Coachella Valley Integrated Regional Water Management
2022 Prop 1 Round 2 IRWM Implementation Grant Proposal

Submitted by the Coachella Valley Water District
On behalf of the Regional Water Management Group and the Planning Partners

Grant Application Checklist

APPLICANT INFORMATION TAB		
APPLICANT INFORMATION		
✓	Organization Name	Coachella Valley Water District
✓	Point of Contact	Ivory Reyburn
✓	Division	Environmental Services
✓	Position Title	Water Resources Supervisor
✓	Address	PO Box 1058, Coachella, CA 92236
✓	Email	ireyburn@cvwd.org
✓	Phone number	(760) 398-2661
✓	Funding Area Information	Colorado River Funding Area
✓	Proposal Name	Proposition 1 Round 2 Coachella Valley IRWM Implementation Proposal
✓	Proposal Objective	The Proposition 1 Round 2 Coachella Valley IRWM Implementation Proposal includes six projects, as well as grant administration, implemented by five local project sponsors at a total request of $4,112,755.
✓	Are AB1249 contaminants found in the IRWM region? If so, and no project is included in the proposal to address these contaminants, please provide an explanation of why a project is not included.	Yes, the Proposition 1 Round 2 Coachella Valley IRWM Implementation Proposal includes projects to address AB1249 contaminations. These projects include: Project 3: Groundwater Quality Protection Project – Area D-3 Project 4: Coachella Water Authority (CWA) Groundwater Well Project Project 5: Polanco Septic Rehabilitation Project
✓	Does the proposal contribute to regional self-reliance (reduce reliance on the Sacramento-San Joaquin River Delta)? If region is not reliant on the Delta, please provide an explanation.	Yes, the Proposition 1 Round 2 Coachella Valley IRWM Implementation Proposal contributes to regional self-reliance. Several of the projects improve water use efficiency which reduced demand and contributes to regional self-reliance. These projects include: Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project Project 6: Sunrise Park Recycled Water Connection

✓	Does the proposal address risk from Climate Change? Please identify which specific projects address risk from climate change?	Yes, the Proposition 1 Round 2 Coachella Valley IRWM Implementation Proposal addresses risk from climate change. All six projects address risk from climate change by improving overall water supply reliability, protecting groundwater quality, and offsetting potable water use. See Attachment 6 for more details.
PROPOSAL BUDGET		
✓	Other Contribution	LEAVE BLANK
✓	Local Contribution	LEAVE BLANK
✓	Federal Contribution	LEAVE BLANK
✓	In-kind Contribution	LEAVE BLANK
✓	Amount Requested	$4,112,755
✓	Total Proposal Cost	AUTO-POPULATED
GEOGRAPHIC INFORMATION		
✓	Latitude	33.743930
✓	Longitude	-116.350990
✓	Longitude/Latitude Clarification	The latitude and longitude provided are for the headquarters of Coachella Valley Water District, the project applicant.
✓	Location	LEAVE BLANK
✓	County(ies)	Riverside County
✓	Groundwater Basins	LEAVE BLANK
✓	Hydrologic Regions	LEAVE BLANK
✓	Watersheds	LEAVE BLANK
LEGISLATIVE INFORMATION		
✓	State Assembly District	District 36; District 47
✓	State Senate District	District 19; District 19
✓	U.S. Congressional District	District 25; District 41

PROJECTS TAB	
Project Name *(150 characters)*	Proposition 1 Round 2 Coachella Valley IRWM Implementation Proposal
Implementing Organization	LEAVE BLANK
Secondary Implementing Organization (125 char)	LEAVE BLANK
Proposed Start Date	LEAVE BLANK
Proposed End Date	LEAVE BLANK

Scope of Work	LEAVE BLANK
Project Description	LEAVE BLANK
Project Objective	LEAVE BLANK
PROJECT BENEFITS INFORMATION	
PSP states do not enter any information into GRanTS for the Project Benefits Information for the 'Project' tab.	
BUDGET	
PSP states do not enter any information into GRanTS for the Project Budget for the 'Project' tab. Use the "Copy Budget data from Applicant Info" feature to populate previously entered data. The total project cost will auto calculate.	
GEOGRAPHIC INFORMATION	
Latitude	33.743930
Longitude	-116.350990
County	Riverside
PSP states leave all other fields blank for Geographic Information for the 'Project' tab.	
LEGISLATIVE INFORMATION	
PSP states to use the "Copy Legislative data from Applicant Info" feature to populate previously entered data.	

APPLICANT INFORMATION AND QUESTIONS TAB		
✓	Self-Certification	Yes

PROJECT INFORMATION TAB		
PROJECT 1		
1. PROJECT INFORMATION		
✓	Project Name	Reservoirs 4711-3 and 4711-4 Project
✓	Local Partner Sponsor	Coachella Valley Water District
✓	Provide project map in a pdf format	
✓	Funding Category *(DAC Implementation Project Fund or General Implementation Project Fund)*	General Implementation Project Fund
✓	Project Type	Local & regional surface and underground water storage, including groundwater aquifer
✓	Grant Amount Requested	$850,000
✓	Non-State Cost Share	$3,550,000
✓	Other Cost Share	$0
✓	Cost Share Waiver Requested *(50%, 25%, 12.5%,* or *0%)*	0%
1. GEOGRAPHIC INFORMATION		
✓	Latitude	33.8391
✓	Longitude	-116.2147
✓	County	Riverside
PSP states leave all other fields blank for Geographic Information.		
1. PROPOSAL LEVEL EVALUATION		
✓	If the IRWM region has been identified as an area where contaminants listed in AB 1249 exist, does this project(s) address the contaminant(s)? If yes, describe how the project helps address contaminant	No.
1. PROJECT LEVEL EVALUATION		

✓	Primary Benefit Level	Water Supply
✓	Primary Benefit Unit	Acre Feet Per Year
✓	Secondary Benefit Level	Water Supply Reliability
✓	Secondary Benefit Unit	Acre Feet Per Year
✓	Qualitative benefit *If this is a decision support tool, please describe the qualitative benefit of the project including what decisions will be informed by this tool.*	LEAVE BLANK
✓	Description	The Reservoirs 4711-3 and 4711-4 Project will involve construction of two new 1.0 million gallon (MG) aboveground welded-steel tanks (Reservoirs 4711-3 and 4711-4) and subsequently demolish the existing 100,000-gallon aboveground bolted-steel tanks (Reservoirs 4711-1 and 4711-2), which were originally constructed in 1993 and 1999. The Project will restore and improve water storage infrastructure and ensure reliable and sustainable domestic water supply and fire flow protection to Coachella Valley Water District's (CVWD's) customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills. The tanks will be constructed above grade on CVWD-owned land adjacent to the existing 0.1 MG (each) Reservoirs 4711-1 and 4711-2, thus requiring minimal piping (approximately 200 linear feet of 12-inch diameter DIP piping) to connect to the CVWD domestic water system. The construction of Reservoirs 4711-3 and 4711-4 includes excavation, grading, soil compaction, and construction of two 76-foot diameter by 5-foot deep foundations; construction of two 1.0 MG welded-steel tanks (overflow heights at 30 ft.) equipped with cathodic protection to decrease corrosion; construction of all required aboveground and buried appurtenances (e.g., water meters, valves, 18-inch diameter connection to the existing Dillon Road Transmission Pipeline, etc.); and construction of all required infrastructure (e.g., riprap revetment north/upstream of the new reservoirs, perimeter chain-link fence, etc.). Following the construction and initial operation of proposed Reservoirs 4711-3 and 4711-4, the two existing bolted-steel tanks (Reservoirs 4711-1 and 4711-2) and associated appurtenances and infrastructure will be demolished and removed from the Project site. This demolition will include the removal of existing aboveground meters, valves, and pipelines as well as the existing riprap revetment and perimeter chain-link fence.
✓	Does the project provide physical benefits to more than one IRWM region and/or Funding Area? If yes, describe.	No

✓	If the project addresses AB1249 contaminants, does the project provide safe drinking water to a small disadvantaged community?	No
✓	Does the project employ new or innovative technology or practices? If yes, describe.	No
✓	Does the project provide a benefit(s) to a DAC and/or EDA? *(Yes or no)*	Yes
✓	What percentage of project benefit will go to a DAC and/or EDA?	100%
✓	If the project provides a benefit to a DAC and/or EDA please describe the benefit, the percentage of project benefit and justification for the benefit level, and how the area meets the definitions of a DAC and/or EDA.	The community of Indio Hills in the Reservoirs 4711-3 and 4711-4 Project is a SDAC, with a MHI of $36,810, population of 1,586, and 586 households. The Project will alleviate the water storage deficiency, increase pressure, and improve water quality for the 800 residents of the disadvantaged community of Indio Hills. The project will allow CVWD to continue to provide the Indio Hills DACs a safe, clean, affordable supply of water for human consumption, cooking, and sanitary purposes.
✓	Does the project provide a benefit(s) to a Tribe? *(Yes or no)*	No
✓	What percentage of the project benefit will go to a Tribe?	N/A
✓	If the project provides a benefit to a Tribe please include the name of the Tribe, the percentage of project benefits directly benefitting the Tribe, and justification for the benefit level.	N/A

PROJECT 2		
2. PROJECT INFORMATION		
✓	Project Name	Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project
✓	Local Partner Sponsor	Desert Water Agency
✓	Provide project map in a pdf format	
✓	Funding Category *(DAC Implementation Project Fund or General Implementation Project Fund)*	General Implementation Project Fund
✓	Project Type	Water-use efficiency and water conservation
✓	Grant Amount Requested	$812,755
✓	Non-State Cost Share	$812,755
✓	Other Cost Share	$0
✓	Cost Share Waiver Requested *(50%, 25%, 12.5%,* or *0%)*	0%
2. GEOGRAPHIC INFORMATION		
✓	Latitude	33.77817
✓	Longitude	-116.37545
✓	County	Riverside
PSP states leave all other fields blank for Geographic Information.		
2. PROPOSAL LEVEL EVALUATION		
✓	If the IRWM region has been identified as an area where contaminants listed in AB 1249 exist, does this project(s) address the contaminant(s)? If yes, describe how the project helps address contaminant	No
2. PROJECT LEVEL EVALUATION		
✓	Primary Benefit Level	Water Conservation
✓	Primary Benefit Unit	Acre Feet Per Year

✓	Secondary Benefit Level	Reduced Groundwater Pumping
✓	Secondary Benefit Unit	Acre Feet Per Year
✓	Qualitative benefit *If this is a decision support tool, please describe the qualitative benefit of the project including what decisions will be informed by this tool.*	The Regional Conservation Study component is a decision support tool that will guide the agencies as they work to determine incentive amounts and water supply impacts. The Study will: • Quantify grass replacement program water savings that account for local conditions and practices (local evapotranspiration (ET), soil types, irrigation efficiency); • Quantify the cost per acre-foot for turf replacement and the return on investment for agencies and program participants; • Develop data on the rate at which turf replacement participants return to turf after installing a low-water-use landscape; • Quantify the amount of turf remaining in the Coachella Valley available for future conversions; • Explore technologies that could better assist in monitoring of the items above; and • Consider other variables that may inform water conservation program development

✓	Description	The Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project includes multiple project components that are all implemented under the regional program. The Turf Removal Program is a multifaceted program that will make turf rebates available throughout the CVRWMG's collective service area for a variety of water customers, including residential, multi-family, commercial and municipal sites. This program will assist the Region's water purveyors in effectively managing groundwater by reducing demands and groundwater pumping. The Turf Removal Program extends a grant-funded program that was established in 2014 to reduce water use in the Valley. The CVRWMG is also currently implementing a DAC focused rebate program, which will provide information on how best to target DAC populations for this program. The CVRWMG agencies are requesting funding to offset costs for the removal of turf for their customers to reduce outdoor water demand. By removing turf, customers will use less water to irrigate, and groundwater pumping can be reduced. The Regional Conservation Study developed would be a decision support tool that helps the agencies to better understand the impact of water conservation programs in the Valley. The Study will quantify grass replacement program water savings, along with the cost per acre-foot for turf replacement and the return on investment for agencies and program participants. The Study will develop data on the rate at which turf replacement participants return to turf after installing a low-water-use landscape and quantify the amount of turf remaining in the Coachella Valley available for future conversions. This study will help improve water conservation program investments in the Valley and other desert communities. The Mission Springs Water District (MSWD) Demonstration Garden will display the most water efficient irrigation systems, various ground covers and will provide examples of maintaining challenging slopes and microclimates. as the garden will encourage the selection of current desert friendly varieties of plant material reflecting the most recent edition of MSWD's *Water Efficient Landscaping Guidelines* and Water-Wise Plant Guide. The centrally located gardens will provide an excellent educational space for self-guided and group tours. The potential design will provide an area for educational workshops to provide real time demonstrations of topics such as pruning, vegetable gardening, selecting desert plants, and irrigation zones. The incorporation of technology is proposed into the garden via a web/phone application interface that will allow visitors to be able to look up in real time plant species, rock types, and irrigation elements by simply downloading the application and scanning an identification marker. The demonstration garden will educate the public on efficient outdoor water use, and visitors can apply efficient garden design in their own yards, thereby reducing water demands. Information will also be available in Spanish.
✓	Does the project provide physical benefits to more than one IRWM region and/or Funding Area? If yes, describe.	No

✓	If the project addresses AB1249 contaminants, does the project provide safe drinking water to a small disadvantaged community?	N/A
✓	Does the project employ new or innovative technology or practices? If yes, describe.	This project furthers the statewide goal of preparing for and managing through dry periods since grass removal reduces the amount of water needed to sustain plant life during a drought. Additionally, the Regional Conservation Study is a decision support tool that will allow water managers to make better decisions about investments in future grass removal programs. The Demonstration Garden will showcase the latest in outdoor irrigation technology.
✓	Does the project provide a benefit(s) to a DAC and/or EDA? *(Yes or no)*	Yes
✓	What percentage of project benefit will go to a DAC and/or EDA?	50%
✓	If the project provides a benefit to a DAC and/or EDA please describe the benefit, the percentage of project benefit and justification for the benefit level, and how the area meets the definitions of a DAC and/or EDA.	The Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project will serve the service areas of the CVRWMG agencies, which include CVWD, Indio Water Authority (IWA), MSWD, DWA, and CWA. Overall, the project will address the challenges DACs face, such as water affordability and water supply reliability. The first component of the project, Regional Grass Replacement Program, will directly benefit DACs by reducing potable water demands through water-efficient landscaping. While the second component of the project, Regional Conservation Study, does not directly benefit DACs, CVRWMG agencies will use the decision support tool to evaluate the water savings and cost-effectiveness of the grass removal saving, which may result in more conservation programs that benefit DACs. For the Regional Turf Program, each of the CVRWMG agencies has DACs within their service area. DAC residents that apply for the incentive program will be directly benefited. Per DWR's DAC Mapping Tool, multiple portions of the service area of the CVRWMG agencies overlap census tracts, census places, and census block groups. Water savings provided by the project directly translate into cost savings to DACs by reducing water bills, and indirectly benefits DACs through reduced water rate increases and improved water supply reliability due to decreased demand for groundwater.
✓	Does the project provide a benefit(s) to a Tribe? *(Yes or no)*	No
✓	What percentage of the project benefit will go to a Tribe?	N/A

✓	If the project provides a benefit to a Tribe please include the name of the Tribe, the percentage of project benefits directly benefitting the Tribe, and justification for the benefit level.	N/A
PROJECT 3		
3. PROJECT INFORMATION		
✓	Project Name	Groundwater Quality Protection Project – Area D-3
✓	Local Partner Sponsor	Mission Springs Water District
✓	Provide project map in a pdf format	
✓	Funding Category *(DAC Implementation Project Fund or General Implementation Project Fund)*	General Implementation Project Fund
✓	Project Type	Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff
✓	Grant Amount Requested	$875,000
✓	Non-State Cost Share	$875,000
✓	Other Cost Share	$245,000
✓	Cost Share Waiver Requested *(50%, 25%, 12.5%,* or *0%)*	0%
3. GEOGRAPHIC INFORMATION		
✓	Latitude	33.97403
✓	Longitude	-116.50332
✓	County	Riverside
PSP states leave all other fields blank for Geographic Information.		
3. PROPOSAL LEVEL EVALUATION		

✓	If the IRWM region has been identified as an area where contaminants listed in AB 1249 exist, does this project(s) address the contaminant(s)? If yes, describe how the project helps address contaminant	Yes, the Groundwater Quality Protection Project – Area D-3 abates septic tanks that negatively impact groundwater sources, primarily from nitrate contamination, and connects parcels to the wastewater collection and treatment system. The project will protect the beneficial uses of the Mission Creek and Desert Hot Springs Subbasins as set forth in the Colorado River Basin Regional Water Quality Control Board Basin Plan.
3. PROJECT LEVEL EVALUATION		
✓	Primary Benefit Level	Groundwater Quality
✓	Primary Benefit Unit	Acre feet per year
✓	Secondary Benefit Level	Water Supply
✓	Secondary Benefit Unit	Acre feet per year
✓	Qualitative benefit *If this is a decision support tool, please describe the qualitative benefit of the project including what decisions will be informed by this tool.*	LEAVE BLANK
✓	Description	The Groundwater Quality Protection Program - Area D-3 is part of Assessment District 18, approved by voters in December 2019, intended to continue MSWD successful history of converting areas from an on-site septic disposal system to the public sewer collection and treatment system. Assessment District 18 provides match funding to complete these improvements. This application focuses on Area D-3 and its construction to connect 102 parcels to the MSWD sewer collection and treatment system and abate 81 on-site septic disposal systems. Engineering design and CEQA for Area D-3 were previously completed in 2015 and only require a review and update for bidding. This project will protect both the drinking water supplies and the hot water that is the basis of the spa economy for the City of Desert Hot Springs and the Coachella Valley. The Project will capture untreated septic flows currently lost to the Desert Hot Springs Sub-Basin, and, after treatment, will be recharged back into the Mission Creek Sub-Basin helping reduce and manage basin overdraft, and provide groundwater sustainability. The project construction consists of approximately 4,900 linear feet of 8-inch VCP sewer mainline, 3,500 linear feet of 4-inch VCP sewer laterals, 17 4-foot diameter manholes, 20,000-square feet of pavement/trench repair, and associated improvements.

✓	Does the project provide physical benefits to more than one IRWM region and/or Funding Area? If yes, describe.	No
✓	If the project addresses AB1249 contaminants, does the project provide safe drinking water to a small disadvantaged community?	The project abates septic tanks that negatively impact groundwater sources, primarily from nitrate contamination, and connects parcels to the wastewater collection and treatment system. The project will protect the beneficial uses of the Mission Creek and Desert Hot Springs Subbasins as set forth in the Colorado River Basin Regional Water Quality Control Board Basin Plan. 100% of the project area is classified as a DAC.
✓	Does the project employ new or innovative technology or practices? If yes, describe.	No
✓	Does the project provide a benefit(s) to a DAC and/or EDA? *(Yes or no)*	Yes
✓	What percentage of project benefit will go to a DAC and/or EDA?	100%
✓	If the project provides a benefit to a DAC and/or EDA please describe the benefit, the percentage of project benefit and justification for the benefit level, and how the area meets the definitions of a DAC and/or EDA.	The community served by the project area has a MHI of $37,818. The project will protect groundwater from untreated septic flows by abating 81 septic systems and ensuring future infill development of the 21 vacant lots immediately connect to the wastewater collection and treatment system. The local disadvantaged community stakeholders have shown their interest and support for the Groundwater Quality Protection Program through their approval of the Assessment District 18, which provides match funding to complete the proposed sewer improvements. The Assessment District 18 approval process required close to 12 months of public outreach, including several mailers about the program, several public/community meetings, phone calls, etc. Following said outreach, all residents within the assessment district area were sent a mail-in voting ballot to either approve or reject the proposed assessment district. A majority of the residents voted to approve the assessment district. This solidified the stakeholders continued support of the Groundwater Quality Protection Program (i.e. septic to sewer program). In addition, MSWD continues to hold regular community meetings to provide stakeholders an update on the status of the assessment district, including the status of design and construction of the various approved septic to sewer areas, the status of grant funding, and to answer questions.
✓	Does the project provide a benefit(s) to a Tribe? *(Yes or no)*	No

✓	What percentage of the project benefit will go to a Tribe?	N/A
✓	If the project provides a benefit to a Tribe please include the name of the Tribe, the percentage of project benefits directly benefitting the Tribe, and justification for the benefit level.	N/A
PROJECT 4		
4. PROJECT INFORMATION		
✓	Project Name	Coachella Water Authority (CWA) Groundwater Well Project
✓	Local Partner Sponsor	Coachella Water Authority
✓	Provide project map in a pdf format	
✓	Funding Category *(DAC Implementation Project Fund or General Implementation Project Fund)*	DAC Implementation Project Fund
✓	Project Type	Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff
✓	Grant Amount Requested	$750,000
✓	Non-State Cost Share	$0
✓	Other Cost Share	$3,145,291
✓	Cost Share Waiver Requested *(50%, 25%, 12.5%,* or *0%)*	50%
4. GEOGRAPHIC INFORMATION		
✓	Latitude	33.673234
✓	Longitude	-116.198721
✓	County	Riverside
PSP states leave all other fields blank for Geographic Information.		
4. PROPOSAL LEVEL EVALUATION		

✓	If the IRWM region has been identified as an area where contaminants listed in AB 1249 exist, does this project(s) address the contaminant(s)? If yes, describe how the project helps address contaminant	Yes. There are small water systems (SWSs) that rely on unreliable private groundwater wells that sometimes do not meet drinking water quality standards for the contaminations listed in AB 1249. CWA is in the process of consolidating SWSs that rely on individual, private groundwater well into its potable water system. In the next year, CWA will consolidate three SWSs that have experienced poor water quality, poor water supply reliability, and lack of redundancy (Shady Lane Mobile Home Park (MHP), Mesquite Mutual Water Company, and Castro Trailer Park). CWA will implement the CWA Groundwater Well Project in order to reliably serve these SWSs and CWA's existing customers.
4. PROJECT LEVEL EVALUATION		
✓	Primary Benefit Level	Water Supply
✓	Primary Benefit Unit	Acre Feet Per Year
✓	Secondary Benefit Level	Water Quality
✓	Secondary Benefit Unit	Acre Feet Per Year
✓	Qualitative benefit *If this is a decision support tool, please describe the qualitative benefit of the project including what decisions will be informed by this tool.*	LEAVE BLANK
✓	Description	CWA is a joint powers authority formed by the City of Coachella and Coachella Redevelopment Agency to provide potable water service to the City of Coachella and surrounding areas. CWA's water supply consists solely of groundwater, which is pumped from six wells within the Indio Subbasin of the Coachella Valley Groundwater Basin. To ensure safe, clean drinking water for residents within its service area, CWA is in the process of consolidating SWSs that rely on individual, private groundwater wells into its potable water system. These SWSs often have poor water quality, poor water supply reliability, lack redundancy, and are small, DACs. In the next year, CWA is planning to consolidate Shady Lane MHP, Mesquite Mutual Water Company, and Castro's Mobile Home Community. All three SWSs previously relied on private, on-site wells to provide domestic water to a total of approximately 102 residential connections, as well as irrigation services. However, all three private wells exceeded the maximum contaminant level for the hexavalent chromium drinking water standard and have failed in the past six years leaving the residents with no water supply. Temporary emergency water supplies have since been provided by CWA and adjacent parcels; for example, two of these SWS are currently being served by a high line from nearby CWA fire hydrants. As the lack of dedicated water supplies and lack of redundancy put the residents of each of the SWSs at risk, consolidation into CWA's water system was found to be the most feasible and long-lasting alternative.

