due to drought. This was followed by the MWD Board of Directors also declaring a drought emergency in Southern California on November 9, 2021. The Project will allow LBWD to increase and maximize its groundwater withdrawal in a sustainable and reliable manner, thus reducing its reliance on MWD imported water supply and helping to build long-term resilience to drought and **mitigate the impacts of climate change**. By reducing its dependence on imported water, the proposed Project helps to **reduce natural hazard risks to our lands** such as wildfires, by making those natural water resources (e.g., water supplies from the Colorado River Aqueduct and SWP) more readily more available for responding to natural hazard risks such as wildfires statewide.

The Project is consistent with the 2020 Urban Water Management Plan (and its Drought Risk Assessment) and the 2015 Climate Resiliency Assessment Report, which consider **climate change resilience**. The Project provides benefits that are consistent with many of the UWMP **strategies to mitigate climate change impacts** including the following: reduce water demand, improve operational efficiency and transfers, increase water supply, improve water quality, practice resource stewardship, support long term and regional water management planning, aggressively increase water use efficiency and expanding water storage and conjunctive management. The Project is also consistent with the 2019 WRP, whose recommendations included “**focus on monitoring climate change impacts** and local groundwater basin health” and to “work with WRD and MWD to **monitor impacts of climate change** on imported and local groundwater supply.”

According to the Centers for Disease Control and Prevention (CDC), severe drought conditions can negatively affect air quality. increasing risk for wildfires and dust storms. By reducing its dependence on imported MWD water and making those supplies more available to mitigate drought impacts (firefighting, irrigation, etc.) the proposed **Project can help to reduce air pollution** and reduce **resulting detrimental effects on air quality, improving public health**. Additionally, the Project’s pumping of groundwater will **generate lesser greenhouse gases** than the alternative imported water supply, which will also reduce air pollution.

2. *Does the proposed project strengthen water supply sustainability to increase resilience to climate change?* Yes. The Project will increase LBWDs groundwater pumping capacity, thereby



**decreasing its reliance on imported water**, including that sourced from the Colorado River and the SWP. This will make these imported supplies available to other communities and can also **provide flexibility to minimize water shortages**, mitigate the impacts of acute and chronic events, and further increase **resilience to climate change**.

3. *Does the proposed project contribute to climate change resiliency in other ways not described above?* Yes. The Project supports the goals of the Climate Resiliency Assessment Report and contributes to climate change resiliency by increasing the use of locally supplied water resources, which have a **lower carbon footprint and decreased greenhouse gases** than importing water. In addition, given the size, population demographics, infrastructure, geographical location, regional economic impact, and leadership of the City of Long Beach, the Project has the opportunity to become a **model of climate change resiliency** for other agencies.

***Sub-criterion No. E2. Disadvantaged or Underserved Communities***

1. *Please describe in detail how the community is disadvantaged or underserved based on a combination of variables that may include the following:*

- *Low income, high and/or persistent poverty:* According to the 2020 US Census, the City of Long Beach California had a poverty rate of 16.83% compared to the US average of 11.4%. In 2022, the [City of Long Beach Economic Development Department website](#) identified an “Opportunity Zone” as an economically-distressed community which have been nominated for that designation by the state and certified as such by the Secretary of the U.S. Treasury. There are 19 census tracts in the City of Long Beach that have been identified as Opportunity Zones.
- *High unemployment and underemployment:* In May 2020, The U.S. Bureau of Labor Statistics (BLS) reported that the U.S. unemployment rate was 13%. Long Beach’s unemployment rate reached a high of 19% in May 2020.
- *Racial and ethnic residential segregation, particularly where the segregation stems from discrimination by government entities:* An August 2020 report by the City of Long Beach Office of Equity titled “[Racial Equity and Reconciliation Initiative](#)” states that “while federal, state and city laws have ultimately stopped outright systemic housing discrimination, redlining’s legacy endures. With segregation remaining in the city and black people today facing the consequences — including poorer health compared to their white colleagues.”
- *Linguistic isolation:* According to the 2020 US Census, 33% of adult (over 18) Long Beach residents speak only Spanish at home; approximately 20% higher than the state of California (28%).
- *High housing cost burden and substandard housing:* The Long Beach community experiences a high housing cost burden. According to the 2020 US Census, between 2015-2019, the median gross rent in Long Beach was \$1,324, which is nearly 25% greater than the US median gross rent of \$1,062 during that same time period.
- *Distressed neighborhoods:* The majority of census tracts in the City of Long Beach scored 70% or higher with many tracts being scored in the 91-100% range, representing neighborhoods of lesser social, economic, and environmental factors. According to the Long Beach Post newspaper, the greater scores also correlate to higher levels of air pollution. Census tracts located in North Long



