

# Project Information Submittal Form

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**Project Submitter/Owner:** Borrego Springs Watermaster

**Project Name:** Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin

## Contact Information

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## Project Summary

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

A Stipulated Judgment (Judgment) adjudicating all groundwater rights in the Borrego Springs Subbasin (Basin) of the Borrego Valley Groundwater Basin was entered by the Orange County Superior Court of the State of California on April 8, 2021. The Judgment provides a physical solution for the perpetual management of the Basin to achieve sustainable groundwater management consistent with the substantive objectives of the SGMA and with reasonable and beneficial use pursuant to the California Constitution. The Judgment considered together with the Groundwater Management Plan (GMP; included as Exhibit 1 to the Judgment) constitutes the Physical Solution for the Basin and serves as the technical approach to achieve sustainability. The Physical Solution is intended to provide flexibility and adaptability to allow the Court to use existing and future technological, social, institutional, and economic options to maximize reasonable and beneficial water use in the Basin. The Physical Solution (e.g., the Judgment and GMP) was submitted to the California Department of Water Resources (DWR) as an Alternative to a GSP in June 2021.

The Basin has been, and presently is, in a condition of long-term overdraft and there is no viable means to remedy the overdraft through artificial recharge or other supply augmentation strategies under current Basin conditions and pumping quantities. Therefore, it is necessary to implement the Physical Solution, which provides for an immediate and aggressive rampdown of annual pumping over the next twenty years. The Court deemed that the evidence to support this conclusion is that the Physical Solution appropriately balances competing economic, social, and environmental considerations, and that it will result in the optimal management of the Basin. The Physical Solution will accelerate water-saving actions and provide flexibility and adaptability to maximize the reasonable and beneficial use of the Basin's groundwater and protect against undue economic harm to the Borrego Springs community.

To maintain a viable water supply for current and future beneficial uses and users of groundwater in the Basin, the sustainability goal of the Physical Solution is to ensure that by 2040, and thereafter, the Basin is operated within its Sustainable Yield and does not exhibit Undesirable Results. The Physical

Solution establishes that the initial Sustainable Yield of the Basin is 5,700 acre-feet per year (afy). The Rampdown of pumping is intended to reduce annual pumping from the Baseline Pumping Allocation (BPA) of 24,293 acre-feet per year (afy) to the Sustainable Yield by water year (WY) 2039/40. In each of the first five years of implementation (WY 2020/21 through WY 2024/25), the annual pumping allocation will be reduced by five percent of each pumpers' BPA. The amount and pace of the Rampdown after WY 2024/25 will be through a systematic process that adjusts the Rampdown rate after periodic redeterminations of the Sustainable Yield that consider new data and information obtained through implementation of the GMP. The first refined and specific estimate of the Sustainable Yield must be determined by the Watermaster by January 1, 2025 through a formal Technical Advisory Committee process based on the best available science including the use of the Borrego Valley Hydrologic Model (BVHM) and consideration of all sources of Basin replenishment and outflow. The five-year updates of the GMP are timed to follow each Sustainable Yield redetermination to ensure the plan can be adapted to the latest understanding of Basin conditions.

To support the sustainability goal of the Physical Solution, the GMP established minimum thresholds and measurable objectives for the following sustainability indicators determined to be a current and/or potential future Undesirable Result: chronic lowering of water levels, reductions of groundwater storage, and water-quality degradation. The GMP defines a comprehensive initial groundwater and surface-water monitoring program to collect the data and information needed to track Basin conditions relative to the minimum thresholds and measurable objectives. Additionally, the GMP also identifies data gaps that should be filled. The data gaps include:

- **Metered groundwater pumping.** The initial Sustainable Yield is based largely on estimates of historical pumping and could be improved through the metering of pumping at wells. The Physical Solution requires metering of all non-*de minimis* wells in the Basin and provides for the collection of meter reads of pumping volumes at appropriate frequency to support the update, calibration, and use of the BVHM. It also requires pumpers to perform annual accuracy testing to ensure the accurate calculation of groundwater pumping (Judgment Sections VI.A, IV.E.6).
- **Groundwater elevation.** The current monitoring network should be evaluated annually to ensure representative spatial distribution of wells and address loss of wells over time due to various factors. Construction of new monitoring wells should be considered in areas where data gaps can't be filled with existing wells. The GMP identified that, "multi-completion wells or well clusters screened at discrete intervals in the upper, middle, and lower aquifers would be required to determine the potentiometric surface by aquifer unit".
- **Groundwater quality.** There are limited contemporary data available for private wells located in the North and Central Management Areas of the Basin to delineate nitrate and TDS concentrations laterally and vertically in the upper aquifer. the GMP indicated that, "Multi-completion wells or depth discrete water quality samples would be required to better characterize water quality by aquifer zone and depth in the [Basin]." There are also potential threats to water quality posed by improperly abandoned wells. The Physical Solution addresses these issues as follows:
  - Water quality monitoring is essential to avoiding Undesirable Results and achieving sustainable groundwater management in the Basin. The Physical Solution provides for the development of a Water-Quality Monitoring Plan that can be implemented to characterize and track water-quality trends in the Basin and develop remedies for

significant and unreasonable changes in water quality under the water quality optimization Project and Management Action (Judgement Section VI.B). Construction of new monitoring wells should be considered in areas where data gaps can't be filled with existing wells.

- The Watermaster will cooperate with the County of San Diego in the enforcement of the well abandonment ordinance as improperly abandoned wells have the potential to provide a mitigation pathway of contaminants into the Basin (Judgement Section X.B).
- **Surface water flow.** The primary sources of natural recharge to the basin are mountain-block recharge and infiltration from ephemeral streams entering the Borrego Valley from the adjacent mountain watersheds. These sources of recharge were estimated using data from the regional Basin Characterization Model (BCM). The installation of stream gaging stations in Coyote Creek and other major drainages to the Basin could improve the BCM estimates of runoff to the basin.
- **Aquifer properties.** The results of BVHM calibration and validation indicate a slight bias of the model to underestimate hydraulic heads in certain areas. Aquifer stress testing at wells could provide site-specific and depth-specific estimates of hydraulic conductivity and storage parameters that could then be used to constrain future model calibration efforts and improve model accuracy.

In recognizing the critical role of monitoring and analyzing Basin conditions to ensure achievement of the sustainability goal, the Judgment provides for flexible, adaptive management that mandates the study, refinement, and improvement of the Sustainable Yield estimate based on the best available science, records, and data.

To effectively implement the Physical Solution, the Watermaster must meet regularly to make decisions and take actions to achieve sustainability. The update of the Sustainable Yield and GMP, including all the work performed to support these updates, is enabled by participatory and competent Basin governance through the appointment of a Watermaster Board representing diverse interests in the Basin, including municipal, agricultural, recreation, community, and County representatives. The Judgment prescribes an equitable and transparent decision-making process and provides for perpetual ongoing Court oversight to ensure compliance with the Judgment, to amend the Judgment if ever necessary, and to efficiently resolve conflicts. It also requires the formation of a Technical Advisory Committee (TAC) and an Environmental Working Group (EWG) to provide guidance to the Watermaster Board on subject matters within their purview.

The TAC's responsibilities include making recommendations based on best science and data collected regarding the Water Budget and the avoidance of undesirable results including, without limitation, information generated from BVHM model runs. TAC meetings are open to the public and are an important venue for public comment. Membership of the Technical Advisory Committee is open to experts hired by any Party holding BPA or the County and thus constitutes a diverse decision-making body. The TAC is responsible to endeavor to decide all matters by consensus.

All meetings of the Watermaster, including meetings of the Board, TAC, and EWG, are public outreach opportunities that provide for communication of Watermaster planned actions and a venue to receive public input prior to making decisions. Outreach to the community through these regular meetings is critical to maintain support for the mission of achieving sustainability. The Watermaster maintains a website and an interested stakeholder distribution list to advertise meetings, disseminate

important information, and call for input at Watermaster hearings that are required by the Judgment to be held prior to Board action on key decisions.

As evident by this summary, the implementation of a comprehensive program to monitor, analyze, and report on key hydrogeologic data is paramount to successfully achieving the sustainability goal of the Basin in a manner that complies with the Judgment and seeks input from the local community on a regular basis.

The proposed project for *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin* is a comprehensive monitoring, analysis, data management and reporting program that will ensure the effective implementation of the pumping rampdown, including filling data gaps identified in the Judgment and GMP, and performing the required redetermination of the Sustainable Yield and GMP update due in 2025.

This project is made up of the following components:

- Task 1 - Groundwater Pumping Monitoring
- Task 2 - Groundwater Level Monitoring
- Task 3 - Groundwater Quality Monitoring
- Task 4 - Surface Water Flow Monitoring
- Task 5 - Construction of New Monitoring Facilities
- Task 6 - Identify and address improperly Abandoned Wells
- Task 7 - Maintain and enhance the Basin Data Management System
- Task 8 - Annual Reporting to DWR and the Court
- Task 9 - Redetermination of the Sustainable Yield by 2025
- Task 10 - Prepare the 2025 GMP Update.
- Task 11 - Stakeholder Outreach
- Task 12 - Project Management and Grant Reporting

The description of each component, including its major sub-tasks are described below.

