

# Project Information Submittal Form

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**Project Submitter/Owner:** Borrego Water District

**Project Name:** Rams Hill Waste Water Treatment Facility Monitoring Wells

## Contact Information

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## Project Summary

**Please provide a summary of the Project description. Use as much space as you need.**

The Borrego Water District (BWD) owns and operates the Rams Hill Waste Water Treatment Facility (WWTF), which is a 250,000-gallons-per-day extended aeration (oxidation ditch) plant with evaporation/percolation ponds for disposal. The WWTF serves approximately 20% of the community of Borrego Springs, specifically the Rams Hill residential community and the Town Center area, which includes hotels and small businesses along Palm Canyon Drive. Several studies of the Rams Hill WWTF are ongoing per the recent amendment of the Waste Discharge Requirements (WDR) of the California Regional Water Quality Control Board Colorado River Basin Region Plan (R7-2019-0015). The goals of the studies are to determine the fate and transport of nitrogen and total dissolved solids originating from the discharge of effluent, document existing spare capacity of the facility and evaluate potential modifications to the treatment process. To date, BWD has prepared Regional Board approved Groundwater Monitoring Network Technical Report and Work Plan for the drilling and installation of six monitoring wells (three clusters of paired wells up to 100 feet in depth). The Project is currently completing CEQA and is almost ready to start the bidding phase. The Project has incurred \$75,000 through November 2021. Project completion anticipated by December 2022.

**Describe the project location, current conditions, and the benefitting areas. Please attach, separately, a regional and Project map depicting the site(s) location, current conditions, and benefitting areas.**

The Project location is entirely located within the Borrego Springs Subbasin (Basin) and within the service area of the BWD (Figure 1). The WWTF includes a treatment plant facility that is located on Assessor's Parcel Number (APN) 200-120-42, and evaporation/percolation ponds and a groundwater monitoring well that are located on APN 200-120-41 (Figure 1). The WWTF currently treats an annual average flowrate of 74,000 gpd—with low season (summer) flows down to approximately 20,000 gpd. Treated effluent from the Rams Hill WWTF is discharged into evaporation-percolation ponds. Given the desert location and dry, hot conditions a portion of the treated effluent is evaporated and a portion percolates into the aquifer. There is one existing monitoring well, WWTP-1, in the vicinity of the evaporation/percolation ponds that is part of the monitoring network for the Groundwater Management Plan (GMP). The well is equipped with a pressure transducer that records groundwater

levels at a sub-daily frequency and water quality is monitored semi-annually. Results indicate that seasonal mounding of water occurs in the vicinity of the evaporation/percolation ponds as a result of discharge of effluent. Sample results from WWTP-1 were below the drinking water maximum contaminant level (MCL) for all constituents of concern (COCs), with the exception of nitrate as nitrogen (as N), which has exceeded the drinking water MCL of 10 milligrams per liter (mg/L) for every recorded sample. The average nitrate as N concentration for samples collected from 2016 to 2019 is 27.8 mg/L. The Project will lead to better understanding of the fate and transport of nitrate and total dissolved solids in the aquifer. As the non-potable discharge will become part of the potable water in the aquifer, which provides drinking water for Borrego Water District customers, the Project will benefit ratepayers of the BWD and residents and tourists that frequent businesses in Town Center. The data will be used to assist with evaluation of treatment processes at the WWTF and potentially result in upgrades to the facility to lower nitrate concentrations in discharged effluent.

**What is the nexus of the Project to the Sustainability Goal of the Borrego Springs Subbasin Groundwater Management Plan (GMP)? Is the Project listed in the GMP? How does the Project help achieve the goals of the GMP?**

The Project is directly related to achieving the Basin's sustainability goal of SGMA to operate the Basin within its sustainable yield without causing an undesirable result by addressing water quality through evaluating point source discharges to the aquifer. If additional treatment processes at the WWTF are required to reduce nitrate loads and concentrations in effluent than the information gained from the Project will be used to improve Basin water quality. The Project is contemplated in GMP Section 4.6, Projects and Management Actions (PMA) No. 5 - Water Quality Optimization. The goal of this PMA is to ensure that water quality meet potable drinking water standards specified in Title 22 of the CCR. This PMA called for, "(1) investigation to identify the sources, nature, and extent of existing and potential future water quality impairments; (2) as needed, development of work plans to implement mitigation strategies; and (3) implementation of water quality mitigation projects". The WWTF monitoring wells project specifically addresses above items 1 and 2 and provides necessary data and analysis to evaluate whether mitigation is required for further treatment of wastewater prior to discharge.