Beach, particularly along the 91 Freeway, scored 99 points, suggesting the community is categorized as living under unsafe levels of pollution. Similarly, census tracts in West Long Beach near the 405 and 710 Freeways scored 87 points

- *High transportation cost burden and/or low transportation access* According to the [World Population Review website](#), Calif. has the highest transportation cost index (132.4), largely due to the highest gasoline prices in the country. In 2021, the “transportation cost of living” for the Los Angeles area was 165.3; compared with 132.4 for the state of California and the average of 100 for the USA. This means that in the Los Angeles area (including the City of Long Beach) the high transportation cost burden is greater than other places in the state and country.
- *Disproportionate impacts from climate change:* A recent EPA analysis shows that the most severe harms from climate change fall disproportionately upon underserved communities who are least able to prepare for, and recover from, heat waves, poor air quality, flooding, and other impacts. EPA’s analysis indicates that racial and ethnic minority communities are particularly vulnerable to the greatest impacts of climate change. [This peer-reviewed report](#) shows the degree to which four socially vulnerable populations— defined based on income, educational attainment, race and ethnicity, and age—may be more exposed to the highest impacts of climate change. The report quantifies six types of impacts, including those to health from changes in air quality and extreme temperature, disruptions to weather-exposed workers, and flooding threats to property

***President Biden recently issued Executive Order 14008:***

*High energy cost burden and low energy access:* Long Beach, CA is the 43rd largest city in the nation by population and is in the top 3% of the most expensive cities in the world.

- *Jobs lost through energy transition:* According to a June 2021 University of Massachusetts report titled, “A Program for Economic Recovery and Clean Energy Transition in California”; about 112,000 people are employed in California in fossil fuel-based industries, amounting to about 0.6% of the state’s total workforce in 2019, and that about 3,200 workers per year will be displaced in these industries in Calif. between 2021 – 2030. Three counties in Calif.—Kern, Contra Costa, and Los Angeles—account for roughly half of all employment in the state’s fossil fuel-based industries
- *Access to healthcare:* According to the 2018 [California Health Interview Survey](#) by the University of California, Los Angeles (UCLA) Center for Health Policy Research (the nation's largest state health survey), 21.3% of adults in Long Beach delayed or had difficulty receiving health care.

***2. Please describe how and the extent to which the proposed project will serve or benefit a disadvantaged or historically underserved community.***

LBWD serves water to the City of Long Beach, CA. which has been defined (see above) as a Disadvantaged Community. The Project supports this disadvantaged community by providing it with local, reliable, and more cost-effective water supplies, thereby allowing these residents to enjoy lower cost water bills. In addition to reducing costs, the proposed Project will provide significant benefits to this disadvantaged community, including enhancing public health, generating economic savings, and creating economic growth opportunities.

## SECTION 3: PROJECT BUDGET

### *Funding Plan and Letters of Funding Commitment*

LBWD will fund the entire non-federal cost share portion of the Project through monetary contributions. As shown in the official resolution in Section 8 of this application, LBWD is committed to providing the remaining matching funds to complete this project.