**Task 1. Groundwater Pumping Monitoring.** The objective of this task to collect, compile, and manage all Basin pumping data to ensure successful compliance with the pumping rampdown. The subtasks include:

- Task 1a - Monthly meter reading and pumping calculations. This involves Watermaster contractors visiting wells with manual read meters to record meter readings, collecting self-reports of meter reads between Watermaster reading events, and downloading meter reads for wells with telemetry systems. Each month, data will be processed, checked for QA/QC, and loaded to Watermaster's Data Management System (DMS).
- Task 1b - Annual meter accuracy testing. This involves performing annual meter accuracy testing at all non-*de minimis* wells in the Basin. Upon completion of testing, reports will be reviewed, checked for QA/QC, and recorded. Letters requesting corrective action will be sent to any pumper with test results indicating that meters are not accurately reporting production.
- Task 1c - Outreach to existing and new *de minimis* pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable. There are

about 50 de minimis wells in the Basin. The Judgment requires Watermaster approval of construction of all new de minimis wells. Installation of meters is a condition of approval and Watermaster will perform semi-annual meter reads at the de minimis wells. Watermaster will also perform outreach to existing de minimis well owners to request voluntary cooperation in Watermaster's pumping and other groundwater monitoring programs.

**Task 2. Groundwater Level Monitoring.** The objective of this task is to implement a comprehensive groundwater-level monitoring program to track changes in Basin conditions (e.g., groundwater levels, storage, and flow directions) and the effectiveness of the Physical Solution. Subtasks include:

- Task 2a - Implement the existing and future expanded groundwater-level monitoring program. This involves semi-annual monitoring events to collect manual water level measurements and download pressure transducers with continuously-recording data-loggers. Following each field event, data will be processed, checked for QA/QC, and loaded to Watermaster's Data Management System (DMS). This task also provides for the purchase and installation of up to fifteen new pressure transducers.
- Task 2b - Expand Monitoring Network through Outreach. This involves performing outreach efforts to the DWR, the Parties, and others to obtain cooperation from well owners in expanding the groundwater-level monitoring network, visiting wells in the field to assess suitability for monitoring, and executing access agreements.
- Task 2c - Prepare monitoring well construction work plan. The Borrego Water District (BWD) and Watermaster are currently working cooperatively with the DWR Technical Support Services (TSS) staff to locate, design, drill, and construct one new multi-completion monitoring well in the North Management Area of the Basin. BWD in cooperation with the Watermaster presented proposed new monitoring well locations to the Watermaster's TAC and have elected to proceed with the TSS grant for one new well. During the well locating task, it was determined that additional monitoring wells will be necessary to replace aging wells and fill data gaps in the monitoring network. The workplan will include a well-siting study and technical specifications for construction of one new multi-depth monitoring well in an area with insufficient monitoring. The well-siting study in this Task 2c could also be designed to address gaps in the groundwater-quality monitoring network identified in Task 3b.
- Task 2d. Aquifer testing. This task would involve development of an aquifer testing work plan in conjunction with the TAC, the filed work to perform the aquifer test, data analysis, and preparation of a draft and final report of results and recommendations.

**Task 3. Groundwater Quality Monitoring.** The objective of this task to implement a comprehensive groundwater-quality monitoring program to track changes in Basin conditions and evaluate the need for water quality optimization programs to achieve sustainability. Subtasks include:

- Task 3a - Implement the existing and future expanded groundwater-quality monitoring program. This involves semi-annual monitoring events to collect water quality grab samples at wells. The water samples will be analyzed for constituents identified in the GMP, including arsenic, fluoride, nitrate, sulfate, TDS, and all other major anions and cations. Following each field event, data will be processed, checked for QA/QC, and loaded to Watermaster's DMS.
- Task 3b - Prepare Water-Quality Monitoring Plan (WQMP). The purpose of the plan is to enhance the monitoring network and program. The steps to develop the WQMP include: (i) define the questions that the monitoring plan should answer to comply with the Judgment; (ii) identify the gaps in the interim groundwater-quality monitoring program that should be filled

to comply with the Judgment; and (iii) describe recommended steps and costs to fill the data gaps.

**Task 4. Surface Water Flow Monitoring.** The objective of this task to implement a surface water monitoring program to collect data that can be used in the BVHM to assess Basin recharge and the Sustainable Yield. In the first year of the grant period, this task will involve the current flow monitoring on Coyote Creek described in the GMP and will be expanded after completion of the surface-water discharge station described in Task 5b. The expanded monitoring is described in Exhibit A (Task 5 and Optional Task).

**Task 5. Construction of New Monitoring Facilities.** The objective of this task to design and construct monitoring facilities to fill data gaps identified in the GMP and/or by the TAC and EWG. This work includes acquiring permits, performing CEQA, preparing technical specifications, preparing bid documents, performing construction and oversight, and preparation of facility completion reports. Subtasks include:

- Task 5a. Construct multi-completion monitoring well. This project component provides for design, drilling, and construction of a multi-completion monitoring well pursuant to the workplan completed in Task 2c.
- Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek. Approximately 65% of the surface water inflow to the Borrego Valley comes from Coyote Creek, and the GMP identified monitoring of these flows as a data gap. This project involves installation of a camera (ECAM or equivalent) and staff gauge, surveys, establishing rating curves, and repairs/maintenance of the facility in the event of disturbances during or after high-discharge events. The detailed project approach is described in Exhibit A (Tasks 1 through 4).
- Task 5c. Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink. This monitoring well will only be constructed pursuant to a recommendation from the EWG and direction of the Watermaster Board and is expected to support an investigation of rooting-depth and source-water of the Mesquite Bosque.
- Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink. This monitoring site will only be constructed pursuant to a recommendation from the EWG and is expected to support an investigation of rooting-depth and source-water of the Mesquite Bosque.

**Task 6. Identify and Address Improperly Abandoned Wells.** The GMP identified abandoned wells as a potential Project and Management Action (PMA). The objective of this task to identify improperly abandoned wells, and if accessible through an easement or other access agreement, the wells will either be properly abandoned or converted to a monitoring well. Subtasks include:

- Task 6a - Outreach. Develop outreach tools to identify improperly abandoned wells and perform outreach to determine access.
- Task 6b - Well Abandonment. Properly abandon up to 3 inactive production wells. An Engineers Estimate was obtained to properly abandon a 16-inch diameter, 500 feet deep well in 2018 dollars in accordance with DWR Bulletin 74-81 and 74-90 (i.e. California Well Standards). It is \$33,500 assuming the well needs to be pressure grouted with cement and



prevailing wage applies. For each additional foot of well depth an additional \$41 should be added to the cost. Costs for narrower diameter wells would be less expensive. The Engineers Estimate to pull a turbine pump installed to a depth up to 500 feet is \$6,800 assuming prevailing wage applies. Thus, the Engineers Estimate to properly destroy wells is approximately \$40,300 per well assuming prevailing wage applies.

- Task 6c - Conversion of Abandoned Wells to Monitoring Wells. Conversion of up to 2 inactive production wells. The task would provide for the removal of the existing pumping equipment, remediation of any down-well turbine fluid, collection of one water quality sample for general minerals and metals, and installation of a pressure transducer to monitor groundwater levels at a sub-daily frequency.

**Task 7. Maintain and Enhance the Data Management System.** The objective of this task to maintain and improve the Watermaster's Data Management System for efficient reporting in compliance with the Judgment and Grant requirements. As part of this task, Watermaster will develop specific reporting tools to efficiently report data to CASGEM, CEDEN, GAMA, or other required platforms. Additional tools may be developed to improve the efficiency of data analysis and report of production, water level, and water quality data.

**Task 8. Annual Reporting to DWR and the Court.** The objective of this task is to prepare the combined annual report of Basin conditions and the Physical Solution implementation progress. The annual report will be prepared pursuant to the requirements of CCR Section 356.2, Section IV.E(5)(b) of the Judgment, and Section 4.2.8 of the Watermaster Rules and Regulations. Each year, a draft report will be reviewed at a public hearing to receive comments and the final report will be completed and submitted to the Court and the DWR no later than April 1<sup>st</sup> following the end of the calendar year. A detailed record of public comments will be included in the final report. Over the grant period, Annual Reports will be prepared for WY 2021 (due April 1, 2022), WY 2022 (due April 1, 2023), WY 2023 (due April 1, 2024), and WY 2024 (due April 1, 2025).

**Task 9 - Redetermination of the Sustainable Yield by 2025.** The Borrego Valley Hydrologic Model (BVHM) and its supporting tools, the Basin Characterization Model (BCM) and the Farm Process (FMP), were originally developed by the USGS<sup>1</sup> and used to estimate of the Sustainable Yield of the Borrego Springs Subbasin (Subbasin) and to evaluate future scenarios of "Rampdown" in groundwater pumping that would eliminate conditions of overdraft. The BVHM was updated by Dudek<sup>2</sup> to characterize the water budget and determine the Sustainable Yield of 5,700 acre-feet per year (afy) which was incorporated into the Judgment. The USGS and Dudek identified several areas of model uncertainty, including private pumping estimates, aquifer properties, and streambed recharge.

Section III.F. of the Judgment states:

- During the first four Water Years (2020-2021 to 2023-2024), the Watermaster will collect additional data and refine the BVHM, using model runs to update the determination of Sustainable Yield in collaboration with the Technical Advisory Committee (TAC).

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<sup>1</sup> USGS. 2015. [Hydrogeology, Hydrologic Effects of Development, and Simulation of Groundwater Flow in the Borrego Valley, San Diego County, California.](#)

<sup>2</sup> Dudek. 2019. [Update to USGS Borrego Valley Hydrologic Model for the Borrego Valley GSA \(draft final\).](#)

- The choice to perform specific technical tasks will be informed by considering the value and importance of the work to attain a better understanding of the Basin and the goal of advancing Sustainable Groundwater Management in comparison to the cost of the work.