✓	Does the project provide physical benefits to more than one IRWM region and/or Funding Area? If yes, describe.	No
✓	If the project addresses AB1249 contaminants, does the project provide safe drinking water to a small disadvantaged community?	SWSs that rely on unreliable private groundwater wells that sometimes do not meet drinking water quality standards for the contaminations listed in AB 1249. CWA is in the process of consolidating SWSs that rely on individual, private groundwater well into its potable water system. CWA is consolidating Shady Lane MHP, Mesquite Mutual Water Company, and Castro Trailer Park to their municipal system. CWA is need of a new groundwater well to increase overall capacity to serve these systems. Per DWR's DAC Mapping Tool, 93% of CWA's service area is within a DAC or SDAC.
✓	Does the project employ new or innovative technology or practices? If yes, describe.	No
✓	Does the project provide a benefit(s) to a DAC and/or EDA? *(Yes or no)*	Yes
✓	What percentage of project benefit will go to a DAC and/or EDA?	93%
✓	If the project provides a benefit to a DAC and/or EDA please describe the benefit, the percentage of project benefit and justification for the benefit level, and how the area meets the definitions of a DAC and/or EDA.	This project will benefit SWSs in CWA's service area. Per DWR's DAC Mapping Tool, the majority of CWA's service area overlaps with a DAC or SDAC. CWA's plan to consolidate three small water systems experiencing poor water quality and reliability as well as lack of redundancy depends on CWA building a new groundwater wall to increase overall capacity.
✓	Does the project provide a benefit(s) to a Tribe? *(Yes or no)*	No
✓	What percentage of the project benefit will go to a Tribe?	N/A

✓	If the project provides a benefit to a Tribe please include the name of the Tribe, the percentage of project benefits directly benefitting the Tribe, and justification for the benefit level.	N/A
PROJECT 5		
5. PROJECT INFORMATION		
✓	Project Name	Polanco Septic Rehabilitation Program
✓	Local Partner Sponsor	Pueblo Unido Community Development Corporation (PUCDC)
✓	Provide project map in a pdf format	
✓	Funding Category *(DAC Implementation Project Fund or General Implementation Project Fund)*	DAC Implementation Project Fund
✓	Project Type	Improvement of water quality, including drinking water treatment and distribution, groundwater and aquifer remediation, matching water quality to water use, wastewater treatment, water pollution prevention, and management of urban and agricultural runoff
✓	Grant Amount Requested	$300,000
✓	Non-State Cost Share	$0
✓	Other Cost Share	$0
✓	Cost Share Waiver Requested *(50%, 25%, 12.5%,* or *0%)*	50%
5. GEOGRAPHIC INFORMATION		
✓	Latitude	33.46675
✓	Longitude	-116.10290
✓	County	Riverside
PSP states leave all other fields blank for Geographic Information.		
5. PROPOSAL LEVEL EVALUATION		

✓	If the IRWM region has been identified as an area where contaminants listed in AB 1249 exist, does this project(s) address the contaminant(s)? If yes, describe how the project helps address contaminant	Yes. Aging or failing septic systems that result in surfacing wastewater have been cited as a serious public health concern and a potential source of water quality constituents such as bacteria and nitrates in the groundwater and surface water. The Polanco Septic Rehabilitation Program will protect against nitrate contamination through rehabilitation of septic systems at small MHPs in the Eastern Coachella Valley.
5. PROJECT LEVEL EVALUATION		
✓	Primary Benefit Level	Groundwater Quality
✓	Primary Benefit Unit	Acres
✓	Secondary Benefit Level	Water Quality
✓	Secondary Benefit Unit	Acre Feet Per Year
✓	Qualitative benefit *If this is a decision support tool, please describe the qualitative benefit of the project including what decisions will be informed by this tool.*	LEAVE BLANK
✓	Description	The Polanco Septic Rehabilitation Program includes the installation of 10 new septic systems to 2 Polanco MHPs. The East Valley area in which these 2 MHPs are located is within a 100% DAC area per DWR DAC mapping. It is estimated that the project will reduce approximately 2.5 tons per year of TSS to groundwater and local surface waters. Surfacing wastewater due to septic failure results in a potential public health threat due to the potential for direct human contact with inadequately treated sewage. Inadequately treated septic flows to groundwater can result in contaminated drinking water, as many residents in this DAC area still rely on shallow groundwater for drinking. Surfacing flows can also lead to runoff of bacteria and solids directly into the local waterways and ultimately to the Salton Sea, which is a source of recreation in the Coachella Valley. PUCDC will work with farmworker families to explain the onsite improvement process from the different aspects of project development. This includes information on best practices for onsite water supply and onsite waste management. PUCDC will also coordinate work with local consultants including retaining services for civil, and geotechnical engineering for the septic design, and soils reports. As well with initiating coordination with the local permit agencies to obtain required permits. PUCDC will coordinate obtaining bids from general contractors and vendors and oversee construction of septic systems. This includes coordination of final inspections with local government agencies.

✓	Does the project provide physical benefits to more than one IRWM region and/or Funding Area? If yes, describe.	No
✓	If the project addresses AB1249 contaminants, does the project provide safe drinking water to a small disadvantaged community?	The Eastern Coachella Valley area in which these two MHPs are located is within a DAC or SDAC per DWR DAC Mapping Tool. Rehabilitation of these septic systems will reduce nitrate contamination to both shallow groundwater and to local surface waters.
✓	Does the project employ new or innovative technology or practices? If yes, describe.	No
✓	Does the project provide a benefit(s) to a DAC and/or EDA? *(Yes or no)*	Yes
✓	What percentage of project benefit will go to a DAC and/or EDA?	100%
✓	If the project provides a benefit to a DAC and/or EDA please describe the benefit, the percentage of project benefit and justification for the benefit level, and how the area meets the definitions of a DAC and/or EDA.	The Eastern Coachella Valley area in which these two MHPs are located is within a DAC or SDAC per DWR DAC Mapping Tool. Rehabilitation of these septic systems will reduce pollution loading of solids and bacteria, specifically nitrate, to both shallow groundwater and to local surface waters. Surfacing wastewater due to septic failure results in a potential public health threat due to the potential for direct human contact with inadequately treated sewage. Inadequately treated septic flows to groundwater can result in contaminated drinking water, as many residents in this DAC area still rely on shallow groundwater for drinking. Surfacing flows can also lead to runoff of bacteria and solids directly into the local waterways and ultimately to the Salton Sea, which is a source of recreation in the valley.
✓	Does the project provide a benefit(s) to a Tribe? *(Yes or no)*	No
✓	What percentage of the project benefit will go to a Tribe?	N/A

✓	If the project provides a benefit to a Tribe please include the name of the Tribe, the percentage of project benefits directly benefitting the Tribe, and justification for the benefit level.	N/A
PROJECT 6		
6. PROJECT INFORMATION		
✓	Project Name	Sunrise Park Recycled Water Connection
✓	Local Partner Sponsor	Desert Water Agency
✓	Provide project map in a pdf format	
✓	Funding Category *(DAC Implementation Project Fund or General Implementation Project Fund)*	General Implementation Project Fund
✓	Project Type	Water reuse & recycling for non-potable reuse and direct and indirect potable reuse
✓	Grant Amount Requested	$500,000
✓	Non-State Cost Share	$500,000
✓	Other Cost Share	$41,000
✓	Cost Share Waiver Requested *(50%, 25%, 12.5%,* or *0%)*	N/A
6. GEOGRAPHIC INFORMATION		
✓	Latitude	33.81707
✓	Longitude	-116.52625
✓	County	Riverside
PSP states leave all other fields blank for Geographic Information.		
6. PROPOSAL LEVEL EVALUATION		

✓	If the IRWM region has been identified as an area where contaminants listed in AB 1249 exist, does this project(s) address the contaminant(s)? If yes, describe how the project helps address contaminant	No
6. PROJECT LEVEL EVALUATION		
✓	Primary Benefit Level	Water Supply – Recycled Water
✓	Primary Benefit Unit	Acre Feet Per Year
✓	Secondary Benefit Level	Reduced groundwater pumping
✓	Secondary Benefit Unit	Acre Feet Per Year
✓	Qualitative benefit	LEAVE BLANK
✓	Description *If this is a decision support tool, please describe the qualitative benefit of the project including what decisions will be informed by this tool.*	This project would extend Desert Water Agency's recycled water pipe system to serve irrigation needs at Sunrise Park with roughly 1,000,000 square feet of grass. This project includes the addition of a booster station, 4,000 lineal feet of 8-inch recycled water pipe and some onsite connection retrofits for 11 services. The capacity at the existing water recycling plant is sufficient to handle the additional demand, so no upgrades are necessary at that facility as a result of this project.
✓	Does the project provide physical benefits to more than one IRWM region and/or Funding Area? If yes, describe.	No
✓	If the project addresses AB1249 contaminants, does the project provide safe drinking water to a small disadvantaged community?	N/A
✓	Does the project employ new or innovative technology or practices? If yes, describe.	No

✓	Does the project provide a benefit(s) to a DAC and/or EDA? *(Yes or no)*	Yes
✓	What percentage of project benefit will go to a DAC and/or EDA?	50%
✓	If the project provides a benefit to a DAC and/or EDA please describe the benefit, the percentage of project benefit and justification for the benefit level, and how the area meets the definitions of a DAC and/or EDA.	DAC residents rely more heavily on community resources like public parks for recreation. Sunrise Park is home to the Boys & Girls Club of Palm Springs and the Mizell Center. The Boys & Girls Club of Palm Springs is a nonprofit organization, providing a wide range of after school, summer, and winter programs in a safe and supervised environment for over 1,700 children. The Mizell Center is a non-denominational organization that has been serving the senior community in the greater Palm Springs area since 1974. By serving the irrigation needs of the park, the project is ensuring that DACs have access to urban green spaces.
✓	Does the project provide a benefit(s) to a Tribe?	No
✓	What percentage of the project benefit will go to a Tribe? *(Yes or no)*	No
✓	If the project provides a benefit to a Tribe please include the name of the Tribe, the percentage of project benefits directly benefitting the Tribe, and justification for the benefit level.	N/A

PROPOSAL ATTACHMENTS TAB		
✓	Attachment 1: Authorization and Eligibility Requirements	Att1_P1R2IG _Eligible_#ofTotal#
✓	Attachment 2: Work Plan	Att2_P1R2IG _WorkPlan_#ofTotal#
✓	Attachment 3: Budget	Att3_P1R2IG _Budget_#ofTotal#
✓	Attachment 4: Schedule	Att4_P1R2IG _Schedule_#ofTotal#

✓	Attachment 5: DAC/EDA	Att5_P1R2IG _DAC_#ofTotal#
✓	Attachment 6: Climate Change	Att6_P1R2IG _Climate_#ofTotal#
✓	Attachment 7: Review Process	Att7_P1R2IG _Review_#ofTotal#

Eligibility Criteria Self-Certification Form

As an applicant with the Department of Water Resources' (DWRs) Financial Assistance Branch, you must complete this self-certification form as a condition to enter into a Grant Agreement with DWR to receive grant funds. A single form should be completed for the Grantee and all Local Project Sponsors. Failure to meet and continue to comply with these conditions and requirements may result in DWR revoking the grant award, withholding grant funding, stopping invoice payment, and/or terminating the Grant Agreement. An answer of "No" to certain questions below may make you ineligible to enter into an agreement with DWR. If any question is going to be answered as "No" please contact DWR at dwr_irwm@water.ca.gov.

1. Applicant Eligibility

Applicant Name: Coachella Valley Water District
Applicant Entity Type: Public Agency

Applicant/Local Project Sponsor Name	Applicant/Local Project Sponsor Entity Type (public agency, mutual water company, etc)
Applicant: Coachella Valley Water District	Public Agency
LPS: Mission Springs Water District	Public Agency
LPS: Coachella Water Authority	Public Agency
LPS: Pueblo Unido Community Development Corporation	Non-governmental organization
LPS: Desert Water Agency	Public Agency

If the Applicant or any Local Project Sponsor is a mutual water company or public utility, does their proposed project have a clear and definite public purpose that benefits the customers of the water system or other public utility and not the investors?
Yes ☒ No ☐ N/A ☐

If yes, please state the public purpose and explain how it benefits the customers:
Coachella Valley Water District is a public utility submitting the Reservoirs 4711-3 and 4711-4 Project. This project directly benefits customers who receive domestic water supply in unincorporated community of Indio Hills by improving water storage infrastructure to ensure reliable domestic water supply and fire flow protection. The Project will replace the undersized, deteriorated reservoirs with new 1.0 MG reservoirs that will alleviate water storage deficiency, increase pressure, and improve water quality for approximately 900 residents of the disadvantaged community of Indio Hills.

2. Authorizing Resolution

A resolution adopted by the applicant's governing body authorizing the application for a grant under this program that designates a representative to sign the application, and in the event of an award of grant funds, a representative to execute the funding agreement and all necessary documentation (e.g., invoices, progress reports, etc.) is required. A signed, certified resolution must be received prior to the execution of a grant agreement with the State.

Is the authorizing resolution complete and included with the application? If there is not a resolution included at time of application, please provide an estimate for when it will be complete.

The Coachella Valley Water District authorizing resolution was adopted on July 26, 2022, and is included in the application.

3. Are all proposed projects including in an adopted plan that meets 2016 IRWM standards?

Yes ☒ No ☐

4. Have the local project sponsors (LPS) adopted an IRWM plan that meets 2016 IRWM Plan Standards to DWR for review prior to application submittal?

LPS	Date IRWM Plan adopted
Applicant: Coachella Valley Water District	April 23, 2019
LPS: Mission Springs Water District	May 20, 2019
LPS: Coachella Water Authority	September 25, 2019
LPS: Pueblo Unido Community Development Corporation	Pueblo Unido is an NGO and not required to adopt the IRWM Plan
LPS: Desert Water Agency	May 21, 2019

5. Does the proposal meet the purpose of Proposition 1?

Yes ☒ No ☐

6. If applicable, does the project have a useful life consistent with Government Code 16727?

Project Title	Useful Life
Reservoirs 4711-3 and 4711-4 Project	50 years
Regional Grass Replacement Program, Mission Springs Demonstration Garden, and Regional Conservation Study Project	20 years
Groundwater Quality Protection – Area D-3 Project	50 years

Coachella Water Authority Groundwater Well Project	50 years
Polanco Septic Rehabilitation Program	40 years
Sunrise Park Recycled Water Connection	100 years

7. Urban Water Management Compliance

List the urban water suppliers (UWS), as defined by Water Code section 10617, that will receive funding if the application is awarded funds. Does each UWS have a current Urban Water Management Plan (UWMP) verified by DWR that addresses the requirements of the California Water Code? Each UWS must also have a complete and validated water loss audit report verified by DWR in accordance with Senate Bill (SB) No. 555 (Stats. 2015, ch. 679). Additionally, each UWS proposing wastewater projects, water use efficiency projects, or drinking water projects must be compliant with the water metering requirements contained in Water Code section 525 et seq. If the Urban Water Supplier has submitted a 2020 UWMP but has not yet received verification, please indicate the submittal date in place of the verification date with a note.

Urban Water Supplier	Date UWMP verified by DWR
Applicant: Coachella Valley Water District	2020 UWMP submitted 7/01/21, verification from DWR 5/17/2022
LPS: Mission Springs Water District	2020 UWMP submitted 7/01/21, verification from DWR 5/17/2022
LPS: Coachella Water Authority	2020 UWMP submitted 7/01/21, verification from DWR 5/17/2022
LPS: Desert Water Agency	2020 UWMP submitted 7/01/21, verification from DWR 5/17/2022

Are all Urban Water Suppliers compliant with all requirements for Urban Water Suppliers including but not limited to metering requirements (Water Code, § 525 et seq.), water loss audits, and monthly reporting to the State Water Resources Control Board (SWRCB)?
Yes ☒ No ☐

If a supplier isn't compliant with the requirements, please explain:

8. Agricultural Water Management and Measurement Compliance

List the agricultural water suppliers, as defined by Water Code section 10608.12(a), that will receive funding if the application is awarded funds. If there are none, please indicate so. Each supplier must have a completed Agricultural Water Management Plan (AWMP) that has been verified by DWR. If the supplier provides less than 25,000 irrigated acres, they will be exempt from the AWMP requirement.

Agricultural Water Supplier	Date AWMP verified by DWR, or exempt
Applicant: Coachella Valley Water District	Exempt, however CVWD has a Colorado River Water Agricultural Conservation Plan, last updated and submitted to USBR in 2021
N/A to all other LPS	

Are all Agricultural Water Suppliers compliant with all other requirements of an Agricultural Water Supplier including but not limited to farm gate delivery reports, Efficient Water Management Practices, Water Measurement regulations, etc.?

Yes ☒ No ☐

If a supplier isn't compliant with the requirements, please explain:

9. Surface Water Diverter Compliance

List the surface water diverters that will receive funding if the application is awarded funds. If there are none, please indicate so. For the listed surface water diverters, state whether each diverter has submitted their latest annual and monthly surface water diversion reports in compliance with requirements outlined in Water Code section 5100 et seq., and their Use Reports as set forth in the California Code of Regulations, title 23, section 907 et seq., to the SWRCB.

Surface Water Diverter	Has Surface Water Diverter submitted all required reports to SWRCB to remain up to date? (Yes/No)
Coachella Valley Water District	Yes
Desert Water Agency	Yes
N/A to all other LPS	

10. Groundwater Management Compliance

List any projects that directly affect groundwater levels or quality. Please include a GSA support letter for any projects that directly affect groundwater in high or medium priority basins.

You can find your groundwater basin and the priority by going to the following link: https://sgma.water.ca.gov/webgis/?appid=SGMADataViewer#gwlevels%C2%A0

Project Name	Grantee/Local Project Sponsor	Groundwater Basin	Priority of the basin
Reservoirs 4711-3 and 4711-4 Project	Coachella Valley Water District	Coachella Valley Desert Hot Springs	Very Low
Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project	Desert Water Agency	Coachella Valley – Indio	Medium
Groundwater Quality Protection Project – Area D-3	Mission Springs Water District	Coachella Valley – Desert Hot Springs	Very Low
Coachella Water Authority Groundwater Well Project	Coachella Water Authority	Coachella Valley – Indio	Medium
Polanco Rehabilitation Program	Pueblo Unido Community Development Corporation	Coachella Valley – Indio	Medium
Sunrise Park Recycled Water Connection	Desert Water Agency	Coachella Valley – Indio	Medium

11. Groundwater Management Compliance Self-Certification

Groundwater Management Compliance: The Applicant and any Local Project Sponsors must maintain continuing eligibility with the current Sustainable Groundwater Management Act (SGMA, Water Code, § 10720 et seq.) requirements as they come into effect. Please note this applies to all applicants and not just those in a medium or high priority basin.

☒ Yes, the Applicant and Local Project Sponsors agree to maintain continuing eligibility with the most current SGMA requirements, as applicable.
☐ No, the Applicant and Local Project Sponsors do not agree to maintain continuing eligibility with the most current SGMA requirements, as applicable. DWR cannot enter into a Grant Agreement.

12. California Statewide Groundwater Elevation Monitoring (CASGEM) Compliance

Please fill out the following table for any projects located in a high or medium priority groundwater basin as identified by the CASGEM program. Projects in high and medium priority groundwater basins that do not have a CASGEM monitoring entity will not be eligible for funding if the grant applicant and Local Project Sponsor are listed as potential monitoring entities in Water Code section 10927. The same applies to counties whose jurisdictions include unmonitored high and medium priority groundwater basins (Water Code, § 10933.7(a)).

Project	Basin Monitoring Entity	If there is no monitoring entity, is the Local Project Sponsor is an eligible monitoring entity per Water Code section 10928?
Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project	Coachella Valley Water District	N/A
Coachella Water Authority Groundwater Well Project	City of Coachella – Utilities Department	N/A
Polanco Septic Rehabilitation Program	Coachella Valley Water District	N/A
Sunrise Park Recycled Water Connection	Desert Water Agency	N/A

13. Stormwater Projects

If a project is a stormwater and/or dry weather runoff capture project, is it included in a Stormwater Resource Plan or functionally equivalent plan (FEP) if applicable? Projects that benefit a DAC with a population of 20,000 or less are exempt from this requirement. However, they must not be a co-permittee for a municipal separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) permit issued to a municipality with a population greater than 20,000 (Water Code, § 10563(c)(2)(B)).