**What are the specific goals and needs for the Project, and how will the project achieve the goals and meet the needs?**

The specific goals for the Project are to evaluate fate and transport of nitrate and other COCs from effluent discharged from the WWTF. The Project will achieve these goals through installation of three new clusters of depth-discrete monitoring wells in the vicinity of the percolation/evaporation ponds, data collection and reporting. The wells will be monitored for water quality and groundwater levels to track trends and evaluate fate of nitrate and COC in the aquifer. Furthermore, the data will be used to assist with evaluation of treatment processes at the WWTF and potentially result in upgrades to the facility to lower nitrate concentrations in discharged effluent.

**What are the quantifiable benefits of the Project (e.g., protect or enhance water quality, water conservation, enhanced understanding of the groundwater basin, etc.)? How will those benefits be quantified and evaluated?**

The quantifiable benefits include protection and potentially enhancement of water quality through future upgrades to the WWTF treatment processes, if necessary. Benefits will be quantified through

collection of water quality and groundwater level data. Water quality testing will be done by a certified lab and results will be shared with the public. A fate and transport analysis will be completed to determine if upgrades are required to the WWTF treatment processes. If upgrades are required, benefits will be quantified by measuring the reduction in nitrate from plant effluent discharge.

**Does the Project or Component fully describe their plan for outreaching and engaging interested parties (e.g., residents, local leaders, non-profit representing Underrepresented Communities, etc.) located within Underrepresented Communities? Does the outreach and engagement include interested parties during all phases of the Project or Component (e.g., planning, design, and implementation)? Can interested parties provide input and be involved in the decision-making processes?**

All steps of the process will be shared in BWD board meetings where public input is directly solicited. Before the well drilling begins BWD will reach out directly to nearby residents who could be disturbed by drilling noise. BWD will create and share with local residents a detailed daily schedule of the work, when trucks will be coming and going and when the noisy drilling will take place. The schedule will be in English and Spanish. If noise looks to be or becomes an issue BWD can build a temporary sound barrier wall.

**Please describe the communities served by the Project. Will the Project benefit an Underrepresented Community, a Disadvantaged Community (DAC), and/or a Severely Disadvantaged Community (SDAC)? If so, please provide a map.**

The Basin has been identified as a Disadvantaged Community (DAC) and Severely Disadvantaged Community (SDAC) (Figure 2). As documented by the BWD affordability of water is already a challenge for many of the District's ratepayers because Borrego Springs median household income is approximately \$36,583 (Rafetelis 2018). Ratepayers at the median income pay 2% of their household income for essential water use, 2.5% for efficient water use, and 3% for target average water use in fiscal year 2018 (Rafetelis 2018). Those at the 20th percentile and those at the poverty level spend between 3.2% and 3.8% of their income solely for essential water needs. An affordability standard of 2.5% and 2% of national median household income for water and sewer bills respectively was selected based on U.S. Environmental Protection Agency guidelines for water quality standards and Combined Sewer Overflow (CSO) compliance. This analysis supports the conclusion that the SDAC community should be insulated from cost increases due to SGMA compliance.

**Will the Project or Component positively impact issues associated with small water systems or private shallow domestic wells (e.g., groundwater contamination vulnerability, drawdown, etc.)? If so, please provide justification such as water system maps or domestic well census results.**

Data collected for the Project will provide better understanding of current aquifer conditions and address potential water quality impairment to nearby shallow domestic wells and the Borrego Air Ranch mutual water company that serves a small private community.

Installation of monitoring wells will improve understanding of groundwater levels and water quality of the shallow aquifer in the vicinity of the WWTF. There are shallow domestic wells located approximately 1-mile northwest of the WWTF and the Borrego Air Ranch is approximately 2 miles from it. The new monitoring wells will provide valuable information pertaining to the fate and transport of nitrates and COCs in the aquifer.