In WY 2021, the TAC and Watermaster Board agreed upon an incremental approach to updating the BVHM and using it to redetermine the Sustainable Yield. This approach focused on improving model estimates of historical and future pumping, and that other model refinements and model recalibration should be performed for future redeterminations of Sustainable Yield after 2025.

The availability of SGM grant funding provides an opportunity for the Watermaster to perform a more comprehensive update to the BVHM to support the redetermination of Sustainable Yield by 2025. The proposed scope of work includes comprehensive model updates (e.g., updated model versions, model grids, FMP, etc.), model recalibration, development and implementation of a transparent process to use model projections to redetermine the Sustainable Yield, comprehensive reporting, and model documentation. This approach not only provides a more defensible and robust redetermination of Sustainable Yield in 2025, but also provides long-term benefits to the Watermaster Parties by avoiding future expenses associated with model updates and recalibrations.

The Project will occur over an approximate three-year period concluding by June 30, 2025. The major tasks and subtasks are:

- Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan. The Watermaster will prepare a Redetermination of the Sustainable Yield Workplan (Workplan) under the guidance of the TAC and the Watermaster Board. Subtasks include:
  - Using the project description, cost estimates, and schedule proposed in this grant application, Watermaster staff will prepare a draft Workplan. The Workplan will include a detailed description of the steps and costs to perform Tasks 2 through 6.
  - The TAC will provide written comments and suggested revisions to Watermaster staff.
  - Watermaster staff will finalize the draft Workplan based on feedback received from the TAC. The TAC will recommend that the Board adopt the Workplan and authorize grant funds to implement the Workplan.

The Watermaster's Technical Consultant has estimated the likely tasks and subtasks that will be included in the Workplan:

- Task 9b: Model Improvements
  - Refine the finite-difference grid of the BVHM. The model domain is currently defined by a finite-difference grid of uniform cells with each cell being 2,000-feet by 2,000-feet, or approximately 92 acres in area. This relatively coarse cell size is a model limitation. First, hydraulic heads calculated by the model are average values across each model cell. Therefore, model-calculated hydraulic heads can vary considerably from measured heads at specific wells within the cell, which can limit the ability of the model to calibrate to measured heads. Second, the Farm Process Version 3 (FMP3) used in the current model only allows one land use type per cell. Therefore, the coarseness of the model grid may overstate the water demands of certain land-use types, like golf courses, and, consequently, overestimate the amount of groundwater pumped to meet the water demand. The goal of this task is to refine the finite-difference grid of the BVHM to allow for a more accurate spatial representation of land use type and assist in



model recalibration. Subtasks include:

- Refine the discretization of aquifer parameters, such as hydraulic conductivity and specific yield, by splitting each model grid cell into several smaller grid cells. The original value of the larger grid cell will be assigned to the smaller grid cells.
  - Rebuild the input files to the MODFLOW packages used by BVHM based on the newly refined grid, including the Flow and Head Boundary, Multi-Node Well 2, Time-Variant Specified Head, Streamflow-Routing, and Unsaturated Zone Flow packages.
  - For the input files to FMP3, refine the discretization of the following data by splitting each model grid cell into several smaller grid cells: land use, historical precipitation, potential evapotranspiration, ground surface elevation, designation of farms, and soil types. Update the refined data of land use and farms to better represent the actual spatial extent of land use types.
- Upgrade the current MODFLOW-OWHM Version 1 (MF-OWHM1) model input files to MODFLOW-OWHM Version 2 (MF-OWHM2) model input files. MF-OWHM2 was released by the USGS in 2020 and includes a variety of improvements to all the MODFLOW packages and a complete redevelopment of the Farm Process Version 4 (FMP4). Updates to FMP4 include, but are not limited to, the ability to specify multiple land-use types (crops) within a model cell, the ability to specify additional demand types not associated with land use, a “sand” soil type and bare-soil or fallow land use option, and a complete redesign of the input structure for easy maintenance and calibration. MF-OWHM2 also includes additional features to facilitate easier model updates, faster execution, and better runtime-error messages and reporting. The goal of this task is to take advantage of the improvements and additional features that are included in MF-OWHM2. Since MF-OWHM2 has been designed to maintain backward compatibility with all packages except FMP4, the only major changes to model input files will be those associated with FMP4. This task includes the following subtasks:
    - Create a new FMP4 input file with the new input structure. While the input style of the file will be changed, the information contained in the file will be consistent with the existing data contained in the FMP3 input file.
    - Make any additional changes to model input files necessary to get the newly upgraded MF-OWHM2 model to run.
  - Compare the results from the BVHM MF-OWHM1 model to the newly upgraded BVHM MF-OWHM2 model.
  - The TAC will review the model results and provide comments and suggested revisions to Watermaster staff.
- Task 9c: Extend the model through September 2022. The simulation period of the current BVHM is from October 1929 through September 2016. The work proposed in this subtask would extend the model simulation period through September 2022, adding six years of data to the model. Subtasks include:
    - Collect the required model input data from October 2016 through September 2022. The required input data includes monthly precipitation, evapotranspiration and runoff data obtained from the Basin Characterization Model (BCM), land use data obtained

- from arial imagery, monthly municipal pumping from Borrego Water District, and the number of current septic systems.
- Extend the model input files from October 2016 through September 2022 using the data collected in Task 3a.
  - Run the model.
  - The TAC will review the model results and provide comments and suggested revisions to Watermaster staff.
- Task 9d: Conduct Model Recalibration. The aquifer properties in the current BVHM were calibrated using observed water levels from 1945 to 2010. The work proposed in this subtask would include extending the calibration period to include observed water levels from 1945 to 2022. Additionally, newly acquired metered pumping data from October 2020 through September 2022 will be used to calibrate the Farm Process to better estimate the water demands for the various crops and golf courses being irrigated. This will enhance the ability of the BVHM to better estimate historical and future pumping which is essential to future redeterminations of the Sustainable Yield of the Subbasin. Subtasks include:
    - Construct the input data files for PEST.
    - Use PEST to calibrate the model.
    - Prepare a draft Technical Memorandum (TM): Update and Recalibration of the BVHM. This TM will document the results from Tasks 2, 3, and 4.
    - Conduct a meeting with the TAC to review the draft TM. The TAC will provide written comments and suggested revisions to Watermaster staff.
    - Prepare final TM. Watermaster staff will finalize the draft TM based on feedback received from the TAC. This TM will eventually become a chapter in the final report prepared in Task 6.
  - Task 9e: Redetermine the Sustainable Yield in 2025. Subtasks include:
    - Prepare a draft TM - Modeling Methods to Redetermine the Sustainable Yield. This TM will describe the process to develop and run projection scenarios, accounting for uncertainty in future pumping, land use changes, and climate change. The TM will also propose various options for interpreting the model results for the redetermination of the Sustainable Yield.
    - Conduct a meeting with the TAC to review the draft TM. The TAC will provide written comments and suggested revisions to Watermaster staff.
    - Prepare a final TM. Watermaster staff will finalize the draft TM based on feedback received from the TAC. The TAC will recommend that the Board adopt the process described in the TM and direct the TAC to proceed with the model simulations of the projection scenarios.
    - Run the model simulations pursuant to the process described in the TM.
    - Conduct a TAC meeting(s) to review the model results and the estimates of the Sustainable Yield. The TAC will provide written comments and suggested revisions to Watermaster staff.

- Task 9f: Prepare Final Report. The Watermaster will prepare a final technical report: Redetermination of the Sustainable Yield of the Borrego Springs Subbasin (2025). The report will include detailed documentation on the process and results of the model improvements, model extension, model recalibration, and use of the model to redetermine the Sustainable Yield. The technical report will include an appendix of detailed model documentation.

**Task 10. Prepare the 2025 GMP Update.** Pursuant to the Physical Solution, the Watermaster will evaluate its GMP at least every 5 years. The evaluation will include the elements of the annual reports and an assessment of the progress toward the sustainability goal. At a minimum, the 5-year evaluation will include the elements required Pursuant to CCR Section 356.4. the assessment will include the following components: current groundwater conditions; implementation progress on the pumping rampdown and other PMAs; evaluation and update (as appropriate) of plan elements such as undesirable results, minimum thresholds, management areas etc.; water budget review; sustainable yield, description of the monitoring network and data gaps; new information; enforcement actions, stakeholder outreach and coordination efforts, and plan amendments. The plan will be presented in a series of workshops for stakeholder input as part of the Watermaster's regular meeting process.

**Task 11. Stakeholder Outreach.** The objectives of this task are to facilitate public outreach and communications of Watermaster planned actions and provide a venue to receive public input prior to making Watermaster decisions. Outreach to the community through regular Watermaster meetings is critical to maintain support for the mission of achieving sustainability.

- Task 11a. Board Meetings. The Board will meet approximately ten times per year to conduct its decision-making process on the implementation of the Physical Solution and GMP. Detailed memos are prepared in support of each meeting on the subject matter and are posted to Watermaster's website and email list for distribution to interested stakeholders. The public is afforded an opportunity to provide comments to the Watermaster on items not on the agenda and on each agenda item. All public input is recorded in meeting minutes. During the grant period, the Watermaster will include a standing agenda item on implementation progress of grant activities. During the grant period the Board will meet 36 times, the budget assumes about two-thirds of these Board meetings will be related to outreach on the Project.
- Task 11b: TAC Meetings. The TAC meets approximately four times per year to review data, review Watermaster's technical activities described in the Judgment, and make recommendations to the Watermaster based on best science and data collected in support of sustainable management. Detailed memos are prepared in support of each meeting on the subject matter and are posted to Watermaster's for distribution to interested stakeholders. The key business of the TAC each year includes: discussion of the redetermination of Sustainable Yield (see Task 9), review of the Watermaster's pumping metering program, development and review of the WQMP, review of the groundwater and surface water monitoring programs. TAC meetings are working meetings critical to the consensus-based advancement of the monitoring and reporting tasks in this program and also represent a key venue for outreach to and input from interested Stakeholders. During the grant reporting period, the TAC will meet 15 times.
- Task 11c. Stakeholder Workshops and Open House. The Watermaster will hold up to two events per year to perform additional outreach to interested stakeholders in the Basin. The events are intended to be an open forum to present relevant information on the latest Watermaster and sustainable management activities and receive stakeholder input to report

to the Board. During the grant period, six Stakeholder Workshops will be held. The intent is to hold the workshops in-person, health and safety permitting. Virtual workshops will be held, if necessary.