Project (only list stormwater and/or dry weather runoff capture projects)	**Project Included in a Stormwater Resource Plan or FEP?**
N/A – no projects are stormwater projects.	

14. Agreement Template

Have you and your counsel reviewed the agreement template and all terms and conditions?

Yes ☒ No ☐

I understand that the Department of Water Resources will rely on this signed certification in order to approve funding and that false and/or inaccurate representations in this Self-Certification may result in revocation of the award of funds or loss of all funds awarded to the Grantee. and that reimbursement of any grant funds is reliant upon the Grantee and all local project sponsors to meet and maintain all eligibility requirements outlined within this Self-Certification form, the 2022 Proposition 1 IRWM Implementation Round 2 Program Guideline and Proposal Solicitation Package, and the Grant Agreement terms and conditions. Additionally, for the aforementioned reasons, the Department of Water Resources may withhold disbursement of grant funds and/or pursue any other applicable legal remedies.

J.M. Barrett

Name of Authorized Representative

Signature

General Manager

Title

8·09·2022

Date

Attachment **1**

Coachella Valley Integrated Regional Water Management

2022 IRWM Implementation Grant Proposal

Authorization and Eligibility Requirements – Authorizing Documentation

Attachment 1 consists of the following items:

- ✓ **Authorization and Eligibility Requirements.** This attachment explains how the applicant, projects, and project proponents included within this Proposal meet the authorizing documentation and eligible applicant requirements set by the California Department of Water Resources (DWR) in the *Proposal Solicitation Package for the 2022 Implementation Grant Solicitation (2022 PSP)*. The attachment is comprised of nine separate sections, each of which correspond to the applicable authorization and eligibility requirements described in the *2022 PSP*:
    - 1-1. Authorizing Resolution
    - 1-2. Eligible Applicant Documentation
    - 1-3. IRWM Plan and Project Eligibility
    - 1-4. Urban Water Management Compliance, including:
        - 2020 Urban Water Management Plan (UWMP) Verification letters from DWR (as applicable)
        - Water Loss Audit Report (as applicable)
        - Water Meter (as applicable)
        - Water Conservation and Production Reporting (as applicable)
    - 1-5. Agricultural Water Management and Measurement Compliance (as applicable)
    - 1-6. Surface Water Diverter Compliance (as applicable)
    - 1-7. Groundwater Management Compliance (as applicable)
    - 1-9. CASGEM Compliance
    - 1-10. Stormwater Management Plan Compliance (as applicable)

Authorizing Resolution

Resolution 2022-33 was adopted by the Coachella Valley Water District (CVWD) Board of Directors on July 26, 2022 and authorizes CVWD to submit this *2022 IRWM Implementation Grant Proposal* and execute an agreement with the State of California for implementation of six priority water resources projects and grant administration (see **Appendix 1-1**).

Eligible Applicant Documentation

This *2022 IRWM Implementation Grant Proposal* is being submitted by Coachella Valley Water District (CVWD). CVWD is an eligible applicant in accordance with the *2019 IRWM Grant Program Guidelines* (DWR, April 2019), because it is a local public agency of the State of California organized and operating under County Water District Law, California Water Code §30000, et seq. and Coachella District Merger Law, Water Code Section §33100, et seq. CVWD is a State Water Project Contractor and Colorado River Contractor empowered to deliver water supplies to its service area.

Per the adopted *Memorandum of Understanding (MOU) among City of Coachella/Coachella Water Authority, Coachella Valley Water District, Desert Water Agency, City of Indio/Indio Water Authority, Valley Sanitary District and Mission Springs Water District for Development of an Integrated Regional Water Management Plan*, as formalized in the Fourth Supplement to the MOU, CVWD has been designated as the administrating agency of this Implementation Grant as directed by the Coachella Valley Regional Water Management Group (CVRWMG). CVWD is the applicant, submitting this grant proposal on behalf of the following entities:

- Grant Administration: CVWD - public agency
- Project 1: CVWD – see above
- Project 2 & 6: Desert Water Agency (DWA) - public agency
- Project 3: Mission Springs Water District (MSWD) - public agency
- Project 4: Coachella Water Authority (CWA) - public agency
- Project 5: Pueblo Unido Community Development Corporation (Pueblo Unido CDC) - non-governmental organization

The application will also include a Grant Administration project (to be implemented by CVWD) for the purposes of administering the Proposition 1, Round 2 grant and coordinating with the entities listed above. CVWD has submitted for and been awarded several IRWM Grant agreements since January 1, 2012, including:

- Prop 84-Round 2 in March 2013 – Grant Agreement No. 4600010577
- Prop 84-Drought Round (Round 3) in July 2014 – Grant Agreement No. 4600010887
- Prop 84-Round 4 in August 2015 – Grant Agreement No. 4600011522
- Prop 1-Round 1 Disadvantaged Community Involvement Grant in November 2016 – Grant Agreement No. 4600012245
- Prop 1-Round 1 Implementation Grant in July 2020 – Grant Agreement No. 4600013805

IRWM Plan and Project Eligibility

In 2018, the CVRWMG updated its 2014 Coachella Valley IRWM Plan to be consistent with the *2016 IRWM Grant Program Guidelines – Volume 2: IRWM Planning Standards* (DWR 2016) and CWC §10543. The 2018 update integrated the necessary components of the 2016 IRWM Plan standards with the *2015 Proposition 1 Stormwater Grant Program Guidelines* (SWRCB 2015) guidance for Storm Water Resources (SWR) Plans. The resulting *2018 Coachella Valley IRWM/SWR Plan* (CVRWMG 2018) was finalized in December 2018 and formally adopted by CVRWMG agencies' governing bodies.

- RWMG:
  - CVWD (Applicant): April 23, 2019
  - CWA: September 25, 2019
  - MSWD: May 20, 2019
  - DWA: May 21, 2019
  - Indio Water Authority (IWA): May 1, 2019
  - VSD: April 23, 2019
- Project 1: CVWD: (see above)
- Project 2 & 6: DWA (see above)
- Project 3: MSWD (see above)
- Project 4: CWA (see above)
- Project 5: Pueblo Unido CDC (N/A - Pueblo Unido CDC is not required to adopt the 2018 Coachella Valley IRWM/SWR Plan since they are a non-governmental organization).

The *2018 Coachella Valley IRWM/SWR Plan* was submitted to DWR on December 24, 2018. DWR issued a Draft Review of the *2018 Coachella Valley IRWM/SWR Plan* on February 22, 2019, which initiated the beginning of the 30-day public comment period. DWR issued a Final Review to CVWD on April 9, 2019, indicating that no comments had been received and that DWR had determined that the *2018 Coachella Valley IRWM/SWR Plan* is consistent with the IRWM Planning Act and the related IRWM Plan Standards contained in the 2016 IRWM Grant Program Guidelines.

A key element of successful IRWM planning is the identification of implementation projects to achieve specific IRWM Plan goals and objectives. Stakeholders in the Coachella Valley IRWM Region are encouraged to submit implementation project proposals that they would like to have considered for inclusion in the Coachella Valley IRWM Plan Update and funding applications. All projects that are consistent with one or more of the IRWM Plan objectives are considered for inclusion in the IRWM Plan. All proposed projects submitted in this application are included in the *2018 Coachella Valley IRWM/SWR Plan* project database.

The proposal contained herein meets the purpose of Proposition 1.

All proposed projects submitted in this application have a useful life consistent with Government Code 16727.

- Project 1: CVWD – 50 years
- Project 2: DWA – 20 years
- Project 3: MSWD – 50 years
- Project 4: CWA – 50 years
- Project 5: Pueblo Unido CDC – 40 years
- Project 6: DWA – 100 years

Urban Water Management Compliance

All urban water suppliers included as project proponents in this *2022 IRWM Implementation Grant Proposal* are compliant with the urban water management, water loss, water meter, and water conservation reporting requirements listed in the *2022 PSP*.

Urban Water Management Plan Compliance

There are five urban water suppliers that will receive funding from the proposed grant, including: CVWD, CWA, MSWD and, DWA, along with IWA who is a participant under the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project. The five water supply agencies that are included within the CVRWMG (CWA, CVWD, DWA, IWA, and MSWD) were all required by the Urban Water Management Planning Act (CWC §10610 et seq.) to submit a 2020 UWMP to DWR by July 1, 2021.

Water Loss Audit Report (SB 555 Compliance)

In accordance with Senate Bill 555, all urban water suppliers are required to have submitted a complete and validated water loss audit report to DWR. The five urban water suppliers that will receive funding from the proposed grant are required to comply.

Water Meter Compliance

As defined in the *2022 PSP*, CWC §525 *et seq.* requires urban water suppliers applying for IRWM grant funds to demonstrate that they meet the State's water metering requirements. CVWD, CWA, MSWD, and DWA, along with IWA who is a participant under the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project have submitted water meter compliance forms, confirming whether the agency is subject to compliance by checking the urban water supplier grant.

Water Conservation and Production Reporting

As defined in the *2022 PSP*, urban water suppliers applying for IRWM grant funds are required to demonstrate that they meet the State Water Resources Control Board's Water Conservation and Production Reporting requirement. CVWD, CWA, MSWD and, DWA, along with IWA, who is a participant under the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project have submitted reports as of July 2022.

Agricultural Water Management and Measurement Compliance

CWA, DWA, IWA, and MSWD are not agricultural water suppliers and are therefore not required to complete Agricultural Water Management Plans.

CVWD is an agricultural water supplier; however, because CVWD receives agricultural water supplies from the Colorado River, CVWD is exempt from the State of California's requirement to have an Agricultural Water Management Plan under the Quantification Settlement Agreement. However, CVWD is required to have a Colorado River Water Agricultural Water Conservation Plan and submit it to the United States Bureau of Reclamation. The plan was last updated in 2021.

Contact information for the one agricultural water supplier that would receive funding from the proposed grant is provided below:

- Contact: Ivory Reyburn
  Phone Number: (760) 398-2661 ext. 2200
  Email Address: IReyburn@cvwd.org

DWR verification documentation: Not applicable for reasons mentioned above

Surface Water Diverter Compliance

CVWD and DWA are the only surface water diverters that would receive funding from the proposed grant. CWA, IWA, and MSWD are not surface water diverters.

CVWD has three appropriative surface water applications that are permitted, including:

- Whitewater River – Application Number: A001122
- Colorado River – Application Number: A0007843
- Tributary Creeks, including Andreas Canyon Creek, Falls Creek, Murray Canyon Creek, Palm Canyon Creek, Snow Creek Tahquitz Creek, and Whitewater River – Application Number: A002922

The reports were submitted to State Water Resources Control Board – Division of Water Rights (SWRCB-DWR) in March 2022 for January through September 2021.

DWA has three appropriative surface water applications and one groundwater recordation:

- Snow Creek (2) – Application Numbers: A004752 and A013067
- Falls Creek – Application Number: A008957
- Chino Creek – Recordation Number: G331035The reports were submitted to SWRCB-DWR in 2022 for 2021.

Table 1-2: Contact Information for Surface Water Diverters

Project	Agency	Contact Name	Phone	Email	Verification Documentation Date
1	**CVWD**	Ivory Reyburn	(760) 398-2661 ext. 2200	IReyburn@cvwd.org	March 15, 2022
2,6	**DWA**	Ashley Metzger	(760) 323-4971 ext. 184	AMetzger@dwa.org	March 16, 2022

Groundwater Management Compliance

There are many groundwater users in the region including municipal agencies, private pumpers, and small water systems. The five municipal agencies that will receive funding from the proposed grant are CVWD, DWA, CWA, IWA, and MSWD. These five agencies are participating in groundwater management compliance. The groundwater contacts for these entities are provided below:

- Coachella Valley Water District:
    - Contact: Ivory Reyburn
      Phone Number: (760) 398-2661 ext. 2200
      Email Address: IReyburn@cvwd.org
- Coachella Water Authority:
    - Contact: Castulo Estrada
      Phone Number: (760) 501-8100 ext. 232
      Email Address: cestrada@coachella.org
- Desert Water Agency:
    - Contact: Ashley Metzger
      Phone Number: (760) 323-4971 ext. 184
      Email Address: ametzger@dwa.org
- Mission Springs Water District:
    - Contact: Brian Macy
      Phone Number: (760) 660-4397
      Email Address: bmacy@mswd.org
- Indio Water Authority:
    - Contact: Reymundo Trejo
      Phone Number: (760) 625-1821
      Email Address: retrejo@indio.org

As shown in **Table 1-3**, the four groundwater subbasins that constitute the Coachella Valley IRWM Region are the Indio (7-21.01), Mission Creek (7-21.02), and Desert Hot Springs (7-21.03 groundwater subbasins. The West Salton Sea groundwater basin is outside of the Coachella Valley Groundwater Basin, but is within the CVRWMG boundary. Due to the need to supplement limited natural recharge to the Coachella Valley Groundwater Basin, water purveyors within the Coachella Valley have been implementing various programs to address and avoid overdraft and historical declines in groundwater levels. CVWD and DWA have been implementing groundwater replenishment in the West Whitewater River Subbasin Area of Benefit since 1973, and in the Mission Creek Subbasin since 2002, through direct replenishment at the Whitewater River Groundwater Replenishment Facility and Mission Creek Groundwater Replenishment Facility, respectively. CVWD also operates two additional replenishment facilities in the lower West Whitewater River Subbasin Area of Benefit and East Whitewater River Subbasin Area of Benefit. These are the Palm Desert Groundwater Replenishment Facility and Thomas E. Levy Groundwater Replenishment Facility respectively.

Table 1-3: Groundwater Subbasins and Sub-Areas in the Coachella Valley Groundwater Basin[1]

DWR Bulletin 118		Coachella Valley IRWM/SWR Plan		
Basin Number	Basin Name	Basin Name	Sub AREA Name	
7-21.01	Indio	Whitewater River	West Whitewater River Subbasin Management Area	Palm Springs
				Indio Hills
				Thousand Palms
				Thermal (Western Coachella Valley)[2]
			East Whitewater River Subbasin Management Area	Thermal (Eastern Coachella Valley)[2]
				Oasis
				Barton Canyon
		Garnet Hill	Garnet Hill	
7-21.02	Mission Creek	Mission Creek	Mission Creek	
7-21.03	Desert Hot Springs	Desert Hot Springs	Miracle Hill	
			Sky Valley	
			Fargo Canyon	
			Mecca Hills	
7-22	West Salton Sea	West Salton Sea	West Salton Sea	

[1] A groundwater breakdown for both the Indio and Mission Creek Subbasins are located in the SGMA Annual Reports located at https://sgma.water.ca.gov/portal/

[2] Thermal Subarea is located in both the West and East Whitewater River Subbasins, which are divided along the eastern Coachella Valley-western Coachella Valley division of the Coachella Valley.

The Indio and Mission Creek Subbasins are both designated as medium priority basins under the Sustainable Groundwater Management Act (SGMA). Groundwater Sustainability Agencies (GSAs) were required to be formed for the two-medium priority subbasins, Indio and Mission Creek, by June 30, 2017, and to develop Groundwater Sustainability Plans (GSPs) or Alternative Plan by January 31, 2022. CVWD, CWA, DWA, and IWA submitted application materials to become GSAs for the Indio Subbasin. CVWD and DWA submitted application materials to become GSAs for the Mission Creek Subbasin and have worked together with MSWD as the Mission Creek Subbasin Management Committee to manage the Mission Creek Subbasin.

Implementation of SGMA for the Indio Subbasin is done via coordination of CVWD, CWA, DWA, and IWA. These agencies have submitted the necessary declarations and documentation to DWR as it relates to the subbasin's Alternative Plan. CVWD, CWA, DWA, and IWA prepared the SGMA Alternative Groundwater Sustainability Plan Bridge Document for the Indio Subbasin to demonstrate that the 2010 Coachella Valley Water Management Plan Update is functionally equivalent to the requirements for a GSP. On December 29, 2021, CVWD, CWA, DWA, and IWA submitted *2022 Indio Subbasin Water Management Plan Update* to DWR and is awaiting approval.

Implementation of SGMA for the Mission Creek Subbasin is done via coordination of CVWD, MSWD, and DWA, which have already submitted the necessary declarations and documentation to DWR as it relates to the subbasin's Alternative Plan. CVWD, DWA, and MSWD prepared the SGMA Alternative Groundwater Sustainability Plan Bridge Document for the Mission Creek Subbasin to demonstrate that the *2013 Mission Creek-*

Garnet Hill Water Management Plan is functionally equivalent to the requirements for a GSP. On December 30, 2021, CVWD, MSWD, and DWA submitted the *2022 Mission Creek Subbasin Alternative Plan Update* to DWR. In March 2022, the 2022 Mission Creek Subbasin Alternative Plan Update was revised to address a slight discrepancy between groundwater model forecast pumping simulations and projections for the period 2020 through 2069. The forecast model has been corrected to match the pumping projections.

CASGEM Compliance

The four groundwater subbasins that are within the Coachella Valley IRWM Region are the Indio (7-21.01), Mission Creek (7-21.02), and Desert Hot Springs (7-21.03). The Mission Creek and Indio subbasins are designated as medium-priority basins by DWR, and the Desert Hot Springs subbasin is designated as a low-priority subbasin. There are no high-priority basins in the Region.

As established in CWC §10933.7(a), those basins prioritized as a high- or medium-priority groundwater basin must have a designated monitoring entity or the organizations within those basins will not be eligible for State funding per the requirements of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program.

Following implementation of SGMA (described above), medium priority basins are compliant via the monitoring and reporting tasks associated with SGMA. For the Indio Subbasin, 57 wells are monitored and reported via the SGMA monitoring network module. For the Mission Creek Subbasin, 9 wells are monitored and reported via the SGMA monitoring network module.

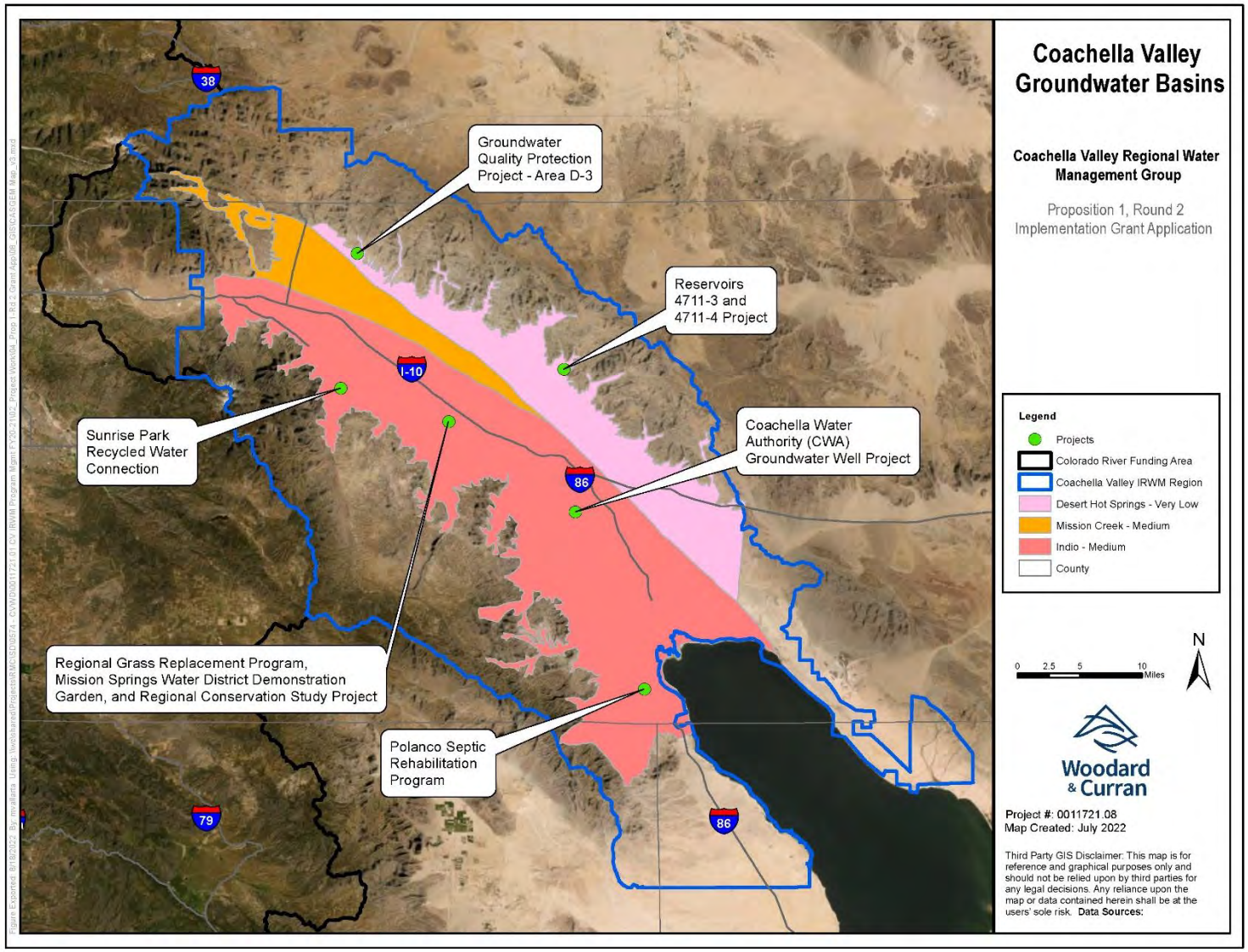
Project-specific compliance information for the projects included within this Proposal are provided in **Table 1-5**.