### *Budget Proposal*

Table 2. Summary of Non-Federal and Federal Funding Sources

FUNDING SOURCES	AMOUNT	PERCENTAGE
<b>Total Project Cost</b>	<b>\$579,848</b>	<b>100.0%</b>
LBWD	\$379,848	65.5%
<b>Non-Federal Subtotal</b>	<b>\$379,848</b>	<b>34.5%</b>
<b>REQUESTED RECLAMATION FUNDING</b>	<b>\$200,000</b>	<b>34.5%</b>

Table 3. Total Project Cost Table

SOURCE	AMOUNT	PERCENTAGE
Costs to be reimbursed with the requested Federal funding	\$200,000	34.5%
Costs to be paid by the applicant	\$379,848	65.5%
Value of third-party contributions	\$0	0%
<b>TOTAL PROJECT COST</b>	<b>\$579,848</b>	<b>100.0%</b>

Table 4. Budget Proposal

Budget Item	Computation		Quantity Type	Total Costs
	\$ / Unit	Quantity		
<b>Salaries and Wages</b>				
Heather Rhee (Project Manager)	\$ 59.82	80	Hours	\$ 4,786
<b>Fringe Benefits</b>				
Heather Rhee (Project Manager)	\$ 34.31	80	Hours	\$ 2,745
<b>Travel</b>				
N/A				
<b>Equipment</b>				
N/A				
<b>Supplies and Materials</b>				
N/A				
<b>Contractual</b>				<b>\$ 571,318</b>
Project Management and General Administration	\$ 70,100	1	LS	\$ 70,100
Report Development	\$ 143,305	1	LS	\$ 143,305
Asset Management Tool Development	\$ 186,428	1	LS	\$ 186,428
Well Performance Audit and Workshop	\$ 65,120	1	LS	\$ 65,120
Engineers Contingency	\$ 11,731	1	LS	\$ 11,731
Owner's Contingency	\$ 46,038	1	LS	\$ 46,038
Field Survey at Each Well Site	\$ 26,551	1	LS	\$ 26,551
Update Well Condition Asset Management Report	\$ 14,586	1	LS	\$ 14,586
Quality Reviews of Field Collection Data	\$ 7,458	1	LS	\$ 7,458
<b>Total Direct Costs</b>				<b>\$ 578,848</b>
<b>Indirect Costs</b>				
NEPA Environmental Review	\$ 1,000	1	LS	\$ 1,000
<b>Total Estimated Project Costs</b>				<b>\$ 579,848</b>

## Budget Narrative

### Salaries and Wages

The Project Manager for this Project will be Heather Rhee (who is a Civil Engineer at LBWD) throughout the Project implementation. She will be supported by LBWD personnel on an as-needed basis. Her hourly salary is \$59.82/hour, and it is anticipated that she will spend a total of 80 hours on various tasks for the duration of the Project.

### Fringe Benefits

The only fringe benefits associated with the Project are the fringe benefits received by the Project Manager, Heather Rhee. Her fringe benefits are \$34.31/hour, and it is assumed that she will spend a total of 80 hours on various tasks for the duration of the Project.

### Travel

All consultant travel expenses are covered within their contract which is listed in the “Contractual” section below.

### Equipment

Not applicable.

### Materials and Supplies

All consultant material and supplies expenses are covered within their contract which is listed in the “Contractual” section below.

### Contractual

LBWD awarded the contract to Stanley Consultants. The total costs associated with the development and procurement of the Well Asset and Groundwater Management and Forecasting Tool will be \$571,318. A detailed cost breakdown for each line item listed in Table 4 above can be viewed in Appendix D of this online submittal.

### Third-Party In-Kind Contributions

Not applicable.

### Environmental and Regulatory Compliance Costs

Not applicable.

### Other Expenses

Not applicable.

### Indirect Costs

The only indirect cost is the \$1,000 cost for Reclamation to perform its environmental review.

### Total Costs

The total Project cost is projected to be \$579,848.