**Does the Project address the needs of the State Water Board’s SAFER Program, designed to ensure Californians who lack safe, adequate, and affordable drinking water receive it as quickly as possible, and that the water systems serving them establish sustainable solutions?**

The Project for Rams Hill Waste Water Treatment Facility Monitoring Wells does not address the needs of the State Water Board’s SAFER Program.

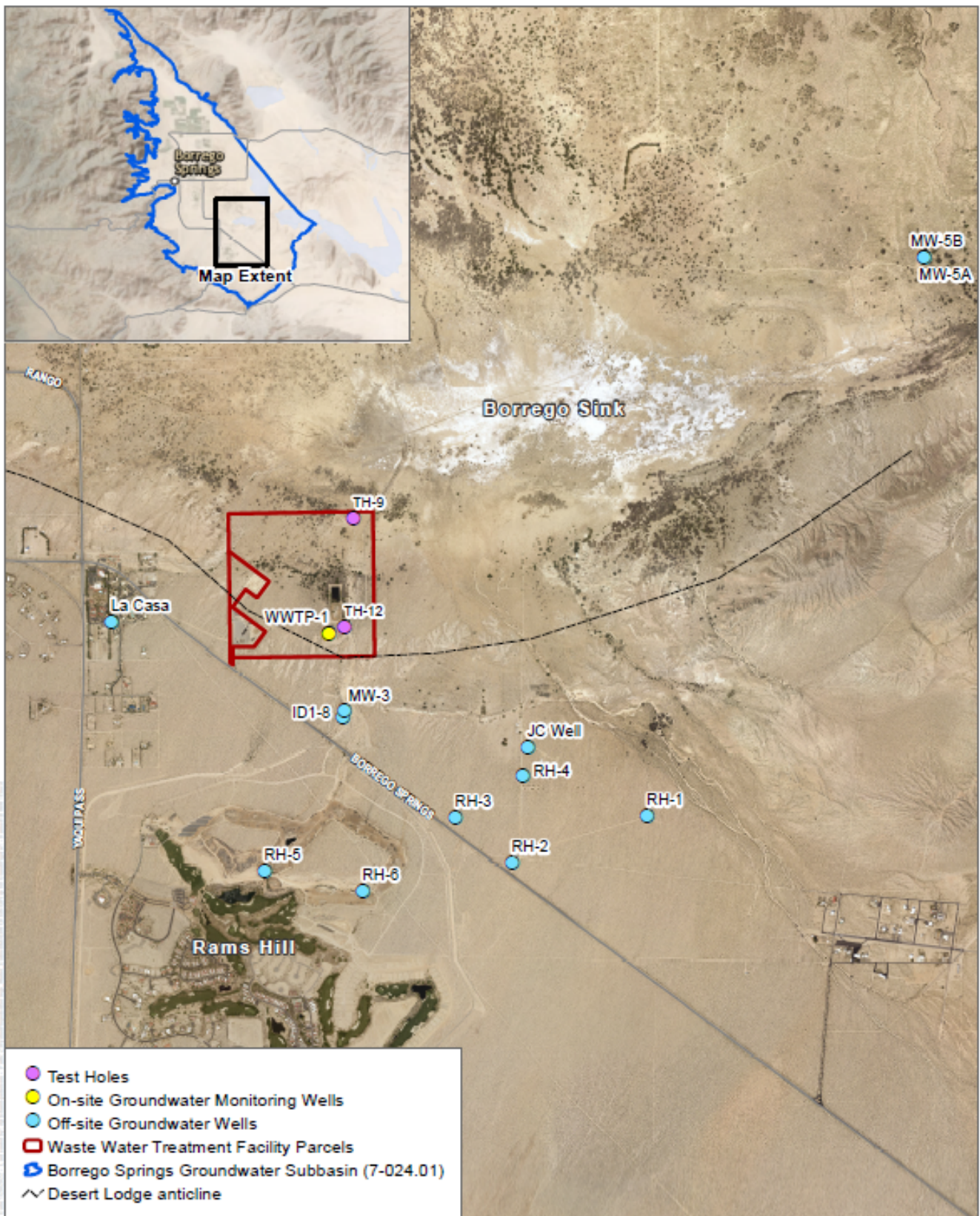
**How does the Project address the Human Right to Water (AB 685 Section 106.3) which states that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes?**

The Project will benefit all BWD customers including the SDAC community because of it’s potential impact to the underlying aquifer.