- Task 11d. Maintain Website, Distribution List, and Respond to Stakeholder Inquiries. The Watermaster will maintain its website and an interested stakeholder distribution list to advertise meetings, disseminate important information, and call for input at Watermaster hearings that are required by the Judgment prior to Board action on key decisions.

**Task 12. Project Management and Grant Reporting.** Subtasks include:

- Task 12a. Project Management. The objective of this task is to perform monthly project management activities for the program, including coordinating work, tracking task schedules and budget, managing sub-consultants and vendors, reporting progress to the Watermaster Board, TAC and EWG, and taking actions as necessary to address schedule or budget challenges.
- Task 12b. Grant Management and Reporting. The objective of this task is to coordinate with the Borrego Water District to manage grant agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with the Grantee, Borrego Water District. Prepare invoices including relevant supporting documentation for submittal to DWR via Borrego Water District. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.

**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 is located in the Borrego Springs Subbasin (Basin) of the Borrego Valley Groundwater Basin. Exhibit B is a map of the general location of the Basin and Exhibit C is a map that shows the location of the Basin along with time-history charts of groundwater levels at key wells in the three Basin Management Areas (MAs): North, Central and South.

The Basin has been, and presently is, in a condition of long-term overdraft and there is no viable means to remedy the overdraft through artificial recharge or other supply augmentation strategy under current Basin conditions and pumping quantities. Therefore, it is necessary to implement the Physical Solution, which provides for an immediate and aggressive rampdown of annual pumping over the next twenty years. The Court deemed that the evidence to support its conclusion that the Physical Solution appropriately balances competing economic, social, and environmental considerations, and that it will result in the optimal management of the Basin. The Physical Solution will accelerate water-saving actions and provide flexibility and adaptability in order to maximize the reasonable and beneficial use of the Basin's Groundwater and protect against undue economic harm to the Borrego Springs community.

The entire Basin will benefit from the project as it endeavors to implement the key monitoring, analysis, and reporting efforts necessary to ensure the effective implementation of the pumping rampdown which is the cornerstone action in the Physical Solution to achieve sustainability by 2040.

**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 Judgment which adjudicates all groundwater rights in the Basin provides a physical solution for the perpetual management of the Basin to achieve sustainable groundwater management consistent with the substantive objectives of the SGMA and with reasonable and beneficial use pursuant to the California Constitution. The Judgment considered together with the Groundwater Management Plan (GMP; included as Exhibit 1 to the Judgment) constitutes the Physical Solution for the Basin and serves as the technical approach to achieve sustainability. The Physical Solution is intended to provide flexibility and adaptability to allow the Court to use existing and future technological, social, institutional, and economic options to maximize reasonable and beneficial water use in the Basin. The Physical Solution (e.g., the Judgment and GMP) was submitted to the California Department of Water Resources (DWR) as an Alternative to a GSP in June 2021. Please refer to the Project Description above for a more thorough description of the background and objectives of the Judgment and GMP.

The Project described herein is the implementation plan for the Judgment and GMP. Therefore, implementing the Project will ensure a viable water supply for current and future beneficial uses and users of groundwater in the Subbasin over the planning and implementation horizon of the GMP, and ensure that the Subbasin is operated within its Sustainable Yield and does not exhibit Undesirable Results as defined by California Water Code Section 10721(x).

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

The goals and needs of the project are to ensure that the Basin achieves its sustainability goal to operate at the sustainable yield by 2040. The implementation of the comprehensive program to monitor, analyze, and report on key hydrogeologic data as provided for by the Physical Solution is paramount to successfully achieving the sustainability goal of the Basin in a manner that complies with the Judgment and seeks input from the local community on a regular basis.

The proposed project for *Monitoring, Reporting, and GMP Update for Sustainable Management in the Borrego Springs Subbasin* is a comprehensive monitoring, analysis, data management and reporting program to that will ensure the effective implementation of the pumping rampdown, including filling data gaps identified in the Judgment and GMP, and performing the required redetermination of the Sustainable Yield and GMP update due in 2025.

The Watermaster is the responsible entity to develop, contract, and carry out Physical Solution activities to ensure this happens. The Board recognizes that some activities may best be implemented in coordination with the Borrego Water District (BWD) or other parties to achieve efficiencies, when doing so is consistent with the Judgment, Physical Solution and established Governance structure for decision making and approval. The Watermaster anticipates implementing components of this project in coordination with the BWD where appropriate to achieve efficiencies, stay on schedule, and obtain support for community outreach efforts.

**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 benefits of the project are the development of the robust data sets needed to assess if the key elements of the Physical Solution are achieving the desired results including, but not limited to reductions in pumping, decreased rate of water level declines, water quality consistent with drinking water regulations, and refined estimation of water budget components. These benefits can be quantified in a multitude of ways by analyzing the datasets and quantifying changed basin conditions, such as:

- Demonstrating reductions in pumping through groundwater pumping monitoring
- Demonstrating groundwater level trends through groundwater level monitoring
- Demonstrating groundwater level trends through groundwater storage estimations
- Demonstrating groundwater quality trends through groundwater quality monitoring
- Demonstrating improved estimation of sustainable yield through model recalibration

**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 Project serves the entire Basin including the community of Borrego Springs and the area classified as a SDAC. Exhibit D is a map of the Basin and the area defined as a SDAC.

- The community's water supply is solely dependent on the Basin. The Project ensures that the groundwater basin remains an affordable, high-quality source of water for the community in perpetuity.
- The Watermaster was officially formed in April 2021. Expenses to conduct Watermaster activities are relatively new costs that are ultimately funded by the residents and rate payers within the community. The grant funding will help offset the new costs and provide financial relief to the residents and rate payers.
- A primary driver of the economy in Borrego Springs is ecotourism associated with the Anza-Borrego State Park, dark and clear night skies, and the beautiful flora and fauna of the region. The Project will help maintain or enhance the physical and biological environment within the community, and thereby support economic activity within Borrego Springs.

**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.**

The Judgment and the GMP addressed the future impacts on private shallow wells by accelerating pumping reductions as compared to what is required by SGMA. Subtasks that accelerate GMP tasks to fill in data gaps will reduce risks associated with water quality and shallow wells, as the Watermaster will have better data to manage the basin sustainably without Undesirable Results.



**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 Physical Solution addresses these issues as follows:

- Water quality monitoring is essential to avoiding undesirable results and achieving sustainable groundwater management in the Basin. The Physical Solution provides for the development of a water quality monitoring plan that will be implemented to characterize and track water quality trends in the basin and develop remedies for significant and unreasonable changes in quality under the water quality optimization PMA (Judgement Section VI.B). Construction of new monitoring wells should be considered in areas where data gaps can’t be filled with existing wells.
- The Watermaster will cooperate with the County in the enforcement of the well abandonment ordinance as improperly abandoned wells have the potential to provide a mitigation pathway of contaminants into the Basin (Judgement Section X.B).

**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?**

As of 2019, the Borrego Water District calculated the human right to water at under 400 afy.

The Physical Solution addresses the human right to water as follows:

- By achieving its sustainability goal, the Physical Solution is intended to protect the long-term beneficial uses and users of groundwater.
- Even after the period of the rampdown of groundwater pumping rights (2040), it is expected that groundwater availability for domestic uses will exceed the calculated human right to water.
- The Judgment allows for *de minimis* pumping (i.e. pumping less than 2 afy) by domestic users.
- Implementation of the Physical Solution explicitly requires ongoing evaluation of water quality and avoidance of undesirable water quality conditions.

**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 Physical Solution recognizes that climate change enhances the probability, magnitude, and periodicity of extreme precipitation events and that recharge over the 20-year GMP implementation period is an estimation. As such, the interim milestones for chronic lowering of groundwater levels will be closely monitored to determine whether the Basin is on track to achieve its sustainability goals. The Watermaster will annually review actual Basin groundwater extraction, historical and contemporary groundwater-level trends, changes in groundwater storage, and climatic condition (i.e., dry, normal, wet year/period) to determine whether metrics indicate the Basin is on track to achieve its sustainability goals.

The project does not include any measures to reduce greenhouse gas emissions or sequester carbon. However, there are no significant facilities required to achieve the pumping rampdown.

Fallowing could cause reduced carbon sequestration, but the EWG is exploring biological restoration of fallowed lands as a technique to mitigate this potential impact, among other impacts associated with fallowing.

## Work Plan

*The Work Plan must contain descriptions of the anticipated tasks necessary to complete the project. Tasks should be organized by the five budget categories, as applicable: (a) Project Administration, (b) Planning/Design/Environmental, (c) Construction/Implementation, (d) Monitoring/Assessment, and (e) Interested Parties Outreach/Education. The Work Plan should also identify the anticipated deliverables for each task.*

*Add additional tasks and subtasks as needed to provide a detailed work plan. Some examples and suggested language have been provided.*

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

**Task 12. Project Management and Grant Reporting.** Subtasks include:

- Task 12a. Project Management
- Task 12b. Grant Management and Reporting

**Deliverables:**

- Invoices and necessary documentation.