## SECTION 4: ENVIRONMENTAL AND CULTURAL RESOURCES COMPLIANCE

*To allow Reclamation to assess the probable environmental and cultural resources impacts and costs associated with each application, all applicants should consider the following list of questions focusing on the NEPA, ESA, and NHPA requirements. Please answer the following questions to the best of your knowledge. If any question is not applicable to the project, please explain why. The application should include the answers to:*

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

The Project embodies the development and implementation of an Asset Management Tool (Tool) that will comply data such as water rights accounting, well construction information, static groundwater levels, pumping groundwater levels, instantaneous pumping rates, etc. from multiple sources into one database that will improve LBWD’s accuracy in groundwater forecasting. The Project is an administrative endeavor and therefore will have no impact on the surrounding physical environment. However, the improved groundwater forecasting provided by the Project is expected to reduce LBWD’s reliance on limited water supplies and encourage water conservation efforts. The health of the Project’s physical environment is the priority of this Project and therefore the surrounding environment will only experience positive impacts from the implementation of this Project such as increased water supply and reliability. No negative impacts to the soil, air, water quality, water quantity, or animal habitats in the Project area will occur.

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

The Project includes the development and implementation of an Asset Management Tool that will improve management of the LBWD’s groundwater operations and supply to reduce its reliance on expensive and limited imported water supplies. The Project is an administrative endeavor and no construction on physical land will take place. Therefore, the Project will have no impact on any species listed or proposed to be listed as a Federal threatened or endangered species or designated critical habitats.

- *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.*

The proposed Project is the development of an Asset Management Tool. The Project is strictly an administrative endeavor, and no construction will take place. Therefore, the Project will have no direct impact on surface waters that potentially fall under CWA jurisdiction as “Waters of the United States”, even if waters of this classification exist in the project boundary.

- *When was the water delivery system constructed?*

LBWD’s water delivery system that is a part of the proposed Project was originally constructed in the 1970’s. It has since been upgraded in the 1980’s and again in the 1990’s.

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

The Project involves the development and implementation of an Asset Management Tool. The Project does not include construction of any water infrastructure and is an administrative endeavor. Therefore, the Project will not result in any modification of or effects to individual features of an irrigation system.

- *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.*

The proposed Project is the development of an Asset Management Tool intended to improve management of LBWD groundwater wells and operations to reduce its reliance on limited and expensive imported supplies. As an administrative improvement, the Project itself will have no impact on any buildings, structures, or features in the irrigation district listed or eligible for listing on the National Register of Historic Places.

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

The Project involves the development of an Asset Management Tool intended to improve groundwater forecasting, operations, and management. There is no construction of any new infrastructure and there is no physical project site. The Project is an administrative investment and therefore there are no known archeological sites involved.

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

No, the proposed Project will only provide benefits, such as water security to low income and minority populations.

LBWD is responsible for managing all water supply within the City of Long Beach and covers a water service area of over 50 square miles including over 12,000 active customer accounts located in SB 535 Disadvantaged Communities. The Project will positively impact all resident of the City, including the disadvantaged communities throughout the City. The significance of this proposed Project is to support the LBWD's goal of less dependence on imported water, drought resiliency, and stretching water supply. The volatility of the imported water supply (and that of all Southern California) is at an all-time high, and the need to stretch water supply locally is paramount. Through improved management of water supplies that will result from the Project, the overall cost of the water supply will decrease, resulting in more sustainable supplies and rates for all customers, including the 12,000+ active customer accounts located in SB 535 Disadvantaged Communities in the LBWD service area. The Asset Management Tool that will be implemented as the result of this Project will improve local water reliability for LBWD's service area.

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

The Project is an administrative endeavor only and there is not an actual “project site.”

Therefore, the proposed Project will not limit access to and ceremonial use of Indian sacred sites or create any 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?*

The Project embodies only technologic administrative endeavors. No construction on a physical project site will occur. Therefore, the Project is not susceptible to the introduction, continued existence, or spread of noxious weeds or non-native invasive species.

## **SECTION 5: REQUIRED PERMITS OR APPROVALS**

*Applicants must state in the application whether any permits or approvals are required and explain the plan for obtaining such permits or approvals.*

There are no permit requirements for this Project.