**Please describe how the project contributes to addressing the risks in the region to water supply and water infrastructure arising from climate change. If possible, please provide the amount of greenhouse gas emissions reduced and carbon sequestered resulting from the project.**

The Basin is 100% groundwater dependent with no currently economically viable alternative sources of supply. Climate change is expected to bring greater variability of rainfall to the Basin and contributing watershed, and increased temperatures that will result in increased reference evapotranspiration resulting in increased water demand for irrigation. The Project addresses potential water quality impairment by evaluating COC from a point source of discharge to the Basin. The Project provides for protection and potentially enhancement of water quality through future upgrades to the WWTF treatment processes, if necessary. By maintaining the aquifer as potable source of water supply, potentially costly and energy intensive water treatment can be avoided. At this point, the Basin provides potable water that meets CCR Title 22 requirements without the need for treatment and estimation of any potential future reduction in greenhouse gas emissions from not having to potentially need to treat water would be speculative. It is not anticipated that any carbon will be sequestered as part of the Project.

Figure 1. Borrego Springs Subbasin and Rams Hill WWTF

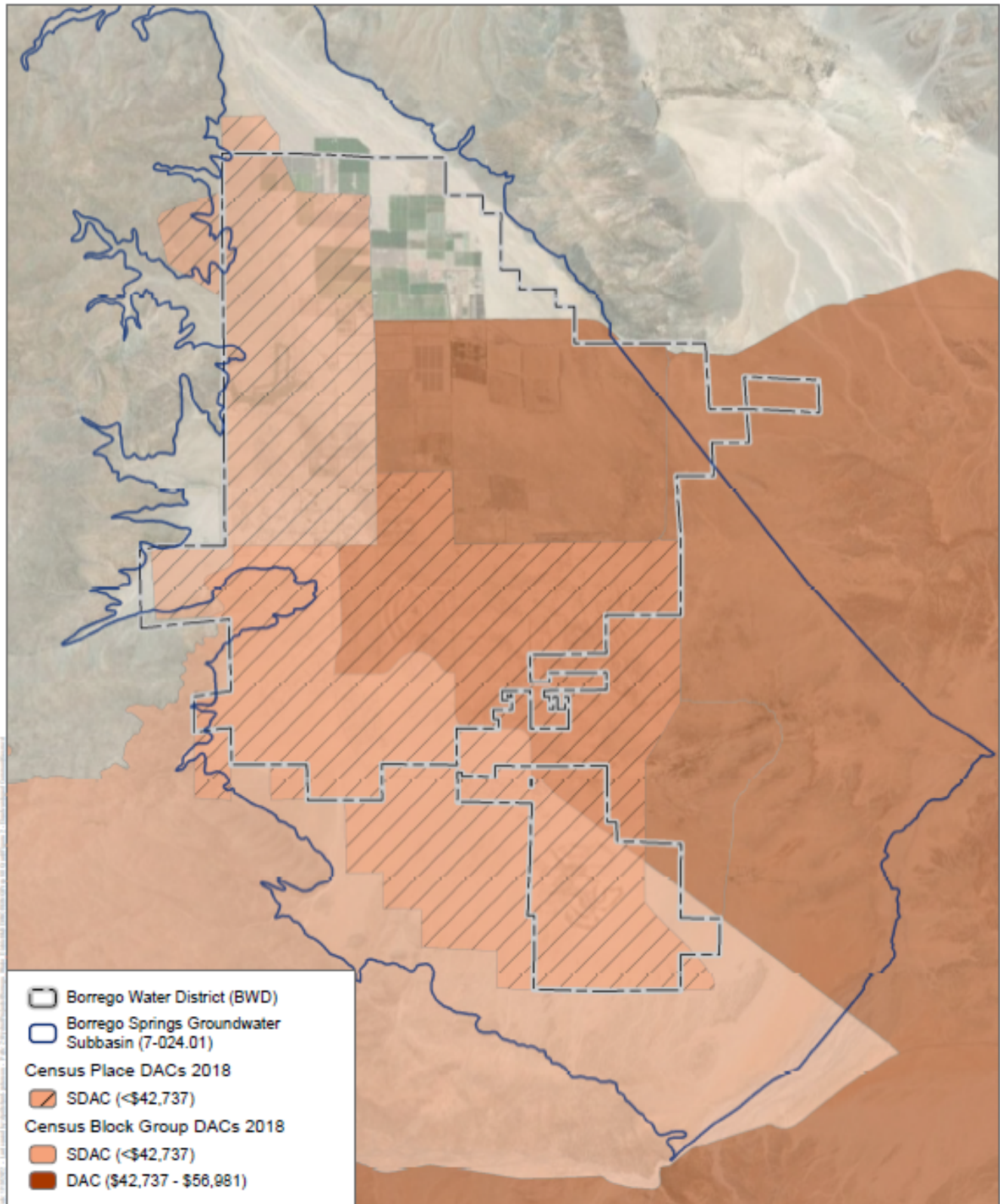


SOURCE: SanGIS; BWD

FIGURE 1

Rams Hill WWTF

Figure 2. SDAC



SOURCE: ESR; BWD; DWR

FIGURE 2

Disadvantaged / Severely Disadvantaged Communities (DACs / SDACs)

# Work Plan

## **Budget Category (a): Project Administration**

### **Task 1 - Project Management**

This Task includes managing the grant agreement, including compliance with grant requirements, and preparation and submission of all supporting grant documents. In addition, providing updated schedule and progress reports as well as all required meetings or teleconference calls to ensure Project success and completion. This task also includes administrative responsibilities associated with the project, such as coordinating with consultants/contractors, and preparation/submittal of invoices, including relevant supporting documentation for submittal to DWR.

**Deliverables:** Project schedule and progress reports. Invoices and necessary grant documentation.

## **Budget Category (b): Planning/Design/Environmental**

### **Task 2. - Planning**

Activities necessary to secure a contractor and award the contract including: developing bid documents for drilling and installation of three clustered monitoring wells, preparing advertisement and contract documents for construction contract bidding, conducting a pre-bid meeting, bid opening and evaluation, selection of the contractor, award of contract, and