Table 1-5: CASGEM Monitoring Summary for the Proposal

Project	Implementing Agency	Groundwater Basins that Project Overlies	Basin Priority per CASGEM	Monitoring Program
Reservoirs 4711-3 and 4711-4 Project	CVWD	Indio	Medium	SGMA
Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project	CVWD, CWA, DWA, MSWD, and IWA	Indio	Medium	SGMA
		Mission Creek	Medium	SGMA
		Desert Hot Springs	Low	CASGEM
Groundwater Quality Projection Project Area D-3	MSWD	Desert Hot Springs	Very Low	CASGEM
Coachella Water Authority Groundwater Well Project	CWA	Indio	Medium	SGMA
Polanco Septic Rehabilitation Program	Pueblo Unido CDC	Indio	Medium	SGMA

Sunrise Park Recycled Water Connection	DWA	Indio	Medium	SGMA

Figure 1-1: Coachella Valley Groundwater Basins



Stormwater Management Plan Compliance

In 2018, the CVRWMG updated its 2014 Coachella Valley IRWM Plan to be consistent with the 2016 IRWM Grant Program Guidelines – Volume 2: IRWM Planning Standards (DWR 2016) and CWC §10543. The 2018 update integrated the necessary components of the 2016 IRWM Plan standards with the 2015 Proposition 1 Stormwater Grant Program Guidelines (SWRCB 2015) guidance for Storm Water Resources (SWR) Plans. The resulting *2018 Coachella Valley IRWM/SWR Plan* (CVRWMG 2018) was finalized in December 2018 and formally adopted by CVRWMG agencies' governing bodies.

No stormwater projects are included in this application.

Coachella Valley Water District
Board of Directors

Resolution No: 2022-33

RESOLUTION OF THE BOARD OF DIRECTORS OF COACHELLA VALLEY WATER DISTRICT AUTHORIZING THE GENERAL MANAGER OR HIS DESIGNEE TO SUBMIT A ROUND 2 INTEGRATED REGIONAL WATER MANAGEMENT IMPLEMENTATION GRANT APPLICATION FOR $4,112,755, ACCEPT THE GRANT FUNDS THAT ARE AWARDED, ENTER INTO CONTRACTS TO DISTRIBUTE THE FUNDS TO PROJECT SPONSORS, AND SERVE AS LEAD AGENCY FOR CALIFORNIA ENVIRONMENTAL QUALITY ACT COMPLIANCE AS NECESSARY

WHEREAS, Proposition 1, the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Water Code Section 79700 *et seq.),* authorized the California Legislature to appropriate $510 million to encourage integrated regional water management planning in California; and

WHEREAS, Section 79744(a) of the California Water Code appropriated to the Department of Water Resources funds for integrated regional water management programs, projects and other purposes; and

WHEREAS, DWR is making these funds available through several grant programs; and

WHEREAS, achieving Integrated Regional Water Management (IRWM) grant funding will help to achieve the regional water supply goals established in the 2020 Coachella Valley Regional Urban Water Management Plan and the groundwater sustainability goals established in the Sustainable Groundwater Management Act, and to prepare the Coachella Valley Region for the impacts of drought; and

WHEREAS, the Coachella Valley Water Management Group will prepare an application for a Round 2 Integrated Regional Water Management Implementation Grant to support the development of high-priority water management projects in the Coachella Valley Region; and

WHEREAS, on June 21, 2022, the Coachella Valley Water Management Group and Coachella Valley Planning Partners recommended the Coachella Valley Water District Board authorize submittal of Coachella Valley Region's application for a Round 2 Integrated Regional Water Management Implementation Grant; and

WHEREAS, the memorandum of understanding that established the Coachella Valley IRWM Program identifies the Coachella Valley Water District as the program's authorized representative; and

Coachella Valley Water District
Board of Directors

Resolution No: 2022-33

WHEREAS, the Coachella Valley Water District Board of Directors is the decision-making body for the Coachella Valley Water District; and

WHEREAS, grant application procedures established by DWR require applicants to provide a copy of a resolution adopted by the applicant's governing body designating an authorized representative to file an application for an IRWM planning grant.

WHEREAS, the Colorado River Funding Area (CRFA) Regional Water Management Groups (RWMGs) have entered into a Memorandum of Understanding setting forth the division of the grant funds between the CRFA; and

WHEREAS, the Coachella Valley RWMG, of which Coachella Valley Water District is a member agency, is allocated $4.1 million for projects in the Coachella Valley.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the District as follows:

1. The General Manager or his designee is authorized to prepare the necessary data, conduct investigations and submit a Proposition1, Round 2 Integrated Regional Water Management Implementation Grant application.

2. The General Manager or his designee is authorized to execute a grant agreement or any amendments thereto to receive a Proposition 1, Round 2 Integrated Regional Water Management Implementation Grant from the California Department of Water Resources.

3. The General Manager or his designee is authorized to accept the grant funds that are awarded, enter into contracts to distribute the awarded grant funds to the project sponsors, and sign all necessary documentation (e.g. invoices, progress reports, etc.).

PASSED and ADOPTED by the Coachella Valley Water District Board of Directors during a regular meeting on this 26th day of July 2022, by the following vote:

AYES: Powell, Nelson, Aguilar, Bianco

NOES: None

ABSENT: Estrada

Sylvia M. Bermudez, MMC
Clerk of the Board
Coachella Valley Water District

Indio GSA Letter of Support

August 19, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of Indio Subbasin Groundwater Sustainability Agencies (GSAs) – comprised of Coachella Valley Water District (CVWD), Coachella Water Authority (CWA), Desert Water Agency (DWA), and Indio Water Authority (IWA) – we are pleased to submit this letter of support for the *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal.*

The Indio Subbasin of the Coachella Valley Groundwater Basin was designated as a medium-priority subbasin by the California Department of Water Resources (DWR). Since their establishment as GSAs, CVWD, CWA, DWA and IWA have worked together to implement SGMA requirements. This collaborative effort led to the submittal and approval by DWR of the 2010 Coachella Valley Water Management Plan as an Alternative Plan for the Indio Subbasin. More recently, the GSAs prepared the first periodic evaluation and update of the Alternative Plan, submitting *the 2022 Indio Subbasin Water Management Plan Update* to DWR in December 2021.

We understand that to achieve the objectives of SGMA, the State must invest in groundwater planning and other actions to improve groundwater sustainability. The Coachella Valley Groundwater Basin is critical because it provides safe drinking water for our communities. CVWD's grant application for the *2022 Coachella Valley IRWM Proposition 1 Round 2 Implementation Grant Proposal* will support sustainable groundwater management by conserving water, reducing groundwater pumping, and protecting water quality.

Grant funding received through the IRWM grant program will reduce financial burden on disadvantaged communities (DACs) within the Indio Subbasin by helping to maintain the Coachella Valley's water supply reliability. Together, the activities included in this proposal will contribute to implementation of projects that advance groundwater sustainability in the Coachella Valley.

Sincerely,

Mark S. Krause
General Manager – Chief Engineer
Desert Water Agency

Jim Barrett
General Manager
Coachella Valley Water District

Cástulo R. Estrada
Utilities Manager
Coachella Water Authority

Reymundo Trejo, P.E.
General Manager
Indio Water Authority

Mission Creek Subbasin Management Committee
Letter of Support

August 19, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of Mission Creek Subbasin Management Committee – comprised of Coachella Valley Water District (CVWD), Desert Water Agency (DWA), and Mission Springs Water District (MSWD) – we are pleased to submit this letter of support for the *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal.*

The Mission Creek Subbasin of the Coachella Valley Groundwater Basin is designated as a medium-priority subbasin by the California Department of Water Resources (DWR). Since their establishment as GSAs, CVWD and DWA have worked together with MSWD as the Mission Creek Subbasin Management Committee to implement SGMA requirements. This collaborative effort led to the submittal and approval by DWR of the 2013 *Mission Creek-Garnet Hill Water Management Plan* as an Alternative Plan for the Mission Creek Subbasin. More recently, the Mission Creek Subbasin Management Committee prepared the first periodic evaluation and update of the Alternative Plan, submitting the *2022 Mission Creek Subbasin Alternative Plan Update* to DWR in December 2021.

We understand that to achieve the objectives of SGMA, the State must invest in groundwater planning and other actions to improve groundwater sustainability. The Coachella Valley Groundwater Basin is critical because it provides safe drinking water for our communities. CVWD's grant application for the *2022 Coachella Valley IRWM Implementation Grant Proposal* will support sustainable groundwater management by conserving water, reducing groundwater pumping, and protecting water quality.

Grant funding received through the IRWM grant program will reduce financial burden on disadvantaged communities (DACs) within the Mission Creek Subbasin by helping to maintain the Coachella Valley's water supply reliability. Together, the activities included in this proposal will contribute to implementation of projects that advance groundwater sustainability in the Coachella Valley.

Sincerely,

Jim Barrett
General Manager
Coachella Valley Water District

Arden Wallum
General Manager – Chief Engineer
Mission Springs Water District

Mark S. Krause
General Manager – Chief Engineer
Desert Water Agency

Attachment **2**

Coachella Valley Integrated Regional Water Management

2022 IRWM Implementation Grant Proposal

Work Plan

Attachment 2 consists of the following items:

- ✓ **Work Plan.** This attachment includes a description of the tasks necessary to complete each project in the Proposal, including necessary deliverables, and the current status of each project.

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Project 1: Reservoirs 4711-3 and 4711-4 Project

Implementing Agency

Local Project Sponsor: Coachella Valley Water District (CVWD)
Partners: Riverside County Fire Department and Indio Hills Community Council

Project Description

The Project will construct Reservoirs 4711-3 and 4711-4, two new 1 million gallon (MG) aboveground welded steel tanks and demolish the existing 100,000 gallon bolted-steel tanks, Reservoirs 4711-1 and 4711-2. Reservoirs 4711-1 and 4711-2 were originally constructed in 1993 and 1999 and have developed moderate-to-severe corrosion along their bolt seams. These existing bolted-steel tanks no longer provide reliable water storage due to the general deterioration, corrosion, and minor leaks. The Project will restore and improve water storage infrastructure and ensure reliable and sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills.

Water storage capacity for the Indio Hills Pressure Zone is inadequate and the existing tanks cannot accommodate the current or future water demands and fire flows. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This exposes the region to water insecurities and results in poor water supply reliability, as low pressures can pull contaminants into the pipe distribution system negatively impacting water quality, as well as decrease the system's fire suppression readiness, which requires higher water pressures than what is typically needed for residential customers. Additionally, the existing tanks must be shut off during repairs, which means CVWD customers do not have access to this water supply during this time. Meeting these needs will make the area more resilient to water scarcity issues by creating a more regionally independent water system.

The tanks will be constructed above grade on CVWD-owned land adjacent to the existing Reservoirs 4711-1 and 4711-2, thus requiring minimal piping, approximately 200 linear feet of 12-inch diameter ductile iron pipe (DIP), to connect to the CVWD water system. The construction components of the Project include the following:

- excavation;
- grading;
- soil compaction;
- construction of two 76-foot diameter by 5-foot deep foundations;
- two 1 MG welded-steel tanks equipped with cathodic protection to decrease corrosion;
- all required aboveground and buried appurtenances; and,
- all required infrastructure.

Following the construction and initial operation of proposed Reservoirs 4711-3 and 4711-4, Reservoirs 4711-1 and 4711-2 and associated appurtenances and infrastructure will be demolished and removed from the project site. This demolition will include the removal of existing aboveground meters, valves, and pipelines as well as the existing riprap revetment and perimeter chain-link fence.

Quantitative Benefits	
Water Supply. The project will provide 2 MG of water storage to accommodate peak existing and future demands, including fire flows. This was calculated based on the size of each reservoir.	**Water Supply Reliability.** The project will improve water supply reliability for approximately 800 people living in the Indio Hills, which is classified as a disadvantaged community (DAC). This calculation was based on the population of Indio Hills Census Designated Place, using the United States (U.S.)

	Census American Community Survey (ACS) data from 2016 – 2020.

Disadvantaged Community Status

A DAC is defined as a community with an annual median household income (MHI) of less than 80% of the statewide MHI, and a severely disadvantaged community (SDAC) is defined as a community with an annual MHI of less than 60% of the statewide MHI. Based on the U.S. Census Bureau ACS for 2016-20202, the statewide MHI is $78,672. Therefore, DACs are communities with an MHI of less than $62,938, and SDACs are communities with an MHI of less than $47,203.

The community of Indio Hills in the project area has a MHI of $41,964, qualifying the community as a SDAC.

Work Plan

A Work Plan for the Reservoirs 4711-3 and 4711-4 Project, including the anticipated tasks necessary to complete the project, the deliverables of the project, and the percent complete for each proposed task, is provided in **Table 2-1**.

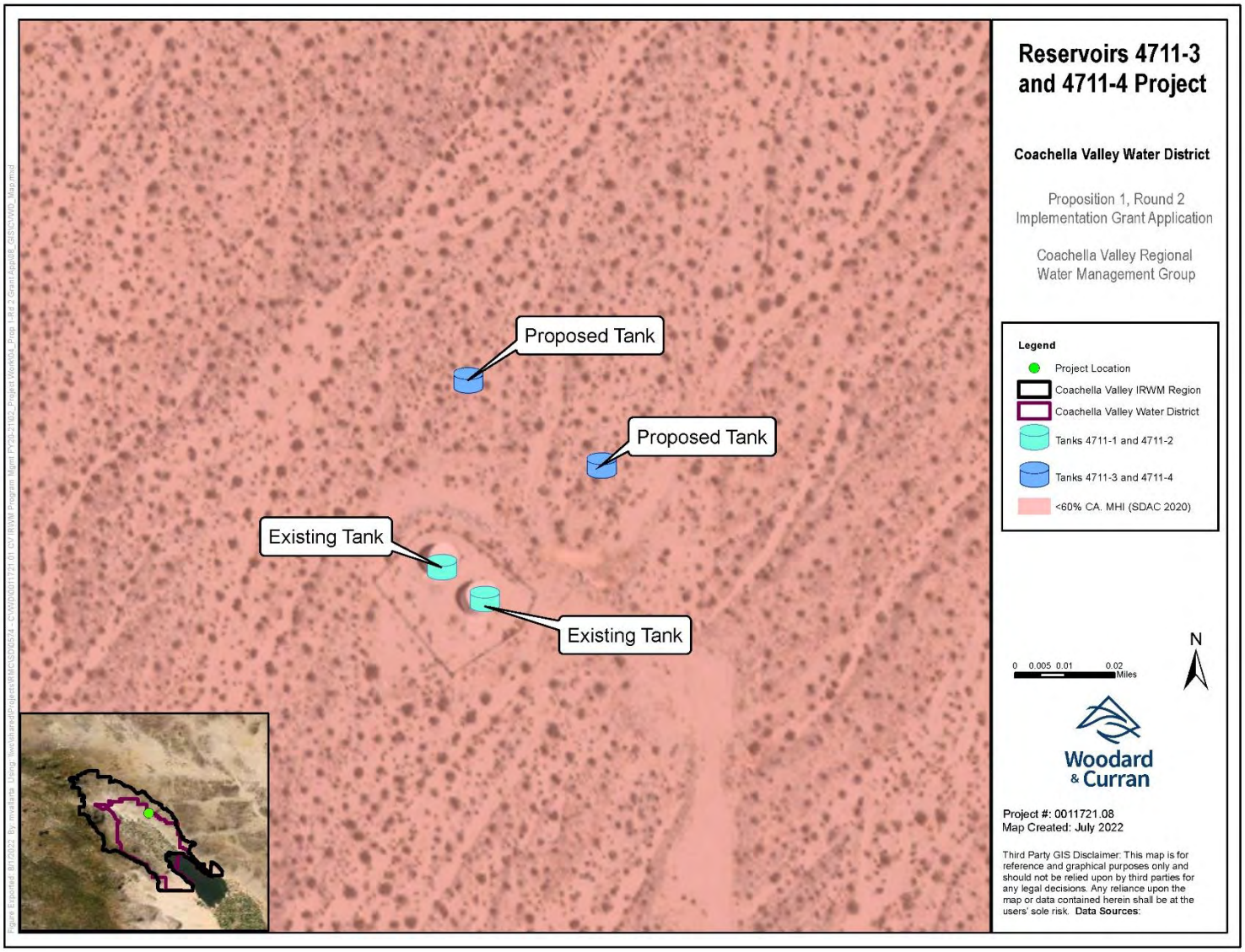
Table 2-1: Work Plan for Reservoirs 4711-3 and 4711-4 Project

Task and Description of Work to be Completed	Deliverables	%*
Budget Category (a): Project Administration		
1: Project Management – Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with IRWM regional manager. Prepare invoices including relevant supporting documentation for submittal to DWR via Grantee. This task also includes administrative responsibilities associated with the project, such as coordinating with partnering agencies and managing consultants/contractors.	• Invoices and associated backup documentation	0%
2: Reporting – Prepare progress reports detailing work completed during reporting period as outlined in Exhibit F of the Agreement. Submit reports to DWR. Prepare Project Completion Report and submit to DWR no later than 90 days after project completion for DWR Project Manager's comment and review. The report shall be prepared and presented in accordance with guidance as outlined in Exhibit F.	• Quarterly Project Progress Reports • Project Completion Report • Documentation of "Acknowledgement of Credit & Signage" per Standard Condition D.2	0%
Budget Category (b): Land Purchase/Easement		
3: Land Purchase – Approximate area of land to be purchased or easement(s) is not needed. CVWD already owns the property.	Not applicable.	NA
Budget Category (c): Planning/Design/Engineering/Environmental Documentation		
4: Feasibility Studies – No feasibility studies were completed as part of the project development process. The Project went straight to design.	Not applicable.	NA
5: CEQA Documentation – An initial Study (IS)/Mitigated Negative Declaration (MND) was filed for this project with the State Clearing House No. 20211090551 in November 2021. CVWD will prepare a letter stating no legal challenges.	• Final IS/MND • Legal Challenges Letter	100%
6: Permitting – Acquire the following permits for this project: • CVWD, approval of the IS/MND and associated Mitigation Monitoring and Reporting Plan (MMRP)	• Permits as required	50%

Task and Description of Work to be Completed	Deliverables	%*
• South Coast Air Quality Management District (SCAQMD) or County of Riverside, Fugitive Dust Permit • County of Riverside, Grading Permit • Riverside County Flood Control and Water Conservation District, Floodplain Permit • Regional Water Quality Control Board (RWQCB), Water Quality Certification under Section 401 of the CWA and/or Waste Discharge Requirement • California Department of Fish and Wildlife (CDFW), Section 1602 Lake and Streambed Alteration Agreement (LSAA) • State Water Resources Control Board (SWRCB)/RWQCB, Compliance with the National Pollutant Discharge Elimination System (NPDES) General Construction Permit, Order No. 2009-0009-DWQ through the preparation of a Stormwater Pollution Prevention Plan (SWPPP)		
7: Design – Final design of the project was completed in July 2022.	• 100% Design Plans and Specifications	100%
8: Project Monitoring Plan – Develop and submit a Project Monitoring Plan per Paragraph 16 for DWR's review and approval.	• Project Monitoring Plan	0%
Budget Category (d): Construction/Implementation		
9: Contract Services – This task will comply with the Standard Condition D.11 – Competitive Bidding and Procurements. Activities necessary (as applicable) to secure a contractor and award the contract, including develop bid documents, prepare advertisement and contract documents for construction contract bidding, conduct pre-bid meeting, bid opening and evaluation, selection of the contractor, award of contract, and issuance of notice to proceed.	• Bid Documents • Proof of Advertisement • Award of Contract • Notice to Proceed	0%
10. Construction Administration – This task includes managing contractor submittal review, answering requests for information, and issuing work directives. A full-time engineering construction observer will be on site for the duration of the project. Construction observer duties include documenting of pre-construction conditions, daily construction diary, preparing change orders, addressing questions of contractors on site, reviewing/updating project schedule, reviewing contractor log submittals and pay requests, forecasting cash flow, notifying contractor if work is not acceptable. Upon completing the project, the DWR Certificate of Project Completion and record drawings will be provided to DWR.	• Construction Management Contract • Inspection Reports • Submittal Log • Payment Requests • DWR Certificate of Project Completion • Record Drawings	0%
11. Construction/Implementation Activities – Construction activities are outlined below.		
Subtask 11(a): Mobilization and Demobilization **–** Mobilization and demobilization activities, including: preparing, submitting, and responding to submittals; all contractor administrative requirements (e.g., bonds, insurance); site cleanup and site restoration (e.g., final grading, landscaping, touch-up paint); furnishing all documentation (warranties, manuals, Standard Operating Procedure); and removal of all temporary facilities. *Subtask 11(b): Site Preparation* **–** Site preparation activities, including: setting up temporary facilities (e.g. field office, construction barriers). *Subtask 11(c): Installation, Construction, and Excavation* **–** Construction activities include excavation, grading, soil compaction, and construction of two 76-foot diameter by 5-foot-deep foundations, construction of two 1 MG welded tanks, construction of all required aboveground and buried appurtenances (e.g.	• Photographic Documentation of Progress	0%

Task and Description of Work to be Completed	Deliverables	%*
water meters, valves, 18-inch diameter connection to the existing Dillon Road Transmission Pipeline, etc.), and construction of all required infrastructure (e.g. riprap revetment north/upstream of the new reservoirs, perimeter chain-link fence, etc.).		
** The right-hand column displays % complete for each task.*		

Figure 2-1: Reservoirs 4711-3 and 4711-4 Project Map



Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project

Implementing Agency

Local Project Sponsor: Desert Water Agency (DWA)
Partners: Coachella Valley Water District, Coachella Water Authority, Indio Water Authority and Mission Springs Water District

Project Description

This project includes the following project components that are all implemented under the regional program:

Regional Grass Replacement Program: The Regional Grass Replacement Program is a multifaceted program that will make turf rebates available throughout the Coachella Valley Water Management Group's (CVRWMG) collective service area for a variety of water customers, including residential and multi-family sites. This program will assist the Region's water purveyors in effectively managing groundwater by reducing demands and groundwater pumping. The Regional Grass Replacement Program extends a grant-funded program that was established in 2014 to reduce water use in the Valley. The CVRWMG agencies are requesting funding to offset costs for the removal of turf and replacement with low water use landscape to lower outdoor water demand. By removing turf, customers will use less water to irrigate, and groundwater pumping can be reduced. This program is in high demand in Coachella Valley, as evidenced by successful completion of prior rounds of grass removal projects and continued and increased demand due to drought conditions and related state mandates.