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

None

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

**Task 5. Construction of New Monitoring Facilities.** Subtasks include:

- Task 5a. Construct multi- completion monitoring well.
- Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek.
- Task 5c. Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink
- Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink.

**Deliverables:**

- CEQA determinations and permits
- Well technical specifications
- Well completion reports (draft and final)
- Surface water monitoring station design and completion report

**Task 6. Identify and Address Improperly Abandoned Wells.** Subtasks include:

- Task 6a - Outreach.
- Task 6b - Well Abandonment

- Task 6c - Conversion of Abandoned Wells to Monitoring Wells.

**Deliverables:**

- Documentation of proper abandonment
- Documentation of conversion to monitoring wells

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

**Task 1. Groundwater Pumping Monitoring.** Subtasks include:

- Task 1a - Monthly meter reading and pumping calculations.
- Task 1b - Annual meter accuracy testing.
- Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable.

**Deliverables:**

- Semi-annual monitoring summary reports
- Annual water rights accounting report

**Task 2 - Groundwater Level Monitoring.** Subtasks include:

- Task 1a - Monthly meter reading and pumping calculations.
- Task 2b - Expand Monitoring Network through Outreach.
- Task 2c - Prepare monitoring well construction work plan.
- Task 2d - Aquifer testing

**Deliverables:**

- Data delivered to CEDEN, GAMA and other platforms requested by DWR
- Semi-annual monitoring summary reports
- Draft and final monitoring well construction work plan
- Draft and final aquifer testing work plan
- Draft and final aquifer testing report

**Task 3 - Groundwater Quality Monitoring.** Subtasks include:

- Task 3a - Implement the existing and future expanded groundwater-quality monitoring program.
- Task 3b - Prepare Water-Quality Monitoring Plan (WQMP).

**Deliverables:**

- Data delivered to CEDEN, GAMA and other platforms requested by DWR

- Semi-annual monitoring summary reports
- Draft and final WQMP

**Task 4 - Surface Water Flow Monitoring.** The objective of this task to implement a surface water monitoring program to collect data that can be used in the BVHM to assess Basin recharge and the Sustainable Yield. In the first year of the grant period, this task will involve the current flow monitoring on Coyote Creek described in the GMP and will be expanded after completion of the surface-water discharge station described in Task 5b.

**Deliverables:**

- Data delivered to CEDEN, GAMA and other platforms requested by DWR

**Task 7. Maintain and Enhance the Data Management System.** The objective of this task to maintain and improve the Watermaster's Data Management System for efficient reporting in compliance with Judgment and Grant requirements. As part of this task, Watermaster will develop specific reporting tools to efficiently report data to CASGEM, CEDEN, GAMA, or other required platforms. Additional tools may be developed to improve the efficiency of data analysis and report of production, water level, and water quality data.

**Deliverables:**

- Data delivered to CASGEM, CEDEN, GAMA and other platforms requested by DWR

**Task 8. Annual Reporting to DWR and the Court.** This task is to prepare the four annual reports that are due to the DWR and Court during the grant period

**Deliverables:**

- Draft and Final Annual Reports for WY 2021, 2022, 2023, and 2024.

**Task 9. Redetermination of the Sustainable Yield by 2025.** Perform a comprehensive update to the BVHM to support the redetermination of Sustainable Yield by 2025. Subtasks include:

- Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan
- Task 9b: Model Improvements
- Task 9c: Extend the model through September 2022
- Task 9d: Conduct Model Recalibration
- Task 9e: Redetermine the Sustainable Yield in 2025
- Task 9f: Prepare Final Report

**Deliverables:**

The following draft and final TMs and reports:

- Redetermination of the Sustainable Yield Workplan

- Update and Recalibration of the BVHM
- Modeling Methods to Redetermine the Sustainable Yield
- Redetermination of the Sustainable Yield of the Borrego Springs Subbasin (2025)

**Task 10. Prepare the 2025 GMP Update.** This task is to prepare and adopt the 2020 GMP Update by June 30, 2025

**Deliverables:**

- Draft and Final 2025 GMP

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

**Task 11. Stakeholder Outreach.**

- Task 11a. Board Meetings
- Task 11b. TAC Meetings
- Task 11c. Stakeholder Workshops
- Task 11d. Maintain Website, Distribution List, and Respond to stakeholder inquiries

**Deliverables:**

- Meeting agendas and packets; meeting presentations; meeting summaries; Stakeholder outreach materials



# Budget

DWR required budget categories have been included below. Add tasks as applicable; additional rows must be added under the applicable categories to present the cost of each task described in the Work Plan.

**ALL LOCAL COST-SHARE IS PROVIDED BY THE BORREGO SPRINGS WATERMASTER AND REPRESENTS COSTS INCURRED ON THE PROJECT FROM JANUARY 1, 2022 THROUGH MARCH 31, 2022.**

		(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>				
	Task 12a. Project Management	\$175,000	\$2,500	\$172,500	1%
	Task 12b. Grant Management and Reporting	\$45,000	\$0	\$45,000	0%
<b>(b)</b>	<b>Planning/Design/Environmental</b>				
	<i>none</i>				
<b>(c)</b>	<b>Construction/Implementation</b>				
	Task 5a. Construct multi-completion monitoring well.	\$750,000	\$0	\$750,000	0%
	Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek.	\$89,000	\$0	\$89,000	0%
	Task 5c. Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent	\$100,000	\$0	\$100,000	0%

	ecosystem near the Borrego Sink				
	Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink.	\$100,000	\$0	\$100,000	0%
	Task 6a. Outreach.	\$10,000	\$0	\$10,000	0%
	Task 6b. Well Abandonment	\$198,000	\$0	\$198,000	0%
	Task 6c. Conversion of Abandoned Wells to Monitoring Wells.	\$132,000	\$0	\$132,000	0%
<b>(d)</b>	<b>Monitoring/Assessment</b>				
	Task 1a - Monthly meter reading and pumping calculations.	\$95,000	\$7,000	\$102,000	7%
	Task 1b - Annual meter accuracy testing.	\$65,000	\$0	\$65,000	0%
	Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable.	\$13,000	\$0	\$13,000	0%
	Task 2a - Implement the existing and future expanded groundwater-level monitoring program.	\$105,000	\$9,000	\$114,000	8%
	Task 2b - Expand Monitoring Network through Outreach.	\$10,000	\$0	\$10,000	0%

Task 2c - Prepare monitoring well construction work plan.	\$25,000	\$0	\$25,000	0%
Task 2d – Aquifer testing	\$65,000	\$0	\$65,000	0%
Task 3a - Implement the existing and future expanded groundwater-quality monitoring program.	\$145,000	\$17,000	\$162,000	11%
Task 3b - Prepare Water-Quality Monitoring Plan (WQMP).	\$35,000	\$0	\$35,000	0%
Task 4. Surface Water Flow Monitoring.	\$90,000	\$2,000	\$92,000	2%
Task 7. Maintain and Enhance the Data Management System.	\$57,000	\$3,000	\$60,000	5%
Task 8. Annual Reporting to DWR and the Court.	\$125,000	\$35,000	\$160,000	22%
Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan.	\$50,000	\$0	\$50,000	0%
Task 9b: Perform Model Improvements.	\$100,000	\$0	\$100,000	0%
Task 9c: Extend the model through September 2022	\$100,000	\$0	\$100,000	0%
Task 9d: Conduct Model Recalibration	\$150,000	\$0	\$150,000	0%
Task 9e: Redetermine the Sustainable Yield in 2025	\$150,000	\$0	\$150,000	0%
Task 9f: Prepare Final Report.	\$100,000	\$0	\$100,000	0%
Task 10. Prepare the 2025 GMP Update.	\$190,000	\$0	\$190,000	0%

<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>				
	Task 11a. Board Meetings.	\$255,000	\$85,000	\$340,000	25%
	Task 11b: TAC Meetings.	\$105,000	\$15,000	\$120,000	13%
	Task 11c. Stakeholder Workshops and Open House.	\$45,000	\$0	\$45,000	0%
	Task 11d. Maintain Website, Distribution List, and Respond to Stakeholder Inquiries.	\$15,000	\$0	\$15,000	0%
<b>(f)</b>	<b>Grand Total (Sum rows (a) through (d) for each column)</b>	\$3,684,000	\$175,500	\$3,859,500	5%

\* List sources of Local Cost Share funding:

## Schedule

The Schedule must be organized in a manner that is consistent with the Work Plan and Budget that will be contained in the Grant Agreement. The Schedule Table presented below is a template that must be completed for each project in the proposal. The required budget categories have been included below. Add additional rows for each task as described in the Work Plan and Budget.