issuance of notice to proceed. BWD has an in-house engineer and operations staff that will oversee procurement and construction management of the Project. The BWD has already prepared the following documents for this project: Groundwater Monitoring Network Technical Report (Dudek 2019a), Total Dissolved Solids Source Control Program Technical Report (Dudek 2019b), Groundwater Monitoring Network Work Plan (Dudek 2020) and Final Contract Documents and Specifications (BWD 2021). The Project is in the process of completing CEQA and near shovel ready. Through December 2021, approximately \$75,000 has been spent on this Project.

**Deliverables:** All above listed deliverables are 100% complete

### **Task 3. - CEQA**

Because this project does not have a significant effect on the environment, BWD will file for a California Environmental Quality Act (CEQA) Categorical Exemption citing CEQA Section 15303 New Construction or Conversion of Small Structures. As part of this Notice of Exemption, staff will perform the required field surveys to support the exemption claim (i.e. cultural, biology, and focused surveys). CEQA costs were estimated based on recent environmental compliance work completed for Well ID5-15 in the amount of \$19,000.

**Deliverables:** Field Surveys and CEQA Notice of Exemption

**Budget Category (c): Construction/Implementation**

**Task 4. – Construction Management**

Field Oversight for Monitoring Well Drilling, Construction, Development and Water Quality Sampling will include, but not be limited to lithological sample collection, documentation and logging, downhole geophysical logs (as-applicable), drilling mud characteristics (as applicable), field observations, and progress reporting. Field staff will make sure the monitoring wells are drilled, constructed, and developed according to the project technical specification. Casing will be inspected when delivered to verify the material is the same as determined by the final well design, including casing diameter, wall thickness, screen schedule, blank lengths, and slot size. As casing is installed, field staff will verify that screen/blank sections are assembled according to final design. During filter pack placement, field staff will verify that volume placed in the annular space is appropriate. During placement of annular seals, field staff will confirm that volume of material placed is approximate to the theoretical annular volume. Field staff will be on-site to oversee well development. Development may consist of a combination of well surging using a surge block, then bailing and/or pumping with a submersible pump to remove fines, silts, and clays. The volume of water removed from each well during development will be recorded. Water quality parameters such as pH, specific conductivity, temperature, and turbidity will be monitored during development.