The Regional Grass Replacement Program will reduce water demands for outdoor irrigation by removing turf, which is a "thirsty" plant that uses significant water. Removing turf will also reduce pumping for irrigation supplies and therefore protect existing groundwater supplies, leading to a reduced risk of overdraft, which has been a highlighted issue in the *2022 Indio Subbasin Water Management Plan Update (Alternative Plan Update)* and the *2022 Mission Creek Alternative Plan Update*. This project will reduce water use on a long-term basis and make the region less susceptible to emergency drought impacts and restrictions. As temperatures warm, remaining grass will need more water to thrive, so this project proactively heads off that demand. During extended droughts, more water will be left in storage.

Additionally, grass removal includes the removal of sprinklers in favor of drip irrigation or no irrigation. This results in less pesticide and fertilizer application and less dry weather urban runoff.

Mission Springs Water District Demonstration Garden: The demonstration garden will display water efficient irrigation systems, various ground covers, provide examples of maintaining challenging slopes and microclimates, as well as encourage the selection of current desert friendly varieties of plant material reflecting the most recent edition of the local MSWD's *Water Efficient Landscaping Guidelines* and Water-Wise Plant Guide. The centrally located garden will provide an excellent educational space for self-guided and group tours. The gardens will provide an area for educational workshops to provide real time demonstrations of topics such as pruning, vegetable gardening, selecting desert plants, and irrigation zones. The incorporation of technology is proposed into the garden via a web/phone application interface that will allow visitors to be able to look up in real time plant species, rock types, and irrigation elements by simply downloading the application and scanning an identification marker. Information will also be available in Spanish. The demonstration garden will educate the public on efficient outdoor water use, and visitors can apply efficient garden design in their own yards, thereby reducing water demands.

The demonstration garden will be constructed to be aesthetically pleasing and will be included in the tour of the new Critical Services Center in Desert Hot Springs, allowing many visitors to observe it. The demonstration garden will show the public how they can use desert-friendly, drought tolerant plants in lieu of turf in order to decrease their water usage while also maintaining an aesthetic landscape.

Regional Conservation Study Project: The study component of the project, the Regional Conservation Study Project, is a decision-support tool that will guide the agencies as they work to determine incentive amounts and

water supply benefits. The regional water outreach campaign, CV Water Counts, will promote the incentives and the study findings. The tool will:

- quantify grass replacement program water savings that account for local conditions and practices (local evapotranspiration (ET), soil types, irrigation efficiency);
- quantify the cost per acre-foot for turf replacement and the return on investment for agencies and program participants;
- develop data on the rate at which turf replacement participants return to turf after installing a low-water-use landscape;
- quantify the amount of turf remaining in the Coachella Valley available for future conversions;
- explore technologies that could better assist in monitoring of the items above; and
- consider other variables that may inform water conservation program development.

The water savings from all three programs will result in a reduction in the following: groundwater pumping, risk of groundwater basin overdraft, imported water usage, energy requirements, and greenhouse gas (GHG) production.

Quantitative Benefits	
Water Savings. Water savings from the Regional Grass Replacement Program will be about 57 AFY, which results in roughly 856 AF of water saved over the life of the project (15 years) and an associated reduction in energy cost and GHG emissions.	**Reduced Groundwater Pumping.** The water savings from the Turf Removal Program will result in reduced groundwater pumping. The reduction in groundwater pumping will be about 57 AFY, which results in a reduction of roughly 856 AF of groundwater pumped over the life of the project (15 years) and an associated reduction in energy cost and GHG emissions.

DAC Status

Almost the entire City of Coachella, Coachella Water Authority (CWA), Indio Water Authority (IWA), and Mission Springs Water District (MSWD) service areas are comprised of DACs, with some areas that qualify as SDACs. The CVRWMG project area and the community that CV Water Counts will serve is mapped by area as 48% SDAC and 17% DAC.

Work Plan

A Work Plan for the Regional Grass Replacement Project and Study, including the anticipated tasks necessary to complete the project, the deliverables of the project, and the percent complete for each proposed task, is provided in **Table 2-2**.

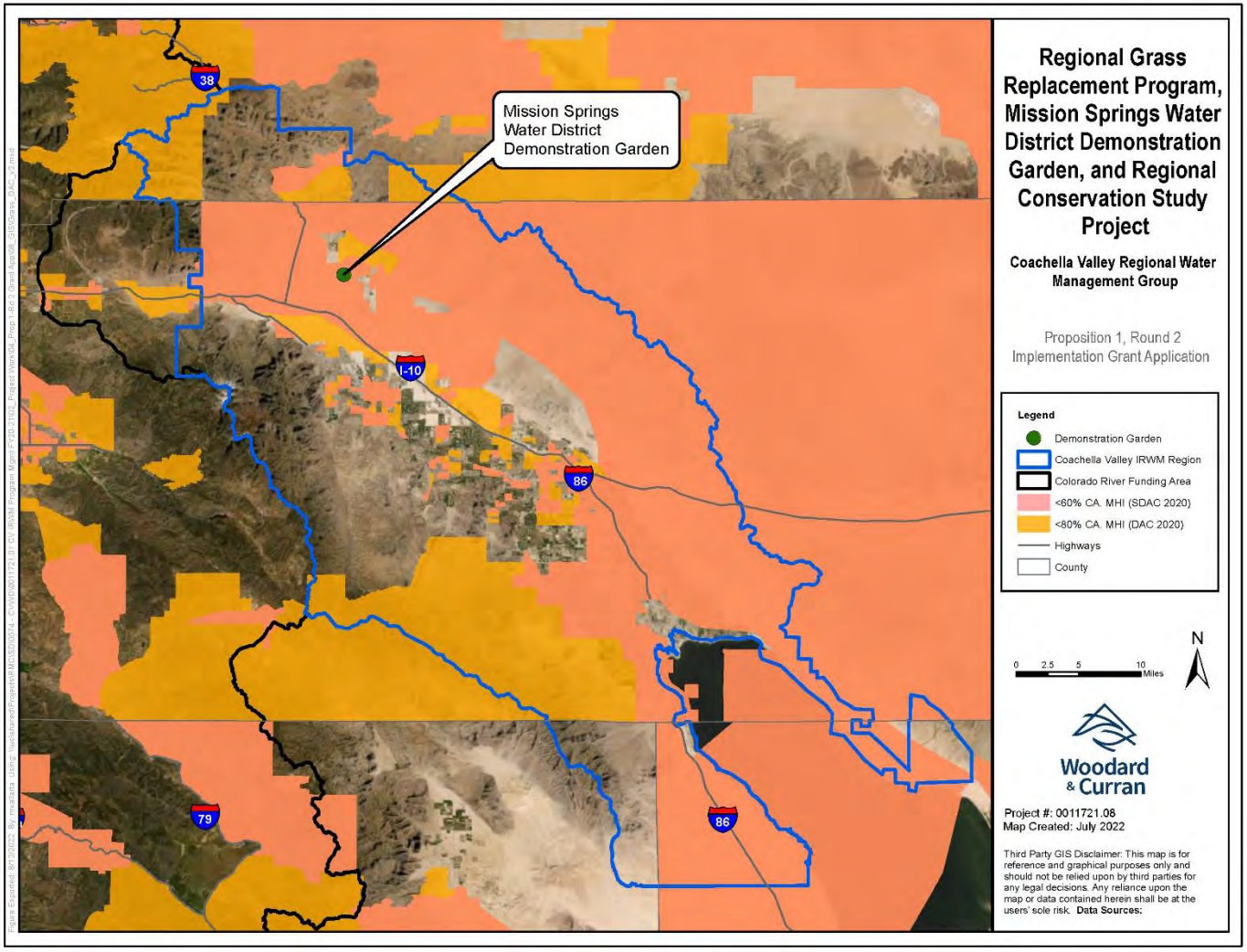
Table 2-2: Work for Regional Grass Replacement Project and Study

Task and Description of Work to be Completed	Deliverables	%*
Budget Category (a): Project Administration		
1: Project Management – Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with IRWM regional manager. Prepare invoices including relevant supporting documentation for submittal to DWR via Grantee. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.	• Invoices and Associated Backup Documentation	0%
2: Reporting – Prepare progress reports detailing work completed during reporting period as outlined in Exhibit F of the Agreement. Submit reports to DWR. Prepare Project Completion Report and submit to DWR no later than 90 days after project completion for DWR Project Manager's comment and review.	• Quarterly Project Progress Reports • Project Completion Report	0%

Task and Description of Work to be Completed	Deliverables	%*
The report shall be prepared and presented in accordance with guidance as outlined in Exhibit F.	• Documentation of "Acknowledgement of Credit & Signage" per Standard Condition D.2	
Budget Category (b): Land Purchase/Easement		
3: Land Purchase – Approximate area of land to be purchased or easement(s) is not needed. The turf removal program will make turf rebates available throughout the CVRWMG's collective service area, but those modifications will be made by property owners and will not require land purchase or easements. The MSWD Demonstration Garden will be located on MSWD-owned land.	• Not applicable	NA
Budget Category (C): Planning/Design/Engineering/Environmental Documentation		
4: Feasibility Studies – No feasibility studies were completed as part of the project development process. The feasibility of the project is evident due to the many successful years of grass conversions.	• Not applicable	NA
5: CEQA Documentation – The demonstration garden falls under the CEQA exemption for Class 4: Minor Alterations to Land (CEQA 15304). A Notice of Exemption (NOE) is to be filed for the Demonstration Garden.	• Notice of Exemption • Legal Challenges Letter	0%
6: Permitting – The demonstration garden will require a building permit with the City of Desert Hot Springs. No other permits are required.	• Approved Building Permit	0%
7: MSWD Demonstration Garden Design – Design for the demonstration garden includes a topographical survey and irrigation plans. MSWD will hire a consultant to prepare a base map, plans and specifications for the demonstration garden. The design will include a grading and irrigation plan and will be prepared in coordination with the City of Desert Hot Springs.	• MSWD Site Map, Plans and Specifications	0%
8: Project Monitoring Plan – Develop and submit a Project Monitoring Plan per Paragraph 16 for DWR's review and approval.	• Project Monitoring Plan	0%
Budget Category (d): Construction/Implementation		
9: Contract Services – This task will comply with the Standard Condition D.11 – Competitive Bidding and Procurements. This task includes activities necessary (as applicable) to secure a contractor and award the contract, including developing bid documents, preparing advertisement and contract documents for construction contract bidding, conducting pre-bid meeting, bid opening and evaluation, selecting the contractor, awarding of the contract, and issuing the notice to proceed. MSWD will follow these requirements to hire a contractor(s) for the construction of the demonstration garden. DWA will follow these requirements to hire a consultant to create the decision support tool.	• Bid Documents • Proof of Advertisement • Award of Contract • Notice to Proceed	0%
10. Construction Administration –This task includes managing contractor submittal review, answering requests for information, and issuing work directives. MSWD will hire a consultant to execute this task for the demonstration garden.	• Construction Management Contract • Inspection Reports • Submittal Log • Payment Requests • DWR Certificate of Project Completion • Record Drawings	0%
11. Construction/Implementation Activities – Construction activities are outlined below.		
Subtask 11(a): Regional Grass Replacement Program **–** This task includes implementing the Regional Grass Replacement Program, including application	• Site visit reports (pre and post) to measure	0%

Task and Description of Work to be Completed	Deliverables	%*
review and approval, pre- and post-site visits to customer sites, verification of successful project completion, customer support, rebate check processing, and program website maintenance. This task also includes work to measure and report program progress and budgeted funds for materials and equipment necessary to implement the water-efficient landscape upgrades. Eligible costs include, but are not limited to: water-efficient plants, mulch, hardware (weather-based controllers, irrigation piping, meters, valves, etc.). *Subtask 11(b): MSWD Demonstration Garden Construction* - This subtask includes construction of one garden. MSWD's Demonstration Garden will include site grading and soil preparation, installation of irrigation equipment, planting of desert-friendly plants, and application of fertilizer and mulch to protect new growth. The demonstration garden will be constructed to be aesthetically pleasing and will be included in the tour of the new Critical Services Center in Desert Hot Springs, allowing many visitors to observe it. *Subtask 11(c): 5. Regional Conservation Study Project* – This subtask includes work to complete a study/decision support tool. The tool will guide the agencies as they work to determine incentive amounts and water supply benefits.	water use and confirm installations; or • Original customer receipts for all materials involved in the program; or • Maps with geographic locations of program participants; or • Report documenting compliance with water budgets • Regional Conservation Study Project decision-support tool	
** The right-hand column displays % complete for each task.*		

Figure 2-2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project



Project 3: Groundwater Quality Protection Project – Area D-3

Implementing Agency

Local Project Sponsor: Mission Springs Water District (MSWD)
Partners: City of Desert Hot Springs and Colorado River Basin Regional Water Quality Control Board

Project Description

The Groundwater Quality Protection Program Area D-3 is part of Assessment District 18, approved by voters in December 2019, intended to continue MSWD's successful history of converting areas from an on-site septic disposal system to the public sewer collection and treatment system. Assessment District 18 provides match funding to complete these improvements. This application focuses on Area D-3 and its construction to connect 102 parcels to the MSWD sewer collection and treatment system and abate 81 on-site septic disposal systems. Engineering design and CEQA for Area D-3 were previously completed and only require a brief review and update to ensure compliance with the latest standards for bidding. This project will protect both the drinking water supplies and the hot water that is the basis of the spa economy for the City of Desert Hot Springs and the Coachella Valley.

The Groundwater Quality Protection Project is a comprehensive water resource management effort that:

1. Eliminates known pollution sources;
2. Reclaims water to reduce demand on limited groundwater resources;
3. Protects underground storage capacity; and
4. Leverages multiple funding opportunities

The Groundwater Quality Protection Project overlies a region where high-quality, potable water is delivered, but wastewater flows are not currently treated for direct reuse. Expansion of the sewer system, bringing additional influent to the Regional Water Reclamation Facility, will allow MSWD to reclaim water, reduce groundwater demand, and protect underground storage capacity – providing a sustainable water future for generations to come.

The project construction consists of approximately 4,900 linear feet of 8-inch vitrified clay pipe (VCP) sewer mainline, 3,500 linear feet of 4-inch VCP sewer laterals, 17 4-foot diameter manholes, 20,000-square feet of pavement/trench repair, and associated improvements.

Quantitative Benefits	
Water Quality Improvement. The amount of water quality improved is over 20,400 gpd (or 22.9 AFY).	**Water Supply** Treat and recharge over 20,400 gpd (or 22.9 AFY) of treated wastewater to the aquifer.

DAC Status

The project area is DAC, however, the project will also benefit the entire City of Desert Hot Springs. The City of Desert Hot Springs ranks 48th out of 48 cities in San Bernardino and Riverside Counties in MHI, and has a MHI of $37,818. As such, the City of Desert Hot Springs is a SDAC. MSWD was the lead agency in the implementation of the DAC specific funding option in the Proposition 84 grant funding program and was one of the four agencies selected for DAC grant funding. MSWD intends to continue this trend with Proposition 1 grant opportunities. The project will protect groundwater in this DAC from untreated septic flows by abating 81 septic systems and ensuring future infill development of the 21 vacant lots immediately connect to the wastewater collection and treatment system.

Work Plan

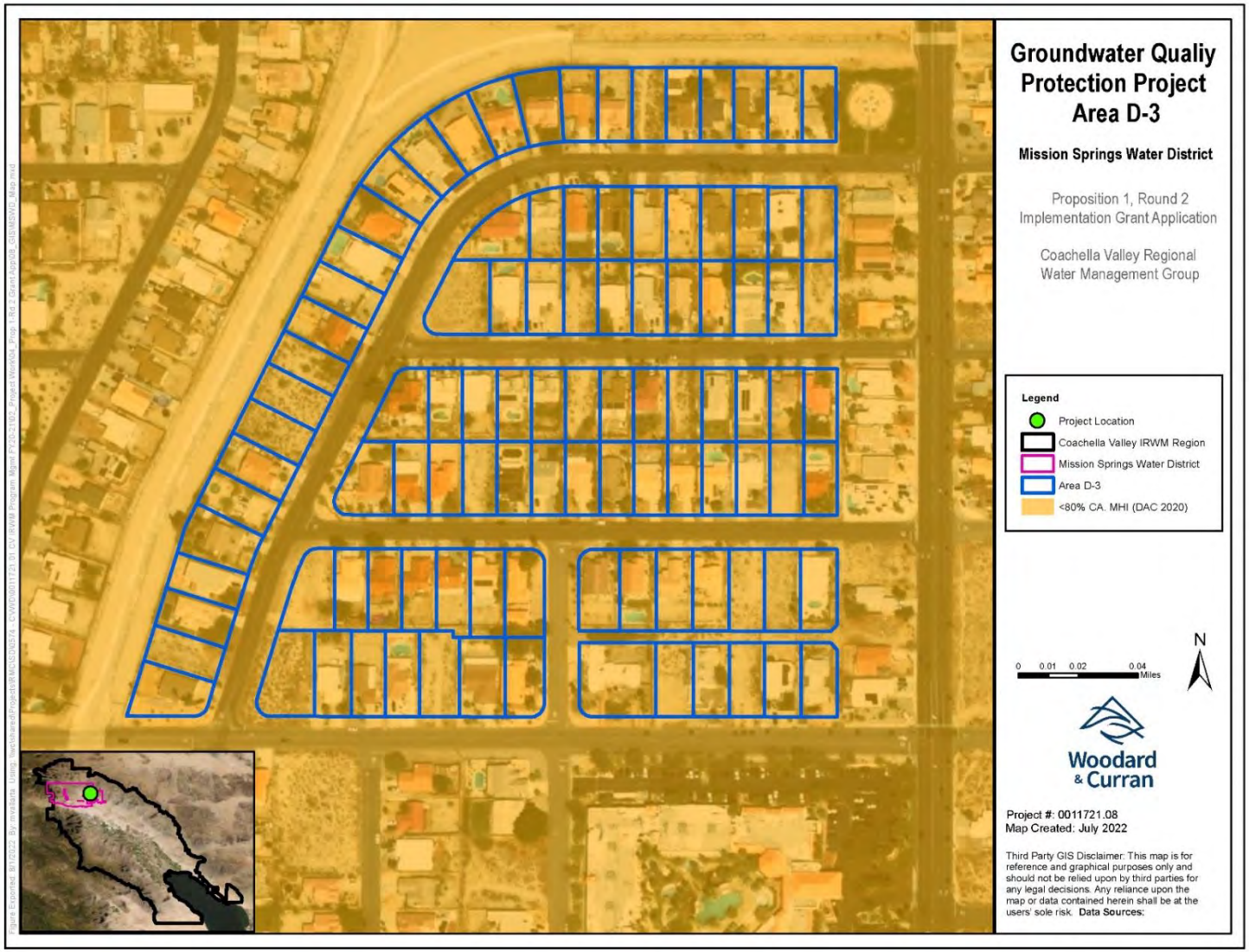
A Work Plan for the Groundwater Quality Protection Project – Area D-3, including the anticipated tasks necessary to complete the project, the deliverables of the project, and the percent complete for each proposed task, is provided in **Table 2-3**.