<b>Categories</b>		<b>Start Date (Earliest Start Date)</b>	<b>End Date (Latest End Date)</b>
<b>(a)</b>	<b>Project Administration</b>	<b>01/01/2022</b>	<b>6/30/2025</b>
	Task 12a. Project Management.	01/01/2022	06/30/2025
	Task 12b. Grant Management and Reporting.	4/30/2022	6/30/2025
<b>(b)</b>	<b>Planning/Design/Environmental</b>	-	-
	None	-	-
<b>(c)</b>	<b>Construction/Implementation</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 5a. Construct multi- completion monitoring well.	4/1/2022	6/30/2025
	Task 5b. Construct and equip a surface-water discharge monitoring station in Coyote Creek.	4/1/2022	10/1/2023
	Task 5c. Construct and equip a shallow dual-nested monitoring well facility within the potential groundwater dependent ecosystem near the Borrego Sink	4/1/2022	10/1/2023
	Task 5d. Construct and equip a surface-water monitoring station within the potential groundwater dependent ecosystem near the Borrego Sink.	4/1/2022	10/1/2023
	Task 6a. Outreach.	1/1/2022	6/30/2025
	Task 6b. Well Abandonment	1/1/2022	6/30/2025
	Task 6c. Conversion of Abandoned Wells to Monitoring Wells.	1/1/2022	6/30/2025
<b>(d)</b>	<b>Monitoring/Assessment</b>	<b>4/1/2022</b>	<b>6/30/2025</b>
	Task 1a - Monthly meter reading and pumping calculations.	1/1/2022	6/30/2025
	Task 1b - Annual meter accuracy testing.	08/01/2022	12/31/2024
	Task 1c - Outreach to existing and new de minimis pumpers to cooperate in pumping monitoring efforts, including collecting well data, and meter reading if applicable.	1/1/2022	6/30/2025

	Task 2a - Implement the existing and future expanded groundwater-level monitoring program.	1/1/2022	6/30/2025
	Task 2b - Expand Monitoring Network through Outreach.	4/1/2022	6/30/2021
	Task 2c - Prepare monitoring well construction work plan.	11/1/2022	5/1/2023
	Task 2d. Aquifer testing.	10/1/2022	9/30/2023
	Task 3a - Implement the existing and future expanded groundwater-quality monitoring program.	1/1/2022	6/30/2025
	Task 3b - Prepare Water-Quality Monitoring Plan (WQMP).	4/15/2022	4/1/2023
	Task 4. Surface Water Flow Monitoring.	01/01/2022	6/30/2025
	Task 7. Maintain and Enhance the Data Management System.	01/01/2022	6/30/2025
	Task 8. Annual Reporting to DWR and the Court.	1/1/2022	4/30/2025
	Task 9a: Prepare the Redetermination of the Sustainable Yield Workplan	4/1/2022	6/1/2022
	Task 9b: Perform Model Improvements	7/1/2022	11/30/2022
	Task 9c: Extend the model through September 2022	12/1/2023	4/30/2023
	Task 9d: Conduct Model Recalibration	5/1/2023	11/30/2024
	Task 9e: Redetermine the Sustainable Yield in 2025	12/1/2023	7/31/2024
	Task 9f: Prepare Final Report	8/1/2024	12/31/2024
	Task 10. Prepare the 2025 GMP Update.	6/1/2024	7/30/2025
<b>(e)</b>	<b>Interested Parties Outreach/Public Education</b>	<b>01/01/2022</b>	<b>6/30/2025</b>
	Task 11a. Board Meetings.	01/01/2022	6/30/2025
	Task 11b: TAC Meetings.	01/01/2022	6/30/2025
	Task 11c. Stakeholder Workshops and Open House.	06/01/2022	6/30/2025
	Task 11d. Maintain Website, Distribution List, and Respond to Stakeholder Inquiries.	01/01/2022	6/30/2025



January 20, 2022

Samantha Adams

Borrego Springs Watermaster

**Subject:** *Working Draft Proposition 68 Grant Project Support for Borrego Springs Coyote Creek Alternative Stream Monitoring*

Dear Ms. Adams:

Dudek is providing this scope for alternative stream monitoring at Coyote Creek in Borrego Springs as a potential project component of the Proposition 68 Grant Project. This scope provides a first order estimate.

As identified in the GMP, approximately 65% of the surface water inflow to the Borrego Valley comes from Coyote Creek (USGS 1982). The watershed encompasses approximately 180 square miles and is located almost entirely within the boundary of the Anza-Borrego Desert State Park. Streamflow in the Coyote Creek Watershed has been documented by USGS as the number one source of recharge to the Basin via streamflow leakage (i.e., infiltration of surface water runoff). Two historical stream gages were located on Coyote Creek, one of which stopped recording streamflow in 1983, and the other stopped recording flow in 1993. USGS Station Number 1025580 (Upper-Northern) recorded daily discharge data from 1951–1983; at this station, annual average streamflow was measured to be 1,831 AFY (USGS 2017). USGS Station Number 10255805 (Lower-Southern) recorded daily discharge data from 1983–1993; at this station, annual average streamflow was measured to be 1,774 AFY (USGS 2017). Annual variability over the period measured ranges from 326 acre-feet to 10,715 acre-feet. This large annual variability is a function of large annual variability of precipitation falling on the Coyote Creek Watershed. The BWD and Watermaster have been periodically taking manual stream flow measurements along perennial reaches of Coyote Creek since the Spring of 2018.

The BWD, DWR and USGS conducted a site reconnaissance during the GMP preparation to determine if a stream gage could be reactivated along Coyote Creek. Due to the dynamic nature of the braided alluvial fan—high sedimentation and erosion that occurs along Coyote Creek—it was determined by the agencies that Coyote Creek was not a good candidate for a traditional stream gage.

This project provides for installation of camera (ECAM or equivalent) and staff gauge to document high flows in Coyote Creek. The ECAM camera is a standalone, cellular, solar, and battery operated camera that can be accessed 24 hours per day 7 days per week and configured to push images to a website. This infrastructure has successfully been deployed by the Santa Barbara County Flood Control District. It is anticipated that the ECAM will be mounted at the approximate historical location of USGS Station Number 10255805 where the ECAM will likely be mounted on top of an existing metal building or on a standalone tower. This proposed location is also the general location of the San Diego County Flood Control's Coyote Creek Station 27034 rain gauge. The BWD will coordinate with San Diego County Flood Control and Anza-Borrego Desert Research Center to determine whether the ECAM can use existing telemetry infrastructure already deployed in the Basin. In order to calculate stream flow discharge, a survey of the cross-sectional area of Coyote Creek at the proposed location of the staff gauge and upstream and downstream of the staff gauge location will be completed. A rating curve displaying discharge versus stage at the location of the staff gauge will be developed in order to determine stream flow discharge using the staff gauge as recorded by the ECAM. Due to the shifting nature of the stream channel geometry it is anticipated that the Coyote Creek channel will likely need to be resurveyed at least annually and after major flood events. The rating curve would also require updating as part of the channel resurvey. The estimated cost to complete the Coyote Creek streamflow monitoring is **\$160,000**, including contingency for the channel shifting.

**Task 1 – Survey**

A 1-D model will be used to generate the stage-discharge curve. The modeling software that will be used is the River Analysis System developed by the Hydrologic Engineer Center, U.S. Army Corps of Engineers also referred to as HEC-RAS. As part of the model development, terrain data is needed of the channel at the intended installation location. It was assumed that no more than 10 cross-sections will be required when generating the cost estimate. Since the channel has a history of shifting, the cross-sections will cover all visible historical channels in the area of interest. The cost estimate for surveying includes preparation, surveying field work and post-processing the data for input into the model.

**Cost for Task 1 .....\$22,000.00**

**Task 2 – Model Development**

A 1D HEC-RAS model will be developed of the channel segment where the stream gage and camera are to be installed. To do this, information about the channel will be entered into the HEC-RAS program, namely, ground elevations and the type of ground cover. The ground cover is important because dense grass affects the river flow more than clear sand. It is assumed that historic data from USGS is available for use in the model, in addition to, the field data collected by Dudek.

**Cost for Task 2 .....\$23,500.00**

**Task 3 – Stage-Discharge Rating Curve**

To create the stage-discharge rating curve, the model will be run for various stream flows. The results will provide corresponding water surface elevations. Each water surface elevation and streamflow pair will be one point on the stage-discharge rating curve. Then, as long as the channel conditions remain the same, the curve can be used to estimate streamflow given the height of the water surface on the staff gage.

**Cost for Task 3 .....\$7,000.00**

**Task 4 – Initial Installation of Camera and Staff Gage**

This task captures the cost of installing the staff gage and camera at the site.

**Cost for Task 4 .....\$35,000.00**

**Task 5 – Monitoring/Assessment**

The site will be monitored for three years. This involves manual measurements, maintenance of the equipment and updating the stage-discharge rating curve as conditions at the site change. It is assumed that a storm large enough to change the channel characteristics will occur about once a year for the two subsequent years after the initial installation. Therefore, the budget includes two additional surveys of the established cross-sections. Then after each re-survey; the model will be updated, re-run and the rating curve will be regenerated. Also included are manual measurements of the water surface elevation and corresponding streamflow each year for a total of three trips.

Ms. Samantha Adams

Subject: Working Draft Proposition 68 Grant Project Support for Borrego Springs Coyote Creek Alternative Stream Monitoring

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**Cost for Task 5 .....\$63,000.00**


**OPTIONAL**

The stream has been known to create and shift to a new channel during a large storm. This optional task assumes that this may happen one time during the three-year monitoring duration and includes the cost of moving the equipment to a new location. It is assumed that the equipment is not damaged and remains functional.