**Deliverables:** Daily field inspection logs/notes/photographs/labor detail

**Task 5. – Monitoring Well Drilling and Installation**

The work shall include the drilling, construction, and development of six groundwater monitoring wells. The wells will be drilled and completed in the unconsolidated deposits of the Borrego Springs Groundwater Subbasin to a maximum depth of approximately 100 feet using the sonic drilling method in accordance with the Final Contract Documents and Specifications (BWD 2021). An engineer’s estimate of probable cost to complete the drilling, construction, and development of six monitoring wells with 10% contingency is \$107,000.

**Deliverables:** Driller’s Well Completion Reports

**Budget Category (d): Monitoring/Assessment**

**Task 6. – Water Quality Sampling**

After well development, field staff will collect groundwater samples from each well using a submersible pump to be analyzed for specific constituents detailed in Table 1 of the approved Work Plan. This task includes scope and fee to collect a sample from each new monitoring well and the existing WWTP-1 monitoring well.

**Deliverables:** One-round water quality sample results for 7 wells.

**Task 7. – Well Completion Report**

The new monitoring wells will be surveyed using high precision Global Position System equipment as described in the approved Work Plan. Upon completion of well installation activities, BWD will



coordinate with the drilling contractor to prepare and submit the well completion report to the County of San Diego and DWR. In addition to the driller's well completion report, BWD's consultant will prepare a more detailed, comprehensive well completion report which will document all drilling operations, include a description of the lithology encountered at each borehole, the type and quantity (volumes) of well construction materials used. Well development forms which document well development using standard metrics (i.e. turbidity, pH, electrical conductivity, temperature, total depth, and depth to water measurements), which will also be provided in the well completion report.

**Deliverables:** Well completion report.

### **Task 8. – Nitrogen Control Strategy Technical Report: Fate and Transport Investigation and Effluent Limit Feasibility Study**

**Data collection:** Available influent and effluent water quality data from the WWTP, including flow, BOD, TSS, TKN (influent) and Total Nitrogen (TN) and Nitrate-N (effluent). This data will be used to determine current plant performance and nitrogen removal.

**Process Analysis:** Available data will be analyzed, and treatment process performance documented for nitrogen removal and compared to expected performance based on process capacity and typical industry ranges. If there is insufficient data, an analysis to document the nitrogen removal performance will be completed.

**Identify Process Improvement Alternatives and 10 mg/L TN feasibility:** Recommend alternatives to improve nitrogen removal performance at the WWTP, which may include enhanced process monitoring and control, modifications to aeration system, operational adjustments to promote biological nutrient removal, and/or construction of additional process infrastructure will be identified. If sufficient data exists, the feasibility of obtaining a 10 mg/L total nitrogen effluent limitation with existing infrastructure will be determined. Alternatively, the steps to make the determination will be documented in the work plan. For each improvement alternative, a budgetary cost estimate (based on unit costs, cost of major process equipment, and recent similar project cost data) to determine a cost of improvement will be prepared. The nitrogen removal associated with each alternative will be estimated in order to calculate an approximate dollars per ton of nitrogen removed and approximate cost per EDU to BWD ratepayers.

**Calculate Effluent Nitrogen Mass Load to Groundwater Basin and Basin assimilative capacity:** The existing nitrogen mass load to the groundwater basin and the mass load assuming a 10 mg/L effluent TN limit to determine the current load to the basin and anticipated future load will be calculated. In parallel, the nitrogen assimilative capacity of the basin will be calculated and compared to both the current load and anticipated load with a 10 mg/L TN effluent limitation. This analysis will determine both if the wastewater is impairing groundwater quality and whether or not the discharge is causing an exceedance of the nitrogen receiving water limitation. If insufficient data exists, methods and means to make this determination will be developed.

**Prepare Nitrogen Control Strategy Technical Report:** The report will (1) determine if wastewater discharged to the evaporation/percolation ponds is causing nitrogen impairment to groundwater (2) determine the feasibility of achieving a 10 mg/L total nitrogen effluent limit and, (3) ensure that any proposed effluent limit for nitrogen does not cause exceedance of the nitrogen receiving water

limitation. The report will document the analysis and outline the work plan and schedule to complete tasks with insufficient data and/or additional work to be required.