Table 2-3: Work Plan for Groundwater Quality Protection Project – Area D-3

Task and Description of Work to be Completed	Deliverables	%*
Budget Category (a): Project Administration		
1: Project Management – Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with IRWM regional manager. Prepare invoices including relevant supporting documentation for submittal to DWR via the Grantee. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.	• Invoices and associated backup documentation	0%
2: Reporting – Prepare progress reports detailing work completed during reporting period as outlined in Exhibit F of the Agreement. Submit reports to DWR. Prepare Project Completion Report and submit to DWR no later than 90 days after project completion for DWR Project Manager's comment and review. The report shall be prepared and presented in accordance with guidance as outlined in Exhibit F.	• Quarterly Project Progress Reports • Project Completion Report • Documentation of "Acknowledgement of Credit & Signage" per Standard Condition D.2	0%
Budget Category (b): Land Purchase/Easement		
3: Land Purchase – No land to be purchased or easement(s) acquired as all work will be completed within the public right-of-way.	• Not applicable	NA
Budget Category (c): Planning/Design/Engineering/Environmental Documentation		
4: Feasibility Studies – The following feasibility studies were completed as part of the project development process: • 1996 Groundwater Flow Study by Michigan Technological University; • 1996 Groundwater Contamination Study by USGS; • 2011 Nitrate Investigation in Groundwater by GSI Water; and • 2019 Assessment District No. 18 Engineer's Report	• Complete	100%
5: CEQA Documentation – All CEQA (Mitigated Negative Declaration) have been previously completed/approved and will be supplemented via addendum as required for the project. A Mitigated Negative Declaration ("Mission Springs Water District Sewer Improvement Project") with the Notice of Decision (NOD was filed March 1, 1999 (SCH#1998091062). An addendum titled "Addendum No. 1 for AD-12 Sewer Improvement Project: 1998" was prepared and NOD filed March 7, 2011. Area D-3 was a part of both documents. A second addendum for CEQA compliance will be completed.	• Re-certification of CEQA • Legal Challenges Letter	50%
6: Permitting – The following permits are anticipated to be acquired for this project: • Encroachment permit from City of Desert Hot Springs	• Encroachment permit from City of Desert Hot Springs	0%
7: Design – Design was completed in March 2015. Additional design refinements for this sub-area to commence in January 2023.	• Refined 100% Design Plans and Specifications	85%
8: Project Monitoring Plan – Develop and submit a Project Monitoring Plan per Paragraph 16 for DWR's review and approval.	• Project Monitoring Plan	0%
Budget Category (d): Construction/Implementation		
9: Contract Services – This task will comply with the Standard Condition D.11 – Competitive Bidding and Procurements. Activities necessary (as applicable) to secure a contractor and award the contract, including develop bid documents, prepare advertisement and contract documents for construction contract bidding, conduct pre-bid meeting, bid opening and evaluation,	• Bid Documents • Proof of Advertisement • Award of Contract • Notice to Proceed	0%

Task and Description of Work to be Completed	Deliverables	%*
selection of the contractor, award of contract, and issuance of notice to proceed.		
10. Construction Administration – This task includes managing contractor submittal review, answering requests for information, and issuing work directives. A full-time engineering construction observer will be on site for the duration of the project. Construction observer duties include documenting of pre-construction conditions, daily construction diary, preparing change orders, addressing questions of contractors on site, reviewing/updating project schedule, reviewing contractor log submittals and pay requests, forecasting cash flow, notifying contractor if work is not acceptable. Upon completing the project, the DWR Certificate of Project Completion and record drawings will be provided to DWR.	• Construction Management Contract • Inspection Reports • Submittal Log • Payment Requests • DWR Certificate of Project Completion • Record Drawings	0%
11. Construction/Implementation Activities – Construction activities are outlined below.		
Subtask 11(a): Mobilization and Demobilization – Mobilization includes equipment delivery, SWPPP BMP installation and management, potholing, and traffic control. Demobilization includes removal of surplus materials and equipment from the project site. *Subtask 11(b): Pipeline Construction* **–** Installation of approximately 4,900 linear feet of 8-inch VCP sewer mainline, 3,500 linear feet of 4-inch VCP sewer laterals, 17 4-foot diameter manholes, 20,000-square feet of pavement/trench repair, and associated improvements. This task also includes pavement removal, trenching, shoring, bedding, pipe installation, manhole installation, lateral construction, backfilling, compaction, connections, pavement restoration, striping, and clean up. Performance testing shall be per MSWD Developer/Contractors Guidelines Handbook and per the project plans and specifications. Inspection and testing are required by the project specifications. Testing includes air pressure testing of the sewer lines and backfill compaction testing. The contractor shall return construction and staging areas as reasonably as possible to original or improved conditions as a result of construction activities, including newly paved streets.	• Photographic Documentation of Progress • Engineers Certification • Performance testing results	0%
** The right-hand column displays % complete for each task.*		

Figure 2-3: Groundwater Quality Protection Project – Area D-3 Project Map



Project 4: Coachella Water Authority Groundwater Well Project

Implementing Agency

Local Project Sponsor: Coachella Water Authority (CWA)
Partners: None

Project Description

To ensure safe, clean drinking water for residents within its service area, CWA is in the process of consolidating small water systems (SWSs) that rely on individual, private groundwater wells into its potable water system. These SWSs often have poor water quality, poor water supply reliability, lack redundancy, and are small, DACs. In the next year, CWA is planning to consolidate Shady Lane Mobile Home Park (MHP), Mesquite Mutual Water Company (MMWC), and Castro's Mobile Home Community. All three SWSs previously relied on private, on-site wells to provide domestic water to a total of approximately 102 residential connections, as well as irrigation services. However, all three private wells exceeded the maximum contaminant level (MCL) for the hexavalent chromium drinking water standard and have failed in the past six years, leaving the residents with no water supply. Temporary emergency water supplies have since been provided by CWA and adjacent parcels; for example, two of these SWS are currently being served by a high line from nearby CWA fire hydrants. As the lack of dedicated water supplies and lack of redundancy put the residents of each of the SWSs at risk, consolidation into CWA's domestic water system was found to be the most feasible and long-lasting alternative. The SWSs are at risk of experiencing more severe drought impacts since they already have limited and unreliable supplies and poor water quality – issues that can be further exacerbated during times of drought.

In the future, CWA will continue to consolidate SWSs to improve water supply reliability and water quality for these small DACs.

The CWA Groundwater Well Project (Project) consists of the construction of one new groundwater well, which will increase CWA's overall capacity, improve operational flexibility by increasing the number of wells CWA has access to and can pump as needed to meet demands, and assist CWA in responding to drought impacts within its service area. The Project will ensure SWSs can be served with a high-quality, reliable water supply while alleviating the SWSs' susceptibility to drought conditions, as many lack the ability to purchase alternative water supplies, drill deeper wells, or repair wells should issues arise. Furthermore, the improved water supply reliability resulting from the Project will benefit all customers served by CWA and ensure adequate supply for new, planned connections including those for low and very low-income populations.

Quantitative Benefits	
Groundwater Production. Groundwater production by CWA would increase by approximately 2,500 AFY in order to serve newly consolidated SWS.	**Water Supply.** The project would lead to improved water supply reliability for 45,522 customers served by CWA.

DAC Status

The majority of CWA's service area is designated as a SDAC, as shown in Attachment 5, consisting of predominantly Hispanic, Spanish-speaking communities with a median household income of $36,124 and a child poverty rate of 40%. Additionally, approximately 12.7% of Coachella residents are unemployed, which ranks as the highest unemployment rate in the County of Riverside.

The Project directly serves the water needs of SDACs in the City of Coachella. There are SWSs that rely on unreliable private groundwater wells that sometimes do not meet drinking water quality standards. By drilling a new well to increase supply, CWA will be able to serve new SWS consolidations and provide a high quality, reliable water supply for the residents of these small SDACs. While the lack of permanent, dedicated water supplies and lack of redundancy put the residents of each of the SWSs at risk, as SDACs, the residents of each SWS do not have the resources to pursue additional sources of supply independently. Extended droughts as a result of climate change would impact them further by reducing groundwater storage and concentrating contaminants that are already in exceedance of MCLs. It is critical that CWA increase water supply capacity within its system so that it

can continue to serve these small DACs and existing customers within its service area a reliable water supply even during times of drought.

Work Plan

A Work Plan for the CWA Groundwater Well project, including the anticipated tasks necessary to complete the project, the deliverables of the project, and the percent complete for each proposed task, is provided in **Table 2-4**.

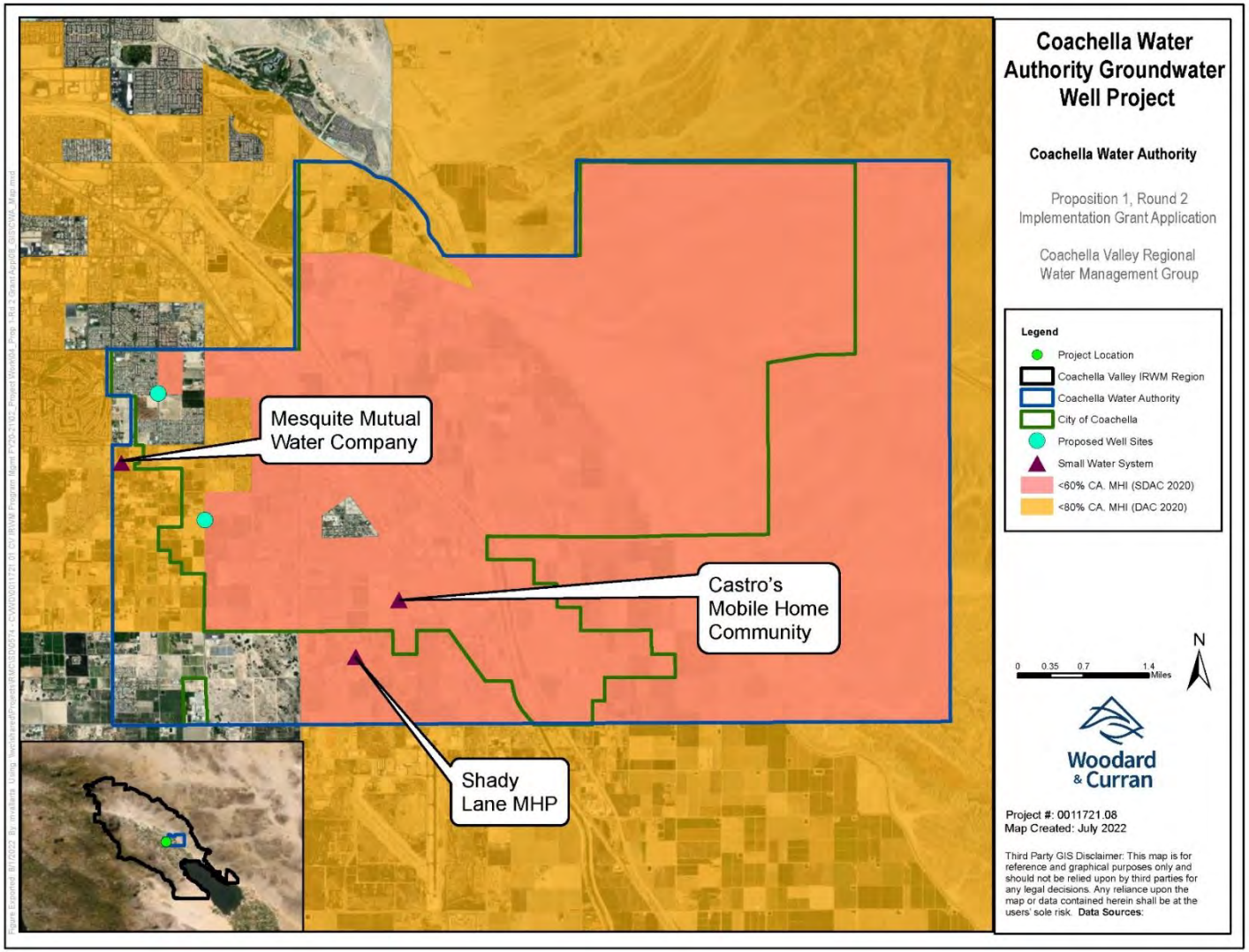
Table 2-4: Work Plan for CWA Groundwater Well project

Task and Description of Work to be Completed	Deliverables	%*
Budget Category (a): Project Administration		
1: Project Management – Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with IRWM regional manager. Prepare invoices including relevant supporting documentation for submittal to DWR via Grantee. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.	• Invoices and associated backup documentation	0%
2: Reporting – Prepare progress reports detailing work completed during reporting period as outlined in Exhibit F of the Agreement. Submit reports to DWR. Prepare Project Completion Report and submit to DWR no later than 90 days after project completion for DWR Project Manager's comment and review. The report shall be prepared and presented in accordance with guidance as outlined in Exhibit F.	• Quarterly Project Progress Reports • Project Completion Report • Documentation of "Acknowledgement of Credit & Signage" per Standard Condition D.2	0%
Budget Category (b): Land Purchase/Easement		
3: Land Purchase – No land to be purchased or easement(s) acquired. The groundwater well will be located at one of two CWA-owned sites to be determined during preliminary design.	• Not applicable	NA
Budget Category (c): Planning/Design/Engineering/Environmental Documentation		
4: Feasibility Studies – Preparation of a Well Siting Evaluation was completed in May 2017. No additional feasibility studies are required for this project.	• Complete	100%
5: CEQA Documentation – CEQA and the permitting processes for the Project are expected to be complete by January 2024. NEPA is not applicable. The Project is anticipated to be exempt from environmental review under CEQA under Class 3: New Construction (CEQA 15303). This Class 3 exemption allows for the construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure; the Project consists of the construction of a well on a CWA-owned parcel. Prepare and file the Notice of Exemption with the County of Riverside and State Clearinghouse prior to construction.	• Notice of Exemption • Legal Challenges Letter	0%
6: Permitting – The following permits are anticipated to be acquired for this project by January 2024: • Permit to Construct, SCAQMD • Fugitive Dust Control Plan, SCAQMD • General Permit for Stormwater Discharge, SWRCB	• Permits as required	0%

Task and Description of Work to be Completed	Deliverables	%*
• General Permit for Construction Discharges, RWQCB The permits will be identified during the design process. CWA will acquire all necessary permits prior to the start of construction and operation.		
7: Design – Planning for the Project began in January 2017 with the preparation of a Well Siting Evaluation (see Task 4). Design for the Project is expected to begin upon receipt of State grant funding in January 2023 and be complete by January 2024. CWA will hire a consultant to prepare 30%, 60%, 90% and Final plans and specifications for the project. During the preliminary design phase, CWA and its consultant will select the site based on the Well Siting Evaluation previously completed.	• Basis of Design Report • 100% Design Plans and Specifications	0%
8: Project Monitoring Plan – Develop and submit a Project Monitoring Plan per Paragraph 16 for DWR's review and approval.	• Project Monitoring Plan	0%
Budget Category (d): Construction/Implementation		
9: Contract Services – This task will comply with the Standard Condition D.11 – Competitive Bidding and Procurements. Activities necessary (as applicable) to secure a contractor and award the contract, including develop bid documents, prepare advertisement and contract documents for construction contract bidding, conduct pre-bid meeting, bid opening and evaluation, selection of the contractor, award of contract, and issuance of notice to proceed. Following the completion of design, CEQA, and permit acquisition, CWA will conduct the bid process to retain a contractor to construct the new groundwater well at one of two sites, both of which are currently owned by CWA. The construction contracting process is expected to take approximately three months.	• Bid Documents • Proof of Advertisement • Award of Contract • Notice to Proceed	0%
10. Construction Administration – This task includes managing contractor submittal review, answering requests for information, and issuing work directives. A full-time engineering construction observer will be on site for the duration of the project. Construction observer duties include documenting of pre-construction conditions, daily construction diary, preparing change orders, addressing questions of contractors on site, reviewing/updating project schedule, reviewing contractor log submittals and pay requests, forecasting cash flow, notifying contractor if work is not acceptable. Upon completing the project, the DWR Certificate of Project Completion and record drawings will be provided to DWR.	• Construction Management Contract • Inspection Reports • Submittal Log • Payment Requests • DWR Certificate of Project Completion • Record Drawings	0%
11. Construction/Implementation Activities – Construction activities are outlined below.		
Subtask 11(a): Mobilization and Demobilization **–** Mobilization and demobilization activities, including: preparing, submitting, and responding to submittals; all contractor administrative requirements (e.g., bonds, insurance); site cleanup and site restoration (e.g., final grading, landscaping, touch-up paint); furnishing all documentation (warranties, manuals, Standard Operating Procedure); and removal of all temporary facilities. *Subtask 11(b): Site Preparation* **–** Site preparation activities, including: setting up temporary facilities (e.g. field office, construction barriers). *Subtask 11(c): Installation, Construction, and Excavation* Construction will consist of drilling, testing, casing, and developing an approximately 2,200-gallon per minute (gpm) groundwater well that will be approximately 1,300 feet deep with an approximately 18-inch diameter casing and screen. The exact depth and casing diamter will be determined during the design and implementation process. The Project will also construct the well manifold	• Photographic Documentation of Progress • Engineers Certification • Performance testing results	0%

Task and Description of Work to be Completed	Deliverables	%*
piping, pump house, electrical building, installation of the electrical motor control center, hydropneumatic tank, emergency backup generator, chlorination equipment, site grading, other related aboveground and underground appurtenances, and connection to CWA's existing domestic water distribution system. Based on local knowledge and experience drilling wells in the Coachella Valley, it is estimated the construction duration will be approximately 18 months.		
** The right-hand column displays % complete for each task.*		

Figure 2-4: CWA Groundwater Well Project Map



Project 5: Polanco Septic Rehabilitation Program

Implementing Agency

Local Project Sponsor: Pueblo Unido Community Development Corporation (PUCDC)
Partners: Riverside County Building and Safety Department and Riverside County Environmental Health Department

Project Description

The Coachella Valley DAC Outreach Program, completed in 2013, included a comprehensive outreach and involvement program to identify DAC needs throughout the Coachella Valley. Through this effort, community residents, non-profits and government entities identified issues with onsite septic systems, especially those within the eastern Coachella Valley (East Valley) as major issues. Specifically, stakeholders indicated that low infiltration rates and under-sized systems could lead to public health issues associated with surfacing wastewater. The DAC Outreach Program recommended comprehensive re-design and re-sizing of septic systems to ensure that these systems could handle the volume of wastewater produced by residents. Aging or failing septic systems that result in surfacing wastewater have been cited as a serious public health concern and a potential source of water quality constituents such as bacteria and nitrates in the groundwater and surface water. Surfacing wastewater due to septic failure results in a potential public health threat due to the potential for direct human contact with inadequately treated sewage. Inadequately treated septic flows to groundwater can result in contaminated drinking water, as many residents in this DAC area still rely on shallow groundwater for drinking. Surfacing flows can also lead to runoff of bacteria and solids directly into the local waterways and ultimately to the Salton Sea, which is a source of recreation in the valley. Due to the importance of public health and local groundwater quality throughout the Coachella Valley, there is a need to rehabilitate or replace aging or failing septic systems to protect local residents and the Region's groundwater supplies and prevent constituents of concern from entering the Coachella Valley Stormwater Channel and the Salton Sea in areas where failing septic systems are located in the shallow groundwater aquifer. Through a Prop 84 Round 4 IRWM grant, CVWD issued 10 rebates to repair and rehabilitate septic systems that served 94 connections in the East Valley.

This application is to rehabilitate or replace 10 failing septic systems at 2 Mobile Home Parks (MHPs) in the East Valley. As the rebate program was difficult for DAC customers to access due to the upfront costs, PUCDC will be the grantee and will help facilitate the outreach and rehabilitation of these septic systems.

Using the existing Technical Assistance model for our infrastructure projects, PUCDC will assist families with onsite improvements which include septic rehabilitation. The scope of work includes:

1. Outreach, Training and Education: PUCDC will work with farmworker families to explain the onsite improvement process from the different aspects of project development. This includes information on best practices for onsite water supply and onsite waste management.
2. Planning and Design: PUCDC will coordinate work with local consultants including retaining services for civil and geotechnical engineering for the septic design and soils reports as well as initiating coordination with the local permit agencies to obtain required permits.
3. Implementation: PUCDC will coordinate obtaining bids from general contractors and vendors and oversee construction of septic systems. This includes coordination of final inspections with local government agencies.

Quantitative Benefits	
Groundwater Quality. The project will reduce approximately 800[1] pounds per year of total suspended solids (TSS) to groundwater.	**Water Quality.** The project will reduce approximately 800 pounds per year of TSS that could leech into irrigation channels and other surface water bodies including the Salton Sea.

[1] Calculation assumes 45 people will be served by the 10 new septic systems, each person uses 66.9 gallons of wastewater per day, and the concentration of TSS in wastewater is 83 mg/L.

DAC Status

The East Valley area in which these 2 MHPs are located is within a 100% SDAC area. This application is to rehabilitate or replace 10 failing septic systems at the 2 MHPs in the East Valley. As the rebate program was difficult for DAC customers to access due to the upfront costs, PUCDC will be the grantee and will help facilitate the outreach and installation of these septic systems.

Work Plan

A Work Plan for the Polanco Septic Rehabilitation Program, including the anticipated tasks necessary to complete the project, the deliverables of the project, and the percent complete for each proposed task, is provided in **Table 2-5**.