**Cost for Optional Task.....\$8,000.00**

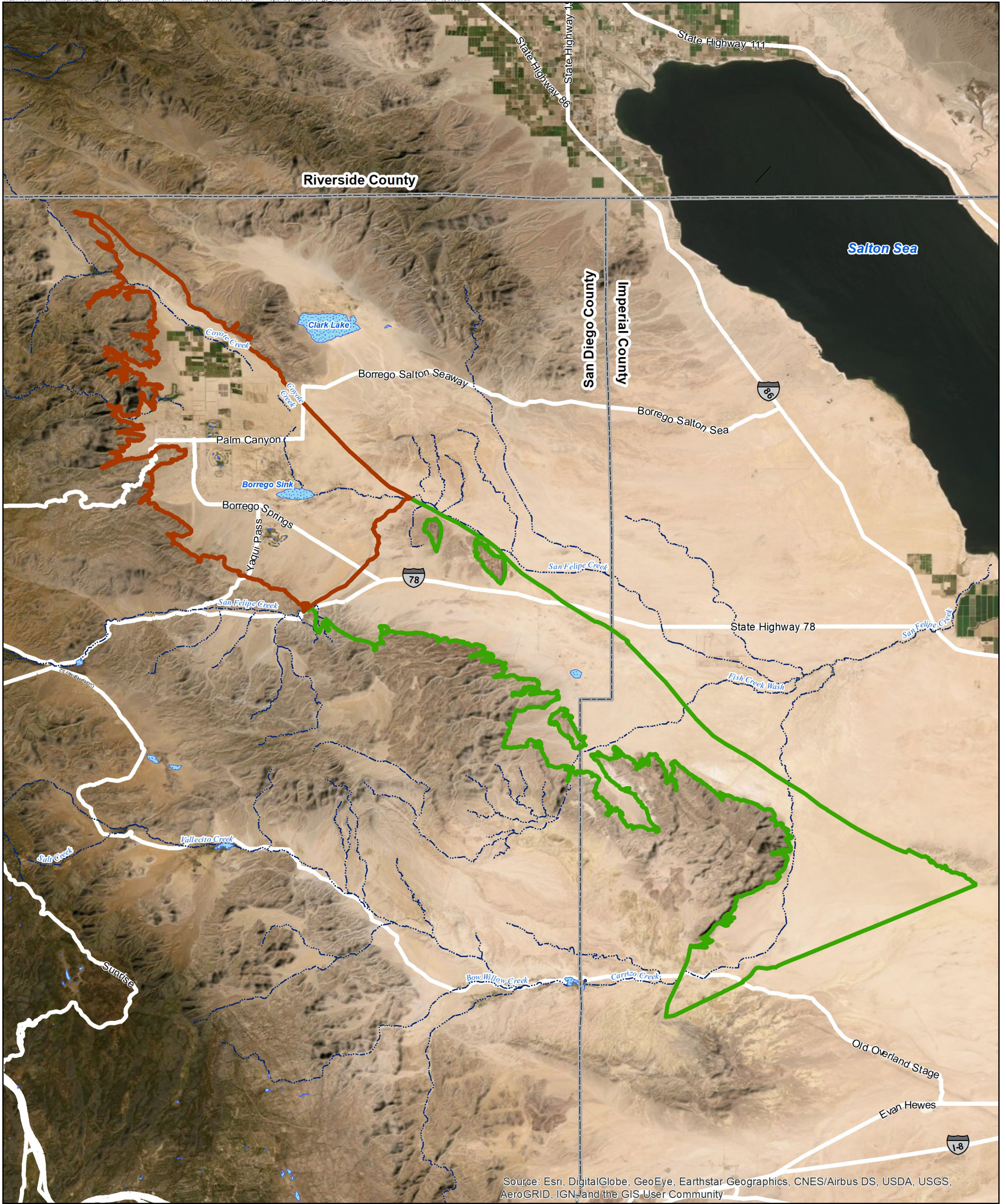
Dudek appreciates this opportunity to assist you. If you have any questions or require further discussion, please contact me at 760.415.1425.

Sincerely,

  
\_\_\_\_\_  
Trey Driscoll, PG No. 8511, CHG No. 936  
Senior Principal Hydrogeologist

cc: Amy Lynn-Williams, Dudek





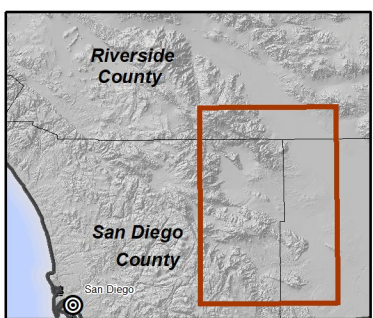
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**Borrego Valley Groundwater Basin Subbasins**

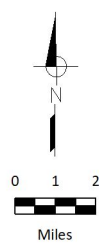
- Borrego Springs Groundwater Subbasin (7-024.01)
- Ocotillo Wells Groundwater Subbasin (7-024.02)

**Surface Water Features**

- Streams
- Dry Lake



Notes:  
1. Source: Borrego Springs Groundwater Subbasin Annual Report: Covering Water Years 2016 through 2019 (Dudek, 2020).



**Figure 1**

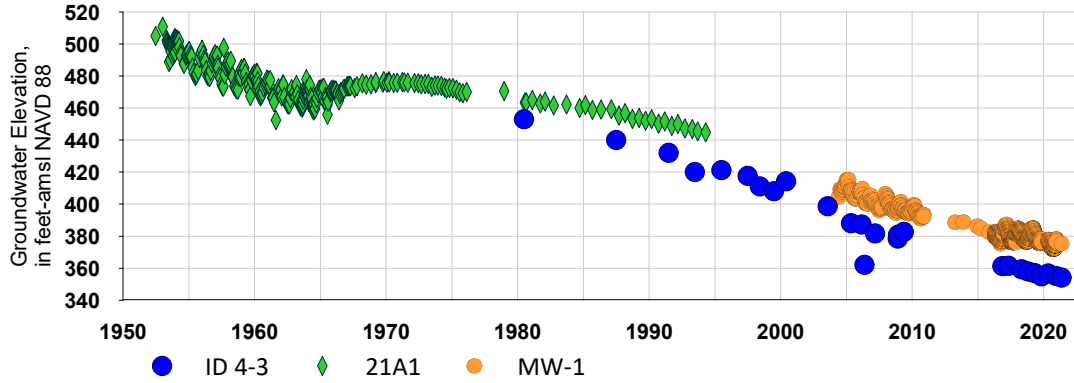
**Borrego Springs Groundwater Subbasin Location Map**



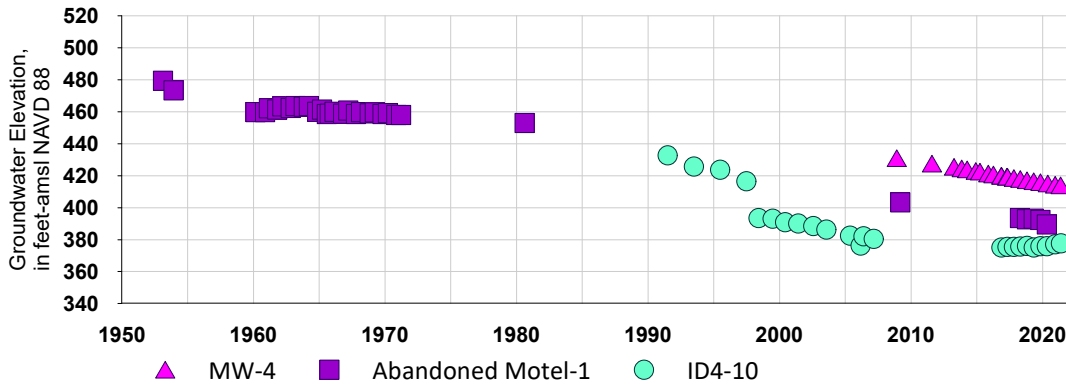
Borrego Springs Watermaster  
Borrego Springs Subbasin  
2020 Annual Report