## **SECTION 6: OVERLAP OR DUPLICATION OF EFFORT STATEMENT**

*Applicants must provide a statement that addresses if there is any overlap between the proposed project and any other active or anticipated proposals or projects in terms of activities, costs, or commitment of key personnel. If any overlap exists, applicants must provide a description of the overlap in their application for review.*

There are no overlaps associated with the implementation of this Project and other LBWD projects.



## SECTION 7: LETTERS OF PROJECT SUPPORT AND LETTERS OF PARTICIPATION



DIRECTORS  
JOHN D. S. ALLEN, PRESIDENT  
SERGIO CALDERON, VICE PRESIDENT  
VERA ROBLES DEWITT, SECRETARY  
ROB KATHERMAN, TREASURER  
JOY LANGFORD, DIRECTOR  
  
STEPHAN TUCKER, MBA, PE, PMP, GENERAL MANAGER

March 30, 2022

Ms. Avra Morgan  
Program Analyst  
Bureau of Reclamation, Water Resources and Planning Division  
P.O. Box 25007, 86-6300, Denver, CO 80225

**RE: Letter of Support for Long Beach Water Department's Well Asset and Groundwater Management and Forecasting Project for the Bureau of Reclamation Applied Science Grant**

Dear Mr. Morgan:

The purpose of this letter is to express the Water Replenishment District's support for the Long Beach Water Department's (LBWD) grant application for the Bureau of Reclamation's (USBR) FY 2022 Applied Science Grant Program. LBWD is submitting the grant application for their Well Asset and Groundwater Management and Forecasting Project (Project).

Long Beach is the second-largest city in Los Angeles County, with a population of half a million residents. Currently, LBWD's water comes from a combination of imported water and local groundwater extracted by wells located in the Central and West Coast Groundwater Basin. LBWD's groundwater collection system has the capacity to treat up to 62.5 million gallons of raw groundwater per day.

The severity of California's recent drought coupled with the extended dry period on the Colorado River and the projected long-term impacts of climate change underscore the need for continued diversification of Southern California's water resource portfolio. A major priority of LBWD is to maintain a reliable and resilient local groundwater source to address potential water shortages caused by extreme weather cycles that are features of California's climate.

LBWD's Project will improve groundwater production planning, management and delivery of water to distribution system and will provide flexibility in current and future water operations. Completion of this project will not only help LBWD, but it will have a significant impact on the optimum use of the groundwater basin that supports many other communities.

Given these reasons, I support the Long Beach Water Department's application for the FY 2022 Applied Science Grant Program and hope the application is selected to receive a grant.

Sincerely,



Esther Valle Rojas  
Manager of Watermaster Services, WRD



THE METROPOLITAN WATER DISTRICT  
OF SOUTHERN CALIFORNIA

Office of the General Manager

March 24, 2022

Ms. Avra Morgan  
Program Analyst  
Bureau of Reclamation  
Water Resources and Planning Division  
P.O. Box 25007, 86-6300  
Denver, CO 80225

Dear Ms. Morgan:

Re: Letter of Support for Long Beach Water Department's Well Asset and Groundwater Management and Forecasting Project for the Bureau of Reclamation Applied Science Grant

The purpose of this letter is to express The Metropolitan Water District of Southern California's (Metropolitan) support for the Long Beach Water Department's (LBWD) grant application for the Bureau of Reclamation's (USBR) FY 2022 Applied Science Grant Program. Long Beach is submitting the grant application for their Well Asset and Groundwater Management and Forecasting Project (Project).

In partnership with local water agencies, Metropolitan is a statewide leader in implementing water conservation programs and incentivizing resilient local water resources such as wastewater recycling, groundwater recovery and groundwater storage. Metropolitan has invested more than \$1.5 billion in these local resources, and our water agency partners, such as Long Beach, have invested many billions more.

The severity of California's current drought coupled with the shortage declaration on the Colorado River and the projected long-term impacts of climate change underscore the need for continued diversification of Southern California's water resource portfolio. Metropolitan's One Water strategy manages future uncertainties through an adaptive management approach designed to achieve reliability. This includes setting regional goals for sustainable local resources such as groundwater. Long Beach's Well Asset and Groundwater Management and Forecasting Project could help the region build resiliency to climate change and other uncertainties.