Table 2-5: Work Plan for the Polanco Septic Rehabilitation Program

Task and Description of Work to be Completed	Deliverables	%*
Budget Category (a): Project Administration		
1: Project Management – Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with IRWM regional manager. Prepare invoices including relevant supporting documentation for submittal to DWR via Grantee. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors.	• Invoices and associated backup documentation	0%
2: Reporting – Prepare progress reports detailing work completed during reporting period as outlined in Exhibit F of the Agreement. Submit reports to DWR. Prepare Project Completion Report and submit to DWR no later than 90 days after project completion for DWR Project Manager's comment and review. The report shall be prepared and presented in accordance with guidance as outlined in Exhibit F.	• Quarterly Project Progress Reports • Project Completion Report • Documentation of "Acknowledgement of Credit & Signage" per Standard Condition D.2	0%
Budget Category (b): Land Purchase/Easement		
3: Land Purchase – Land purchase or easement(s) is not needed. The project is located at 2 MHPs within the designated DAC area, which includes the unincorporated communities of Thermal, Oasis, and Mecca, Riverside County.	• Not applicable	NA
Budget Category (c): Planning/Design/Engineering/Environmental Documentation		
4: Feasibility Studies – The 2013 DAC Outreach Program was completed.	• Complete	100%
5: CEQA Documentation – Replacement of septic systems in place at these MHPs is CEQA exempt under Class 2: Replacement or Reconstruction (CEQA 15302). A Notice of Exemption will be filed.	• Notice of Exemption • Legal Challenges Letter	0%
6: Permitting –Work in coordination with the Riverside County Building and Safety and Environmental Health Departments to obtain required permits. Riverside County DEH requirements are listed on their website: https://www.rivcoeh.org/OurServices/LandDevelopment/SepticSystems Each septic system will require a • Building permit • Percolation report • Floor plan • Documentation of water service.	• Permits as required	0%

Task and Description of Work to be Completed	Deliverables	%*
7: Design – Coordinate work with local consultants including retaining services for civil and geotechnical engineering for the septic design and soils reports. Prepare 100% design plans and specifications for the septic rehabilitations.	• Basis of Design Report • 100% Design Plans and Specifications	0%
8: Project Monitoring Plan – Develop and submit a Project Monitoring Plan per Paragraph 16 for DWR's review and approval.	• Project Monitoring Plan	0%
Budget Category (d): Construction/Implementation		
9: Contract Services – This task will comply with the Standard Condition D.11 – Competitive Bidding and Procurements. Activities necessary (as applicable) to secure a contractor and award the contract, including develop bid documents, prepare advertisement and contract documents for construction contract bidding, conduct pre-bid meeting, bid opening and evaluation, selection of the contractor, award of contract, and issuance of notice to proceed. Coordinate obtaining bids from general contractors and vendors.	• Bid Documents • Proof of Advertisement • Award of Contract • Notice to Proceed	0%
10. Construction Administration – This task includes managing contractor submittal review, answering requests for information, and issuing work directives. A full-time engineering construction observer will be on site for the duration of the project. Construction observer duties include documenting of pre-construction conditions, daily construction diary, preparing change orders, addressing questions of contractors on site, reviewing/updating project schedule, reviewing contractor log submittals and pay requests, forecasting cash flow, notifying contractor if work is not acceptable. Upon completing the project, the DWR Certificate of Project Completion and record drawings will be provided to DWR.	• Construction Management Contract • Inspection Reports • Submittal Log • Payment Requests • DWR Certificate of Project Completion • Record Drawings	0%
11. Construction/Implementation Activities – Construction activities are outlined below.		
Subtask 11(a): Construction of Septic Systems – Oversee of septic systems rehabilitation. This includes inspection of the existing facility, repair or replacement work, abandonment as needed), trenching, on-site plumbing, and inspection along with coordination of final inspections with local government agencies.	• Photographic Documentation of Progress • Engineers Certification • Performance testing results	0%
** The right-hand column displays % complete for each task.*		

Figure 2-5: Polanco Septic Rehabilitation Program Map – Campos MHP

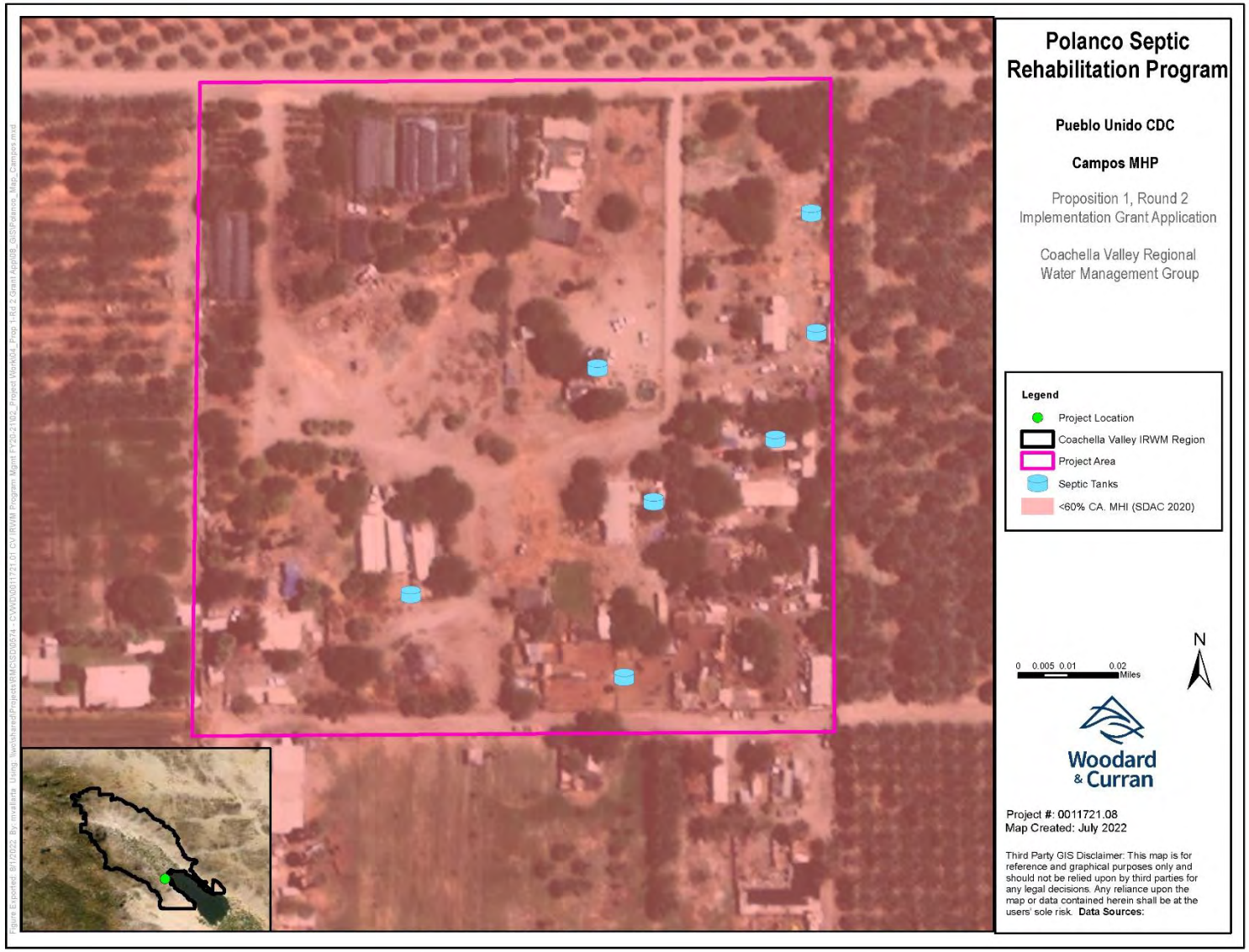
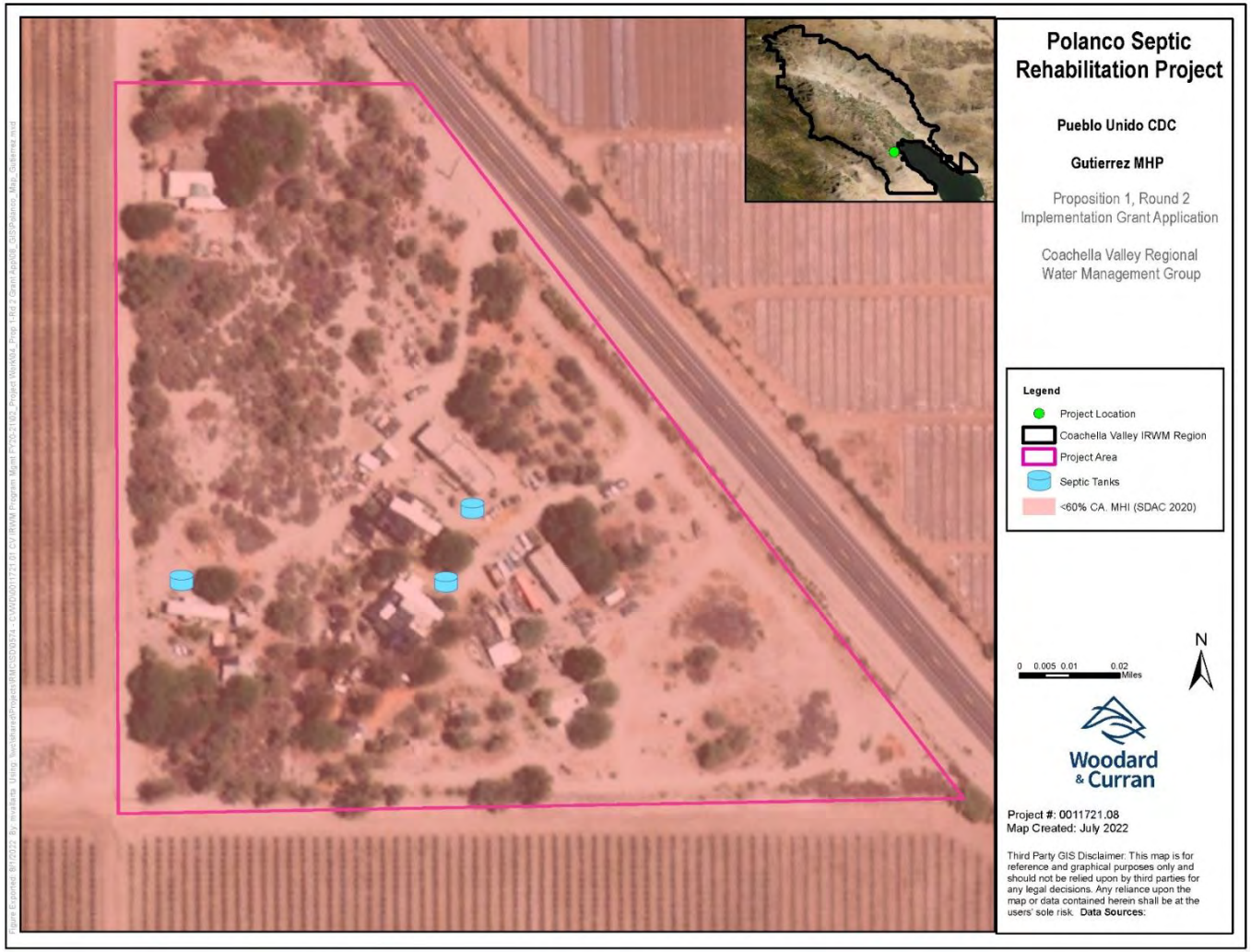


Figure 2-6: Polanco Septic Rehabilitation Program Map – Gutierrez MHP



Project 6: Sunrise Park Recycled Water Connection

Implementing Agency

Local Project Sponsor: Desert Water Agency (DWA)
Partners: City of Palm Springs, Mizell Senior Center, and Boys & Girls Club of Palm Springs

Project Description

In mid-2020, DWA's largest recycled water customer dropped offline with no advanced warning. DWA's recycled water plant is now operating at a reduced capacity and more wastewater is being percolated rather than tertiary treated and delivered to irrigation customers. This presents operational and financial challenges to DWA's recycled water operations. DWA is exploring new, cost-effective connections to its system, but given that it is not the sewer provider in the City of Palm Springs, it is limited in how to pay for recycled water system improvements.

The City of Palm Springs has long been interested in connecting Sunrise Park to recycled water but hasn't had the resources to pay for the system extension. Connecting this area, with roughly 1,000,000 square feet of grass, to non-potable would reduce groundwater demand, improve water quality, and reduce costs for local taxpayers. It would also make the park more drought resistant given that many restrictions during drought apply to potable water.

Sunrise Park is home to Mizell Senior Center and Boys & Girls Club of Palm Springs, as well as the Palm Springs Library and Palm Springs Stadium. The Boys & Girls Club of Palm Springs is a nonprofit organization, providing a wide range of after school, summer, and winter programs in a safe and supervised environment for over 1,700 children. The Mizell Center is a non-denominational organization that has been serving the senior community in the greater Palm Springs area since 1974. By serving the irrigation needs of Sunrise Park, the project will ensure that these organizations have a dedicated space to provide recreational activities for communities.

This project includes the addition of a booster station, roughly 4,000 lineal feet of 8-inch recycled water pipe and some onsite connection retrofits for 11 services. The capacity at the existing water recycling plant is sufficient to handle the additional demand so no upgrades are necessary at that facility as a result of this project.

Quantitative Benefits	
Water Supply – Recycled Water. The project will result in a reduction in a recycled water supply of 199 acre-feet per year.	**Water Savings.** The project will result in a reduction in groundwater pumping of 199 acre-feet per year. DWA used a three-year average of water use at Sunrise Park to estimate water savings from conversion to recycled water.

DAC Status

This project would extend DWA's recycled water pipe system to serve irrigation needs at Sunrise Park with roughly 1,000,000 square feet of grass. DAC residents rely more heavily on community resources like public parks for recreation. Additionally, water quality would be improved in a DAC area adjacent to where wastewater percolation currently occurs (Agua Caliente Band of Cahuilla Indian reservation), and costs borne by DAC residents would be reduced.

Work Plan

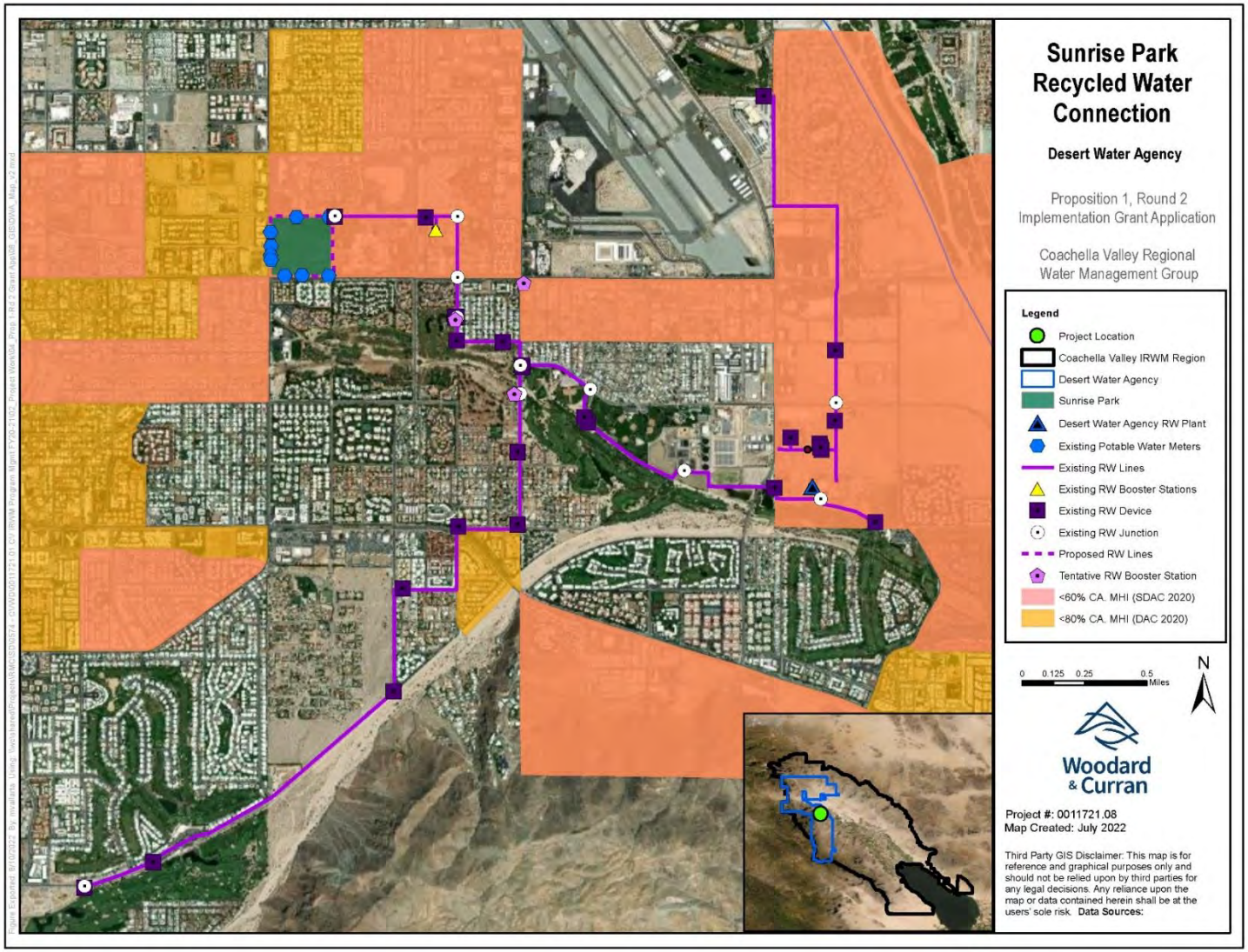
A Work Plan for the Sunrise Park Recycled Water Connection project, including the anticipated tasks necessary to complete the project, the deliverables of the project, and the percent complete for each proposed task, is provided in **Table 2-6.**

Table 2-6: Work Plan for the Sunrise Park Recycled Water Connection Project

Task and Description of Work to be Completed	Deliverables	%*
Budget Category (a): Project Administration		
1: Project Management – Manage Grant Agreement including compliance with grant requirements, and preparation and submission of supporting grant documents and coordination with IRWM regional manager. Prepare invoices including relevant supporting documentation for submittal to DWR via Grantee. This task also includes administrative responsibilities associated with the project such as coordinating with partnering agencies and managing consultants/contractors. Coordinate with City of Palm Springs regarding onsite plumbing retrofits and invoices, compile DWA invoices for material, contracts and labor related to construction and share materials with CVWD for DWR invoicing.	• Invoices and associated backup documentation	0%
2: Reporting – Prepare progress reports detailing work completed during reporting period as outlined in Exhibit F of the Agreement. Submit reports to DWR. Prepare Project Completion Report and submit to DWR no later than 90 days after project completion for DWR Project Manager's comment and review. The report shall be prepared and presented in accordance with guidance as outlined in Exhibit F. Coordinate with City of Palm Springs on progress for onsite plumbing retrofits, recycled water permit and coordinate with DWA project manager and contractors on project status and milestones.	• Quarterly Project Progress Reports • Project Completion Report • Documentation of "Acknowledgement of Credit & Signage" per Standard Condition D.2	0%
Budget Category (b): Land Purchase/Easement		
3: Land Purchase – Determine site requirements for the booster station. Identify possible parcels for purchase if DWA does not own an ideal site. Commission an appraisal, if necessary. Get Board of Directors approval for land purchase, if necessary. Complete escrow for land acquisition, if necessary.	• Documentation supporting property value (if purchased) • All relevant documentation regarding property ownership, transfer, or acquisition of easement, including final recorded deed, title report, etc.	10%
Budget Category (c): Planning/Design/Engineering/Environmental Documentation		
4: Feasibility Studies – No feasibility studies were completed as part of the project development process.	• Not applicable.	N/A
5: CEQA Documentation – Connection of Sunrise Park to DWA's recycled water system will require minor utility extensions, which is exempt from CEQA under Class 3: New Construction (CEQA 15303). A Notice of Exemption is to be filed.	• Notice of Exemption • Legal Challenges Letter	0%
6: Permitting – Apply to Regional Water Quality Control Board for a permit for use of recycled water at this site.	• Permit for use of recycled water at site	0%
7: Design – Complete engineering design for pipeline extension and booster station and plans for onsite retrofits. Prepare and complete 100% design drawings and specifications.	• Basis of Design Report • 100% Design Plans and Specifications	0%

Task and Description of Work to be Completed	Deliverables	%*
8: Project Monitoring Plan – Develop and submit a Project Monitoring Plan per Paragraph 16 for DWR's review and approval.	• Project Monitoring Plan	0%
Budget Category (d): Construction/Implementation		
9: Contract Services – This task will comply with the Standard Condition D.11 – Competitive Bidding and Procurements. Activities necessary (as applicable) to secure a contractor and award the contract, including develop bid documents, prepare advertisement and contract documents for construction contract bidding, conduct pre-bid meeting, bid opening and evaluation, selection of the contractor, award of contract, and issuance of notice to proceed. DWA to prepare bid documents for pipeline extension and booster station, advertise for submissions, review bids, take selected bid(s) to Board of Directors for approval. City of Palm Springs to prepare bid documents for necessary onsite plumbing retrofits, advertise for submissions, review bids, take selected bid(s) to City Council for approval.	• Bid Documents • Proof of Advertisement • Award of Contract • Notice to Proceed	0%
10. Construction Administration – This task includes managing contractor submittal review, answering requests for information, and issuing work directives. A full-time inspector will be on site for the duration of the project. Inspector duties include documenting of pre-construction conditions, daily construction diary, preparing change orders, addressing questions of contractors on site, reviewing/updating project schedule, reviewing contractor log submittals and pay requests, forecasting cash flow, notifying contractor if work is not acceptable. Upon completing the project, the DWR Certificate of Project Completion and record drawings will be provided to DWR. Oversee construction schedule, coordinate public notifications on project traffic and noise impacts, have an inspector onsite, manage contractor payments.	• Construction Management Contract • Inspection Reports • Submittal Log • Payment Requests • DWR Certificate of Project Completion • Record Drawings	0%
11. Construction/Implementation Activities – Construction activities are outlined below.		
Subtask 11(a): Mobilization and demobilization activities, including: preparing, submitting, and responding to submittals; all contractor administrative requirements (e.g., bonds, insurance); site cleanup and site restoration (e.g., final grading, landscaping, touch-up paint); furnishing all documentation (warranties, manuals, Standard Operating Procedure); and removal of all temporary facilities. *Subtask 11(b): Site Preparation* **–** Site preparation activities, including: setting up temporary facilities (e.g. field office, construction barriers). *Subtask 11(c): Installation, Construction, and Excavation* **–** Construction activities include the construction of roughly 4,000 lineal feet of pipeline, retrofit existing onsite plumbing to prepare for transition to recycled water, eliminate mixed-use meters, and build and connect booster station.	• Photographic Documentation of Progress • Engineers Certification • Performance testing results	0%
** The right-hand column displays % complete for each task.*		

Figure 2-7: Sunrise Park Recycled Water Connection Project Map



Grant Administration

Implementing Agency

Implementing Agency: Coachella Valley Water District (CVWD)
Partners: Local project sponsors (DWA, MSWD, CWA, and PUCDC)

Project Description

CVWD (Grantee) is the applicant for the 2022 IRWM Implementation Grant Proposal and will be responsible for contracting with DWR, contracting with local project sponsors (LPS), submitting all invoices, progress reports, and deliverables to DWR on behalf of LPS, ensuring compliance with all grant requirements, and coordinating with DWR and LPS. CVWD has served as the grant administrator and has been awarded and managed several IRWM grant programs since 2010 including: Proposition 1 IRWM Grants (Planning Grant and Disadvantaged Community Involvement Grant, and Implementation Grant), Proposition 84 IRWM Implementation Grants (Round 1, Round 2, Drought Round, and Final Round), and Proposition 84 IRWM Planning Grant.

The Grantee will administer the funds and respond to DWR's reporting and compliance requirements associated with the grant administration. The Grantee will act in a coordination role: disseminating grant compliance information to the project managers responsible for implementing the projects contained in this agreement, obtaining and retaining evidence of compliance (e.g., CEQA/NEPA documents, reports, monitoring compliance documents, labor requirements, etc.), obtaining data for progress reports from individual project managers, assembling and submitting progress reports to the State, and coordinating all invoicing and payment of invoices.