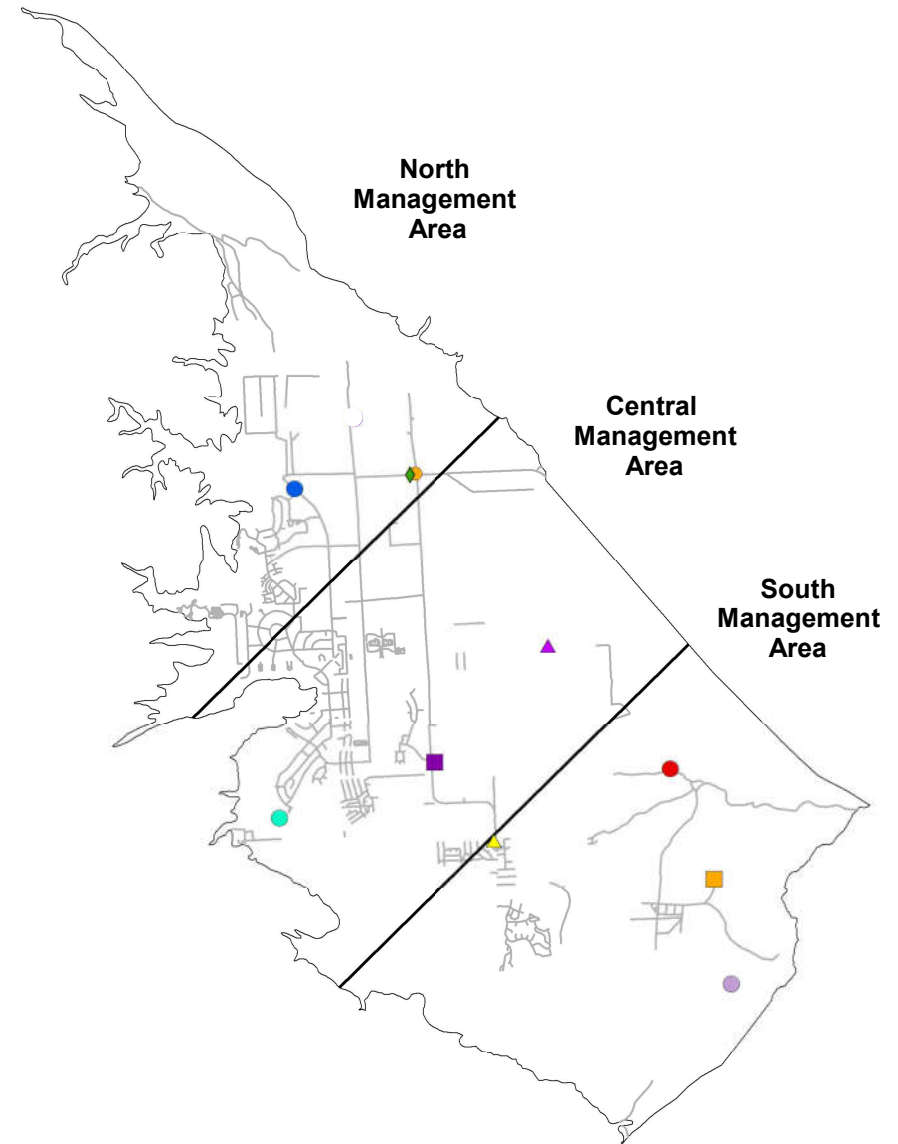
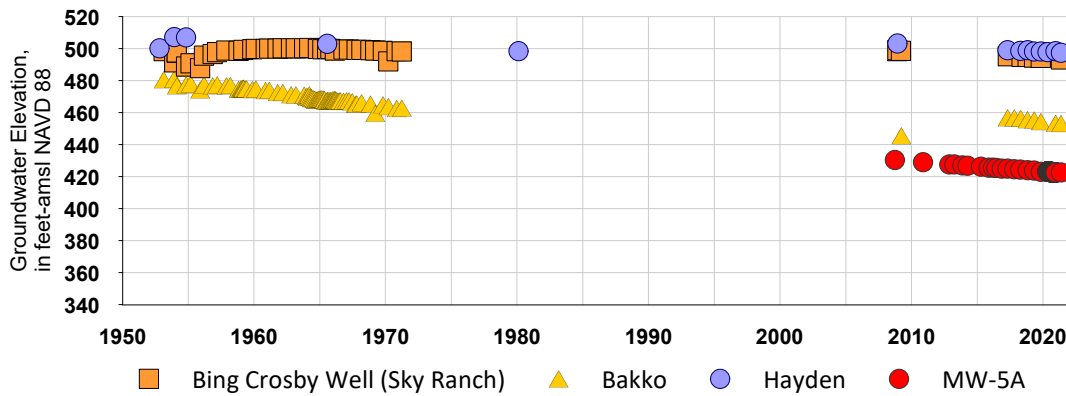
### North Management Area

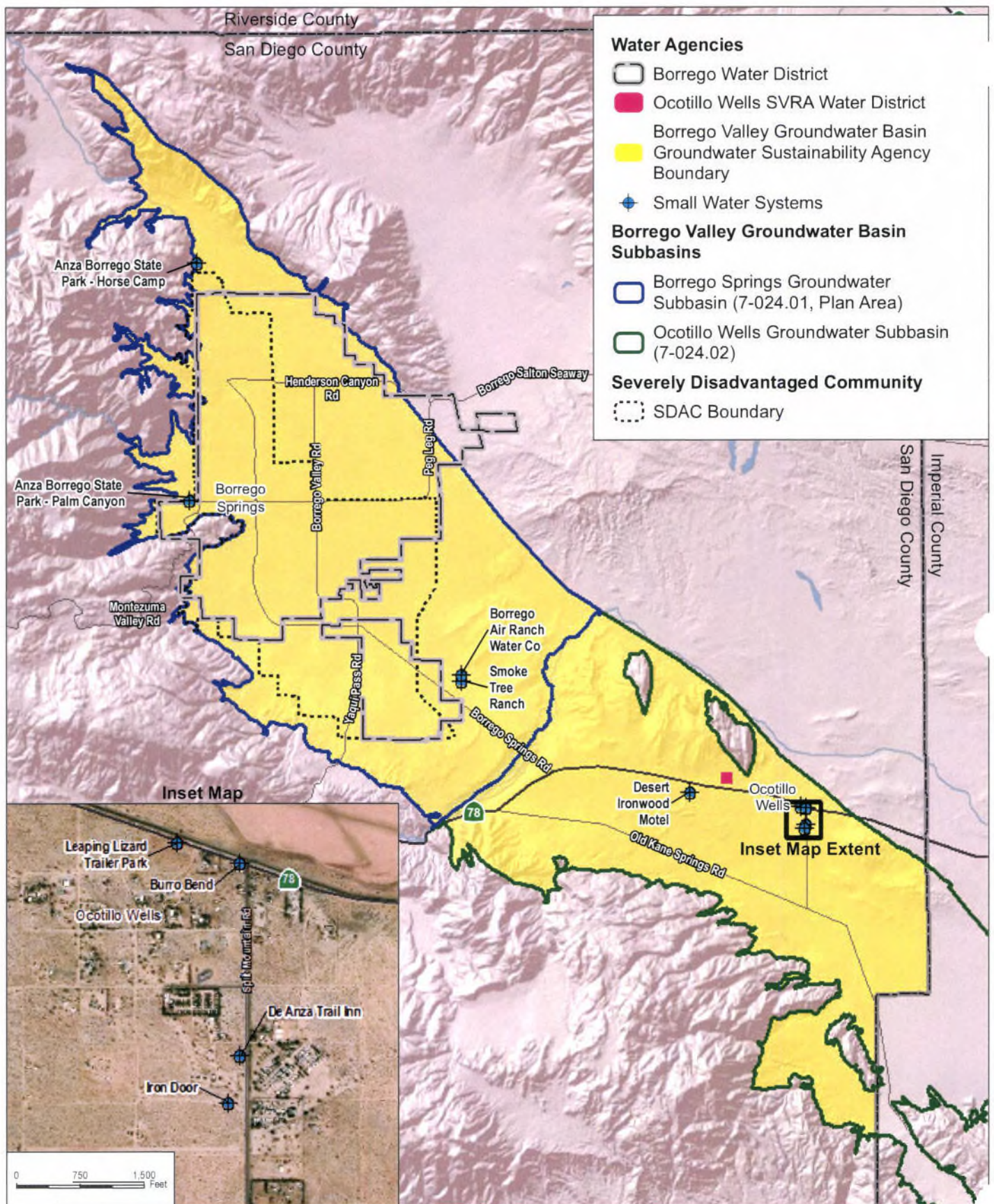


### Central Management Area



### South Management Area





DATUM: NAD 1983. DATA SOURCE: DWR 2015; San Diego County

January 2020

**DUDER**

0 1.5 3 Miles

Figure 2.1-2

Water Purveyors within the Groundwater Sustainability Agency Boundary

Groundwater Sustainability Plan for the Borrego Springs Groundwater Subbasin



# Borrego Springs Youth and Seniors Center, Inc.

PO Box 1362

Borrego Springs, CA 92004

A 501(C)(3) Charitable Nonprofit Corporation

January 17, 2022

To: California Department of Water Resources (DWR)

We understand that the Borrego Springs Watermaster is submitting several Project proposals to include in a grant application "spending plan" for the DWR's Sustainable Groundwater Management Grant Program under Proposition 68 and the 2021 Budget Act. We understand the Watermaster's project proposals to be the following:

- **Watermaster Monitoring, Reporting, and Update to the Groundwater Management Plan.** This project covers a broad range of Watermaster tasks that include: conducting monitoring programs (e.g. groundwater-level and water quality); reporting on the monitoring programs; and updating the Groundwater Management Plan as required by the DWR. The activities included in this project will help the Watermaster comply with the Judgment and the Groundwater Management Plan, and will support the sustainable management of the Borrego Springs Groundwater Subbasin.
- **Biological Restoration of Fallowed Lands.** This project is recommended by the Watermaster's Environmental Working Group. The project will develop information to guide the use of "biological restoration" as a technique to mitigate the potential adverse impacts associated with the fallowing of lands that is expected to occur within the Subbasin due to future reductions in groundwater pumping needed to achieve sustainable groundwater management. Reducing the potential for airborne dust emissions and enhancing habitat are the primary objectives of this project.
- **Groundwater Dependent Ecosystems (GDE) Monitoring Program.** This project is also recommended by the Watermaster's Environmental Working Group. This project is designed to determine if the historical GDEs within the Subbasin (particularly the Mesquite Bosque in the Borrego Sink) are dependent on the regional aquifer of the Subbasin, or not. The results of this project could be used to update and improve the Groundwater Management Plan to protect the environmental uses of groundwater in the basin.

These projects will have multiple benefits to the severely disadvantaged and underrepresented community of Borrego Springs:

- The community's water supply is solely dependent on the groundwater basin. These projects will help to ensure that the groundwater basin remains an affordable, high-quality source of water for the community.
- The Watermaster was officially formed in April 2021. Expenses to conduct Watermaster activities are relatively new costs that are ultimately funded by the residents and rate payers within the community. The grant funding will help offset the new costs and provide financial relief to our severely disadvantaged community.
- A primary driver of the economy in Borrego Springs is ecotourism associated with the Anza-Borrego State Park, dark and clear night skies, and the beautiful flora and fauna of the region. These projects will help maintain or enhance the physical and biological environment within the community, and thereby support economic activity within Borrego Springs.

We support the projects described in this letter, and the Watermaster's efforts to achieve sustainable groundwater management in Borrego Springs.

Daniel Wright,

Board President