Metropolitan supports FY 2022 Applied Science Grant Program funding for the innovative Project, which would allow Long Beach to maximize the use of available local groundwater supplies.

Please contact Warren Teitz at (213)217-7418 or via e-mail at [wteitz@mwadh20.com](mailto:wteitz@mwadh20.com) if you have any questions.

Sincerely,



Brad Coffey  
Manager, Water Resource Management

## SECTION 8: OFFICIAL RESOLUTION



**Long Beach Water**  
Exceptional Water • Exceptional Service

APPROVED 03/31/2022  
BOARD OF WATER COMMISSIONERS

4

1800 E. Wardlow Road, Long Beach, CA 90807-4931  
562.570.2300 | lbwater.org

### Board of Water Commissioners

CHRISTOPHER J. GARNER, General Manager

March 31, 2022

#### Subject

Adopt Resolution No. WD-1459 authorizing the General Manager to sign and file all necessary documents associated with the application for the United States Department of Interior Bureau of Reclamation Fiscal Year 2022 WaterSMART: Applied Science Grants for the Well Asset and Groundwater Management and Forecasting Project.

#### Executive Summary

The United States Department of the Interior Bureau of Reclamation (USBR) WaterSMART program establishes a framework to provide Federal leadership and assistance to stretch and secure water supplies for the future. With WaterSMART Applied Science Grants, USBR provides cost-sharing funding on a competitive basis to develop hydrologic information and water management projects.

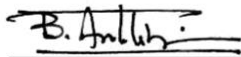
The Fiscal Year 2022 funding opportunity provides for awards up to \$200,000 with a 50 percent match. The funding opportunity was announced in February and applications are due on April 14, 2022. A resolution from the Board of Water Commissioners is required as part of the grant application.

Long Beach Water Department (LBWD) staff and LBWD's contracted grant consultant, Engineering Solutions Services, reviewed USBR's funding package and recommends LBWD apply for a grant to the Well Asset and Groundwater Management and Forecasting Project, an asset management project that will improve long term well operations, monitoring, and maintenance.

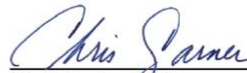
#### Recommendation

Adopt Resolution No. WD-1459 authorizing the General Manager to sign and file all necessary documents associated with the application for the United States Department of Interior Bureau of Reclamation Fiscal Year 2022 WaterSMART: Applied Science Grants for the Well Asset and Groundwater Management and Forecasting Project.

**Fiscal Impact:** If selected, up to \$200,000 in 50-percent matching Federal funds will be available per the agreement. The cost to the Water Fund will be incurred during FY 22 and FY 23 with the actual annual amounts unknown at this time, but the total amount will not exceed \$571,318. These costs are included in the Water Fund FY22 and FY 23 Budget and financial projections.



B. Anatole Falagan  
Assistant General Manager



Christopher J. Garner  
General Manager

Attachment



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RESOLUTION NO. WD-1459

A RESOLUTION OF THE BOARD OF WATER COMMISSIONERS OF THE CITY OF LONG BEACH AUTHORIZING THE GENERAL MANAGER TO SIGN AND SUBMIT ALL NECESSARY DOCUMENTS ASSOCIATED WITH THE APPLICATION FOR THE UNITED STATES DEPARTMENT OF INTERIOR, BUREAU OF RECLAMATION FISCAL YEAR 2022 WATERSMART WATER AND ENERGY EFFICIENCY GRANT PROGRAM: APPLIED SCIENCE GRANTS FOR THE WELL ASSET AND GROUNDWATER MANAGEMENT AND FORECASTING PROJECT

OFFICE OF THE CITY ATTORNEY  
CHARLES PARKIN, City Attorney  
411 West Ocean Boulevard, 9th Floor  
Long Beach, CA 90802-4664