**Deliverables:** Nitrogen Control Strategy Work Plan

**Budget Category (e): Interested Parties Outreach/Education**

**Task 9. - Outreach and Education**

BWD continually emphasizes education of its ratepayers through various formats including Town Hall meetings, presentations, and informational flyers. BWD will highlight the project through an informational flyer that will be posted to the BWD's website.

**Deliverables:** WWTF Informational flyer, updates on the project execution in BWD board meetings, ongoing publication of the water quality reports.

# Budget

		(a)	(b)	(c)	(d)
Category		Requested Grant Amount	Local Cost Share: Non-State Fund Source*	Total Cost	% Local Cost Share (Col(b))/(Col(c))
<b>(a)</b>	<b>Project Administration</b>	<b>\$10,000</b>	<b>\$0</b>	<b>\$10,000</b>	<b>0%</b>
	Task 1. Project Management	\$10,000	\$0	\$10,000	
<b>(b)</b>	<b>Planning/Design/Environmental</b>	<b>\$19,000</b>	<b>\$75,000</b>	<b>\$94,000</b>	<b>80%</b>
	Task 2. Planning	\$0	\$75,000	\$75,000	
	Task 3. CEQA	\$19,000	\$0	\$19,000	
<b>(c)</b>	<b>Construction/Implementation</b>	<b>\$141,000</b>	<b>\$0</b>	<b>\$141,000</b>	<b>0%</b>
	Task 4. Construciton Management	\$34,000	\$0	\$34,000	
	Task 5. Monitoring Well Drilling and Implementation	\$107,000	\$0	\$107,000	
<b>(d)</b>	<b>Monitoring/Assessment</b>	<b>\$33,500</b>	<b>\$0</b>	<b>\$33,500</b>	<b>0%</b>
	Task 6. Water Quality Sampling	\$5,000	\$0	\$5,000	
	Task 7. Well Completion Report	\$8,500	\$0	\$8,500	
	Task 8. Nitrogen Control Strategy Technical Report	\$20,000	\$0	\$20,000	
<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>	<b>\$3,000</b>	<b>\$0</b>	<b>\$3,000</b>	<b>0%</b>
	Task 9. Outreach and Education	\$3,000	\$0	\$3,000	
<b>(f)</b>	<b>Grand Total (Sum rows (a) through (d) for each column)</b>	<b>\$206,500</b>	<b>\$75,000</b>	<b>\$281,500</b>	<b>27%</b>

\* List sources of Local Cost Share funding: The BWD Board voted unanimously on January 18, 2022 to provide a 5% cost share for all funding obtained for the WWTF Project. The source of the local cost share is revenue generated from BWD water rates. BWD has already spent \$75,000 on the Project to date and we apply these funds as a local cost share, if eligible.

<b>Categories</b>		<b>Start Date</b> (Earliest Start Date)	<b>End Date</b> (Latest End Date)
<b>(a)</b>	<b>Project Administration</b>	<b>01/01/2022</b>	<b>06/01/2023</b>
	Task 1. Project Management	01/01/2022	06/01/2023
<b>(b)</b>	<b>Planning/Design/Environmental</b>	<b>01/01/2021</b>	<b>04/01/2022</b>
	Task 2. Planning	01/01/2021	12/31/2021
	Task 3. CEQA	01/01/2022	04/01/2022
<b>(c)</b>	<b>Construction/Implementation</b>	<b>04/01/2022</b>	<b>01/01/2023</b>
	Task 4. Construciton Management	04/01/2022	01/01/2023
	Task 5. Monitoring Well Drilling and Implementation	04/01/2022	01/01/2023
<b>(d)</b>	<b>Monitoring/Assessment</b>	<b>08/01/2022</b>	<b>06/01/2023</b>
	Task 6. Water Quality Sampling	08/01/2022	10/01/2022
	Task 7. Well Completion Report	09/01/2022	11/01/2022
	Task 8. Nitrogen Control Strategy Technical Report	01/01/2023	06/01/2023
<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>	<b>01/01/2022</b>	<b>06/01/2023</b>
	Task 9. Outreach and Education	01/01/2022	06/01/2023