WHEREAS, the United States Department of the Interior, Bureau of Reclamation (USBR) WaterSMART Water and Energy Efficiency Grant Program established a framework to provide Federal leadership and assistance to increase water conservation and improve the efficient use of water and energy; and

WHEREAS, with WaterSMART grants, USBR provides cost-sharing funding on a competitive basis to implement projects that will build long-term resiliency to drought; and

WHEREAS, in order for the Long Beach Water Department to receive and expend grant funding, the USBR requires the Board of Water Commissioners to adopt a resolution identifying the official with the legal authority to enter into an agreement with USBR, and authorize the official to commit the Long Beach Water Department to the financial and legal obligations associated with receipt of the WaterSMART Water and Energy Efficiency Grant Program Grant financial assistance;

NOW, THEREFORE, the Board of Water Commissioners of the City of Long Beach resolves as follows:

OFFICE OF THE CITY ATTORNEY  
CHARLES PARKIN, City Attorney  
411 West Ocean Boulevard, 9th Floor  
Long Beach, CA 90802-4664

1 Section 1. Approves and supports the filing of an application with the  
2 United States Department of the Interior, Bureau of Reclamation for Fiscal Year 2022  
3 WaterSMART Water and Energy Efficiency Grant Program: Applied Science Grants for  
4 the Well Asset and Groundwater Management and Forecasting Project, and further  
5 authorizes the expenditure of funds.

6 Section 2. Appoints the General Manager as agent of the Long Beach  
7 Water Department to conduct all negotiations and execute and submit all documents,  
8 including, but not limited to, applications, contracts, amendments, payment requests, in  
9 compliance with all applicable laws, which may be necessary for the completion of the  
10 aforementioned Project.

11 Section 3. Directs the General Manger to work with the USBR to meet  
12 established deadlines for entering into a cooperative agreement.

13 Section 4. This Resolution shall take effect immediately upon its  
14 adoption by the Board, and the Secretary to the Board shall certify the vote adopting this  
15 Resolution.

16 I hereby certify that this Resolution was adopted by the Board of Water  
17 Commissioners of the City of Long Beach at its meeting on  
18 March 31, 2022 by the following vote:

19  
20 Ayes: Commissioners: ROBERT SHANNON, GLORIA CORDERO,  
21 FRANK MARTINEZ, NAOMI RAINEY

22 \_\_\_\_\_  
23 Noes: Commissioners: \_\_\_\_\_

24 Absent: Commissioners: \_\_\_\_\_  
25 \_\_\_\_\_

26  
27   
28 Secretary  
Board of Water Commissioners

## SECTION 9: CONFLICT OF INTEREST DISCLOSURE

Per the Financial Assistance Interior Regulation (FAIR), 2 CFR §1402.112, applicants must state in their application if any actual or potential conflict of interest exists at the time of submission.

No actual or potential conflicts of interest associated with the implementation of this Project have been identified prior or during the time of submission of this application.

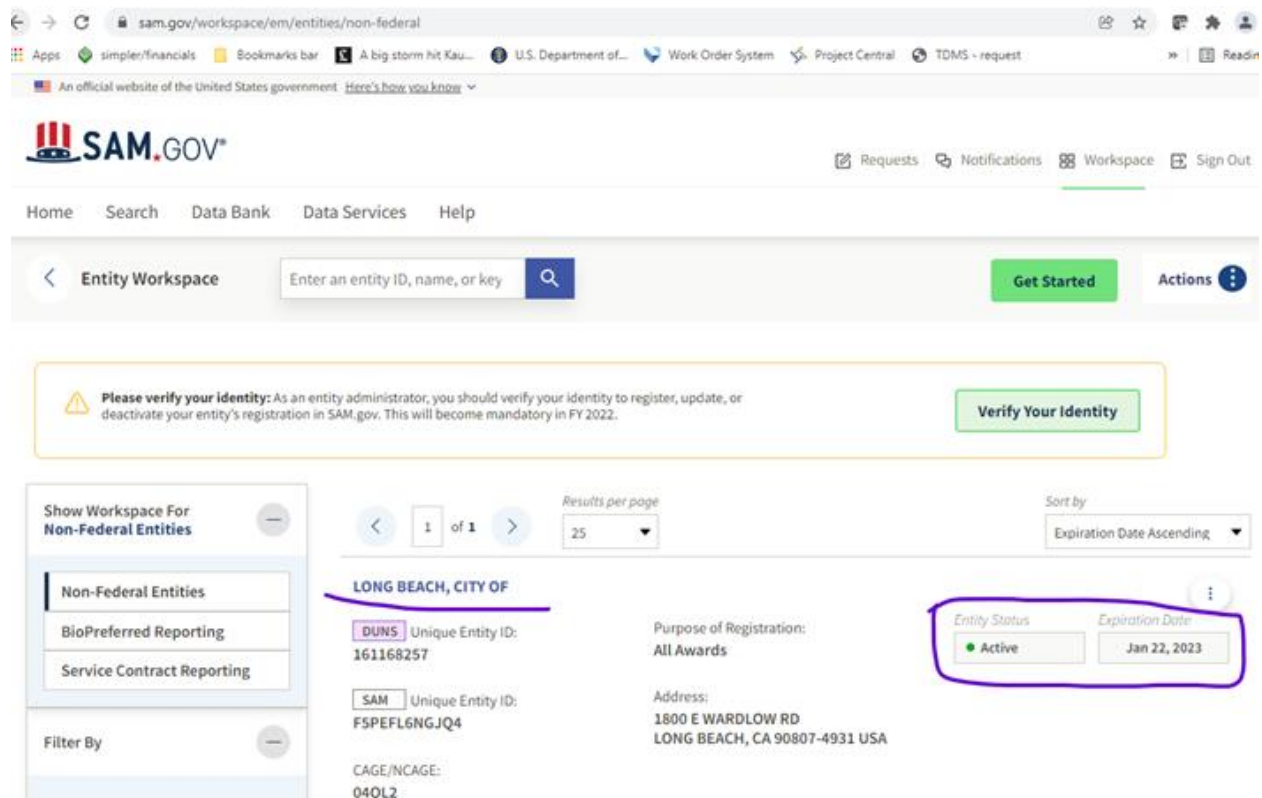
## SECTION 10: UNIFORM AUDIT REPORTING STATEMENT

LBWD acknowledges the requirement for a Single Audit report and has/will continue to comply with this requirement.

## SECTION 11: CERTIFICATION REGARDING LOBBYING

A SF-424 form is included with this application submission.

## SECTION 12: UNIQUE ENTITY IDENTIFIER AND SYSTEM FOR AWARD MANAGEMENT



The screenshot shows the SAM.GOV website interface. At the top, there is a navigation bar with the SAM.GOV logo and links for Requests, Notifications, Workspace, and Sign Out. Below this is a search bar with the text "Entity Workspace" and a search input field containing "LONG BEACH, CITY OF". A "Get Started" button and an "Actions" menu are also visible.

A yellow warning box contains the text: "Please verify your identity: As an entity administrator, you should verify your identity to register, update, or deactivate your entity's registration in SAM.gov. This will become mandatory in FY 2022." A "Verify Your Identity" button is located to the right of this box.

The main content area displays the entity details for "LONG BEACH, CITY OF". The entity is listed as "1 of 1" results. The details include:

- DUNS Unique Entity ID:** 161168257
- SAM Unique Entity ID:** FSPEFL6NGJQ4
- CAGE/NCAGE:** 04QL2
- Purpose of Registration:** All Awards
- Address:** 1800 E WARDLOW RD, LONG BEACH, CA 90807-4931 USA
- Entity Status:** Active
- Expiration Date:** Jan 22, 2023

The "Entity Status" and "Expiration Date" fields are highlighted with a purple box in the screenshot.

## **APPENDICES**

Appendix A: Additional Figures

Appendix B: Supplemental Information

Appendix C: Stanley Consultants, Inc. Proposal to LBWD

Appendix D: Stanley Consultants, Inc., Cost Proposal