Proposed Tasks

A Work Plan for the *Grant Administration*, including the anticipated tasks necessary to complete the project and deliverables of the project, is provided in **Table 2-7.**

Table 2-7: Work Plan for *Grant Administration*

Task and Description of Work to be Completed	Deliverables	% Complete
Budget Category (a): Project Administration		
1. Agreement Administration – The Grantee will respond to DWR's reporting and compliance requirements associated with the grant administration and will coordinate with the project managers responsible for implementing the projects contained in this agreement.	• Executed Grant Agreement	0%
2. Invoicing – The Grantee will be responsible for compiling invoices for submittal to DWR. This includes collecting invoice documentation from each of the Local Project Sponsors and compiling the information into a DWR Invoice Packet.	• Quarterly Invoices and associated backup documentation	0%
3. Reporting – The Grantee will be responsible for compiling progress reports for submittal to DWR. The Grantee will coordinate with Local Project Sponsor staff to retain consultants as needed to prepare and submit progress reports and final project completion reports for each project, as well as the grant completion report. Reports will meet generally accepted professional standards for technical reporting and the requirements terms of the contract with DWR outlined in Exhibit F of this Agreement.	• Quarterly Progress Reports • Grant Completion Report	0%

Attachment

3

Coachella Valley Integrated Regional Water Management

2022 IRWM Implementation Grant Proposal

Budget

Attachment 3 consists of the following items:

- ✓ **Budget.** This attachment includes an estimated capital cost to complete each project in the Proposal.

Contents

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Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project 4

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Agreement Budget Summary

A Project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-1** for the 2022 IRWM Implementation Proposal, based on current available information.

Table 3-1: Grand Total Project Budget for Proposal

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
Project 1: Reservoirs 4711-3 and 4711-4 Project	$850,000	$3,550,000	$0	$4,400,000
Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project	$812,755	$812,755	$0	$1,625,510
Project 3: Groundwater Quality Projection Project – Area D-3	$875,000	$875,000	$245,000	$1,995,000
Project 4: CWA Groundwater Well Project	$750,000	$0	$3,145,291	$3,895,291
Project 5: Polanco Septic Rehabilitation Project	$300,000	$0	$0	$300,000
Project 6: Sunrise Park Recycled Water Connection	$500,000	$500,000	$41,000	$1,041,000
Grant Administration	$25,000	$0	$0	$25,000
GRAND TOTAL	**$4,112,755**	**$5,737,755**	**$3,431,291**	**$13,281,801**

Project 1: Reservoirs 4711-3 and 4711-4 Project

Local Project Sponsor: Coachella Valley Water District (CVWD)
Partners: Riverside County Fire Department and Indio Hills Community Council

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-2** for the Reservoirs 4711-3 and 4711-4 Project, based on current available information.

Table 3-2: Total Project Budget for the Reservoirs 4711-3 and 4711-4 Project

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration	**$0**	**$50,000**	**$0**	**$50,000**
Task 1: Project Management	$0	$25,000	$0	$25,000
Task 2: Reporting	$0	$25,000	$0	$25,000
(b) Land Purchase/Easement	**$0**	**$0**	**$0**	**$0**
Task 3: Land Purchase	$0	$0	$0	$0
(c) Planning/Design/Engineering/Environmental Documentation	**$0**	**$70,000**	**$0**	**$70,000**
Task 4: Feasibility Studies	$0	$0	$0	$0
Task 5: CEQA Documentation	$0	$0	$0	$0
Task 6: Permitting	$0	$0	LPS	$0
Task 7: Design	$0	$70,000	$0	$70,000
Task 8: Project Monitoring Plan	$0	$0	LPS	$0
(d) Construction/Implementation	**$850,000**	**$3,430,000**	**$0**	**$4,280,000**
Task 9: Contract Services	$10,000	$0	$0	$10,000
Task 10: Construction Administration	$80,000	$0	$0	$80,000
Task 11: Construction	$760,000	$3,430,000	$0	$4,190,000
TOTAL COSTS	**$850,000**	**$3,550,000**	**$0**	**$4,400,000**

***List fund source(s):** CVWD Domestic Water Fund
LPS: Indicates the LPS will absorb costs associated with this task.
****List sources of Other Cost Share, including other State Fund Sources:** CVWD Capital Improvement Budget
LPS: Indicates the Local Project Sponsor (LPS) will absorb costs associated with this task.

Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project

Local Project Sponsor: Desert Water Agency (DWA)
Partners: CVWD, Coachella Water Authority, Indio Water Authority, and Mission Springs Water District

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-3** for the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project, based on current available information.

Table 3-3: Total Project Budget for the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration	**$0**	**$0**	**$0**	**$0**
Task 1: Project Management	$0	$0	$0	$0
Task 2: Reporting	$0	$0	$0	$0
(b) Land Purchase/Easement	**$0**	**$0**	**$0**	**$0**
Task 3: Land Purchase	$0	$0	$0	$0
(c) Planning/Design/Engineering/Environmental Documentation	**$0**	**$0**	**$0**	**$0**
Task 4: Feasibility Studies	$0	$0	$0	$0
Task 5: CEQA Documentation	$0	$0	LPS	$0
Task 6: Permitting	$0	$0	$0	$0
Task 7: Design	$0	$0	$0	$0
Task 8: Project Monitoring Plan	$0	$0	$0	$0
(d) Construction/Implementation	**$812,755**	**$812,755**	**$0**	**$1,625,510**
Task 9: Contract Services	$0	$0	$0	$0
Task 10: Construction Administration	$0	$0	$0	$0
Task 11: Construction	$812,755	$812,755	$0	$1,625,510
TOTAL COSTS	**$812,755**	**$812,755**	**$0**	**$1,625,510**

***List fund source(s):** Matching funds will be with customer spend, federal funds and/or from participating agency budgets. Agency match could be included if cost share is required at 50%.
****List sources of Other Cost Share, including other State Fund Sources:** CVIRWM agency conservation program budgets.
LPS: Indicates the LPS will absorb costs associated with this task.

Project 3: Groundwater Quality Protection Project – Area D-3

Local Project Sponsor: Mission Springs Water District (MSWD)
Partners: City of Desert Hot Springs and Colorado River Basin Regional Water Quality Control Board

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-4** for the Groundwater Quality Protection Project – Area D-3, based on current available information.

Table 3-4: Total Project Budget for the Groundwater Quality Protection Project – Area D-3

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration	**$0**	**$0**	**$12,000**	**$12,000**
Task 1: Project Management	$0	$0	$6,000	$6,000
Task 2: Reporting	$0	$0	$6,000	$6,000
(b) Land Purchase/Easement	**$0**	**$0**	**$0**	**$0**
Task 3: Land Purchase	$0	$0	$0	$0
(c) Planning/Design/Engineering/Environmental Documentation	**$0**	**$0**	**$39,500**	**$39,500**
Task 4: Feasibility Studies	$0	$0	LPS	$0
Task 5: CEQA Documentation	$0	$0	$10,000	$10,000
Task 6: Permitting	$0	$0	$2,500	$2,500
Task 7: Design	$0	$0	$25,000	$25,000
Task 8: Project Monitoring Plan	$0	$0	$2,000	$2,000
(d) Construction/Implementation	**$875,000**	**$875,000**	**$193,500**	**$1,943,500**
Task 9: Contract Services	$0	$0	$10,000	$10,000
Task 10: Construction Administration	$0	$0	$183,500	$183,500
Task 11: Construction	$875,000	$875,000	$0	$1,750,000
TOTAL COSTS	**$875,000**	**$875,000**	**$245,000**	**$1,995,000**

***List fund source(s):** Assessment District 18 proceeds.
****List sources of Other Cost Share, including other State Fund Sources:** Additional local assessment district and sewer improvement funds.
LPS: Indicates the LPS will absorb costs associated with this task.

Project 4: Coachella Water Authority Groundwater Well Project

Local Project Sponsor: Coachella Water Authority (CWA)
Partners: None

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-5** for the CWA Groundwater Well Project, based on current available information.

Table 3-5: Total Project Budget for the CWA Groundwater Well Project

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration	**$0**	**$0**	**$40,000**	**$40,000**
Task 1: Project Management	$0	$0	$20,000	$20,000
Task 2: Reporting	$0	$0	$20,000	$20,000
(b) Land Purchase/Easement	**$0**	**$0**	**$0**	**$0**
Task 3: Land Purchase	$0	$0	$0	$0
(c) Planning/Design/Engineering/Environmental Documentation	**$0**	**$0**	**$100,000**	**$100,000**
Task 4: Feasibility Studies	$0	$0	$0	$0
Task 5: CEQA Documentation	$0	$0	LPS	$0
Task 6: Permitting	$0	$0	LPS	$0
Task 7: Design	$0	$0	$100,000	$100,000
Task 8: Project Monitoring Plan	$0	$0	LPS	$0
(d) Construction/Implementation	**$750,000**	**$0**	**$3,005,291**	**$3,755,291**
Task 9: Contract Services	$0	$0	$20,000	$20,000
Task 10: Construction Administration	$0	$0	$360,000	$360,000
Task 11: Construction	$750,000	$0	$2,625,291	$3,375,291
TOTAL COSTS	**$750,000**	**$0**	**$3,145,291**	**$3,895,291**

***List fund source(s):** CWA reserve funds and development impact fees.
****List sources of Other Cost Share, including other State Fund Sources:** N/A
LPS: Indicates the LPS will absorb costs associated with this task.

Project 5: Polanco Septic Rehabilitation Program

Local Project Sponsor: Pueblo Unido Community Development Corporation (PUCDC)
Partners: Riverside County Building and Safety Department and Riverside County Environmental Health Department

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-6** for the Polanco Septic Rehabilitation Program, based on current available information.

Table 3-6: Total Project Budget for the Polanco Septic Rehabilitation Program

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration	**$17,250**	**$0**	**$0**	**$17,250**
Task 1: Project Management	$17,250	$0	$0	$17,250
Task 2: Reporting	$0	$0	LPS	$0
(b) Land Purchase/Easement	**$0**	**$0**	**$0**	**$0**
Task 3: Land Purchase	$0	$0	$0	$0
(c) Planning/Design/Engineering/Environmental Documentation	**$15,800**	**$0**	**$0**	**$15,800**
Task 4: Feasibility Studies	$0	$0	$0	$0
Task 5: CEQA Documentation	$0	$0	LPS	$0
Task 6: Permitting	$5,000	$0	LPS	$5,000
Task 7: Design	$10,800	$0	$0	$10,800
Task 8: Project Monitoring Plan	$0	$0	$0	$0
(d) Construction/Implementation	**$266,950**	**$0**	**$0**	**$266,950**
Task 9: Contract Services	$0	$0	$0	$0
Task 10: Construction Administration	$5,750	$0	$0	$5,750
Task 11: Construction	$261,200	$0	$0	$261,200
TOTAL COSTS	**$300,000**	**$0**	**$0**	**$300,000**

***List fund source(s):** NA
****List sources of Other Cost Share, including other State Fund Sources:** NA
LPS: Indicates the LPS will absorb costs associated with this task.

Project 6: Sunrise Park Recycled Water Connection

Local Project Sponsor: Desert Water Agency (DWA)
Partners: City of Palm Springs, Mizell Senior Center, and Boys & Girls Club of Palm Springs

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided as **Table 3-7** for the Sunrise Park Recycled Water Connection Project, based on current available information.

Table 3-7: Total Project Budget for the Sunrise Park Recycled Water Connection Project

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration	**$0**	**$30,000**	**$0**	**$30,000**
Task 1: Project Management	$0	$25,000	$0	$25,000
Task 2: Reporting	$0	$5,000	$0	$5,000
(b) Land Purchase/Easement	**$0**	**$0**	**$0**	**$0**
Task 3: Land Purchase	$0	$0	LPS	$0
(c) Planning/Design/Engineering/Environmental Documentation	**$0**	**$67,500**	**$6,000**	**$73,500**
Task 4: Feasibility Studies	$0	$0	$0	$0
Task 5: CEQA Documentation	$0	$0	$1,000	$1,000
Task 6: Permitting	$0	$0	$5,000	$5,000
Task 7: Design	$0	$65,000	$0	$65,000
Task 8: Project Monitoring Plan	$0	$2,500	$0	$2,500
(d) Construction/Implementation	**$500,000**	**$402,500**	**$35,000**	**$937,500**
Task 9: Contract Services	$0	$0	$10,000	$10,000
Task 10: Construction Administration	$0	$0	$25,000	$25,000
Task 11: Construction	$500,000	$402,500	$0	$902,500
TOTAL COSTS	**$500,000**	**$500,000**	**$41,000**	**$1,041,000**

***List fund source(s):** DWA and City of Palm Springs funds, possible federal funding.
****List sources of Other Cost Share, including other State Fund Sources:** DWA Capital Improvement budget.
LPS: Indicates the LPS will absorb costs associated with this task.

Grant Administration

Implementing Agency: Coachella Valley Water District (CVWD)
Partners: Local project sponsors, DWA, MSWD, CWA, and PUCDC.

A project summary budget table consistent with Exhibit C in the *2022 PSP* is provided below as **Table 3-8** for *Grant Administration*.

Table 3-8: Total Project Budget for *Grant Administration*

Activity	Grant Amount	Required Cost Share: Non-State Fund Source *	Other Cost Share **	Total Cost
(a) Project Administration				
Task 1: Agreement Administration	$5,000	$0	LPS	$5,000
Task 2: Invoicing	$10,000	$0	LPS	$10,000
Task 3: Reporting	$10,000	$0	LPS	$10,000
Project Total	**$25,000**	**$0**	**$0**	**$25,000**

***List fund source(s):** CVWD will provide additional grant administration as needed in excess of $25,000.
****List sources of Other Cost Share, including other State Fund Sources:** CVWD operating budget
LPS: Indicates the LPS will absorb costs associated with this task.

Attachment
4

Coachella Valley Integrated Regional Water Management
2022 IRWM Implementation Grant Proposal
Schedule

Attachment 4 consists of the following items:

- ✓ **Schedule.** This attachment includes the schedule for implementation of each project. Appendix 4-1 includes a master schedule of all projects included in the *2022 IRWM Implementation Grant Proposal*.

Contents

Project 1: Reservoirs 4711-3 and 4711-4 Project 2

Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project 3

Project 3: Groundwater Quality Protection Project – Area D-3 4

Project 4: Coachella Water Authority Groundwater Well Project 5

Project 5: Polanco Septic Rehabilitation Program 6

Project 6: Sunrise Park Recycled Water Connection 7

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Project 1: Reservoirs 4711-3 and 4711-4 Project

Local Project Sponsor: Coachella Valley Water District (CVWD)
Partners: Riverside County Fire Department and Indio Hills Community Council

Table 4-1 provides a summary of the schedule for the Reservoirs 4711-3 and 4711-4 Project. The project schedule described here is consistent with the Work Plan (Attachment 2) and Budget (Attachment 3). The schedule for the Project Monitoring Plan (Category (c)) will overlap with the schedules for the Construction/Implementation tasks (Category (d)).

Table 4-1: Schedule for the Reservoirs 4711-3 and 4711-4 Project

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Jun-26**
	Task 1: Project Management	Jan-23	Sep-25
	Task 2: Reporting	Jan-23	Jun-26
(b)	**Land Purchase/Easement**	**NA**	
	Task 3: Land Purchase	NA	
(c)	**Planning / Design / Engineering / Environmental Documentation**	**Jan-19**	**Jul-25**
	Task 4: Feasibility Studies	NA	NA
	Task 5: CEQA Documentation	Jan-19	Dec-22
	Task 6: Permitting	Jan-19	Mar- 23
	Task 7: Design	Jan-19	Jul-22
	Task 8: Project Monitoring Plan	Jan-23	Jul-25
(d)	**Construction/Implementation**	**Jul-23**	**Jul-25**
	Task 9: Contract Services	Jul-23	Oct-23
	Task 10: Construction Administration	Nov-23	Jul-25
	Task 11: Construction/Implementation Activities	Nov-23	Jul-25

Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project

Local Project Sponsor: Desert Water Agency (DWA)
Partners: Coachella Valley Water District, Coachella Water Authority, Indio Water Authority and Mission Springs Water District

Table 4-2 provides a summary of the schedule for the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project. The project schedule described here is consistent with the Work Plan (Attachment 2) and Budget (Attachment 3). The schedule for the Turf Removal Program Implementation (Category (d)) will overlap with the schedules for the Category (c) tasks.

Table 4-2: Schedule for the Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Jun-26**
	Task 1: Project Management	Jan-23	Dec-24
	Task 2: Reporting	Jan-23	Jun-26
(b)	**Land Purchase/Easement**	**NA**	
	Task 3: Land Purchase	NA	
(c)	**Planning / Design / Engineering / Environmental Documentation**	**Jan-23**	**Sep-23**
	Task 4: Feasibility Studies	NA	
	Task 5: CEQA Documentation	Aug-23	Sep-23
	Task 6: Permitting	Aug-23	Sep-23
	Task 7: Design	Mar-23	Sep-23
	Task 8: Project Monitoring Plan	Jan-23	May-23
(d)	**Construction/Implementation**	**Apr-23**	**Sep-24**
	Task 9: Contract Services	Oct-23	Dec-23
	Task 10: Construction Administration	Dec-23	Sep-24
	Task 11: Construction/Implementation Activities	Apr-23	Sep-24
	11(a): Turf Removal Program	*Jan-15*	*Mar-24*
	11(b): MSWD Demonstration Garden Construction	*Dec-23*	*Sep-24*

Project 3: Groundwater Quality Protection Project – Area D-3

Local Project Sponsor: Mission Springs Water District (MSWD)
Partners: City of Desert Hot Springs and Colorado River Basin Regional Water Quality Control Board

Table 4-3 provides a summary of the schedule for the Groundwater Quality Protection Project – Area D-3. The project schedule described here is consistent with the Work Plan (Attachment 2) and Budget (Attachment 3). The Permitting task (Category (c)) will be in progress during the Contract Services task (Category (d)) but will be complete by the time construction administration/implementation activities begin.

Table 4-3: Schedule for the Groundwater Quality Protection Project – Area D-3

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Jun-26**
	Task 1: Project Management	Jan-23	Sep-24
	Task 2: Reporting	Jan-23	Jun-26
(b)	**Land Purchase/Easement**	**NA**	
	Task 3: Land Purchase	NA	
(c)	**Planning / Design / Engineering / Environmental Documentation**	**Jan-23**	**Oct-23**
	Task 4: Feasibility Studies	Complete	
	Task 5: CEQA Documentation	Jan-23	Jun-23
	Task 6: Permitting	Jan-23	Oct-23
	Task 7: Design	Jan-23	Jun-23
	Task 8: Project Monitoring Plan	Jan-23	Jun-23
(d)	**Construction/Implementation**	**Jul-23**	**Sep-24**
	Task 9: Contract Services	Jul-23	Oct-23
	Task 10: Construction Administration	Nov-23	Sep-24
	Task 11: Construction/Implementation Activities	Nov-23	Jun-24
	11(a): Mobilization and Demobilization	Nov-23	Jun-24
	11(b): Pipeline Construction	Jan-24	Jun-24

Project 4: Coachella Water Authority Groundwater Well Project

Local Project Sponsor: Coachella Water Authority (CWA)
Partners: None

Table 4-4 provides a summary of the schedule for the CWA Groundwater Well Project. The project schedule described here is consistent with the Work Plan (Attachment 2) and Budget (Attachment 3).

Table 4-4: Schedule for the Coachella Water Authority Groundwater Well Project

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Jun-26**
	Task 1: Project Management	Jan-23	Dec-25
	Task 2: Reporting	Jan-23	Jun-26
(b)	**Land Purchase/Easement**	**NA**	
	Task 3: Land Purchase	NA	
(c)	**Planning / Design / Engineering / Environmental Documentation**	**Jan-17**	**Jan-24**
	Task 4: Feasibility Studies	Jan-17	May-17
	Task 5: CEQA Documentation	Jan-23	Jan-24
	Task 6: Permitting	Jan-23	Jan-24
	Task 7: Design	Jan-23	Jan-24
	Task 8: Project Monitoring Plan	Jun-23	Aug-23
(d)	**Construction/Implementation**	**Feb-24**	**Sep-25**
	Task 9: Contract Services	Feb-24	Apr-24
	Task 10: Construction Administration	May-24	Sep-25
	Task 11: Construction/Implementation Activities	May-24	Sep-25

Project 5: Polanco Septic Rehabilitation Program

Local Project Sponsor: Pueblo Unido Community Development Corporation (PUCDC)
Partners: Riverside County Building and Safety Department and Riverside County Environmental Health Department

Table 4-5 provides a summary of the schedule for the Polanco Septic Rehabilitation Program. The project schedule described here is consistent with the Work Plan (Attachment 2) and Budget (Attachment 3). The schedule for the Project Monitoring Plan (Category (c)) will overlap with the schedules for the Construction/Implementation tasks (Category (d)).

Table 4-5: Schedule for the Polanco Septic Rehabilitation Program

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Jun-26**
	Task 1: Project Management	Jan-23	Sep-23
	Task 2: Reporting	Jan-23	Jun-26
(b)	**Land Purchase/Easement**	**NA**	
	Task 3: Land Purchase	NA	
(c)	**Planning / Design / Engineering / Environmental Documentation**	**Jan-23**	**Jul-23**
	Task 4: Feasibility Studies	Complete	
	Task 5: CEQA Documentation	Jan-23	Jun-23
	Task 6: Permitting	Feb-23	Aug-23
	Task 7: Design	Jan-23	Feb-23
	Task 8: Project Monitoring Plan	Jan-23	Jul-23
(d)	**Construction/Implementation**	**Mar-23**	**Aug-23**
	Task 9: Contract Services	Mar-23	Apr-23
	Task 10: Construction Administration	May-23	Aug-23
	Task 11: Construction/Implementation Activities	May-23	May-24

Project 6: Sunrise Park Recycled Water Connection

Local Project Sponsor: Desert Water Agency (DWA)
Partners: City of Palm Springs, Mizell Senior Center, and Boys & Girls Club of Palm Springs

Table 4-6 provides a summary of the schedule for the Sunrise Park Recycled Water Connection Project. The project schedule described here is consistent with the Work Plan (Attachment 2) and Budget (Attachment 3). The Contract Services task (Category (d)) will begin one month prior to the completion of Tasks 4-7 under Category (c).

Table 4-6: Sunrise Park Recycled Water Connection

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Jun-26**
	Task 1: Project Management	Jan-23	Sep-26
	Task 2: Reporting	Jan-23	Jun-26
(b)	**Land Purchase/Easement**	**Feb-23**	**Dec-23**
	Task 3: Land Purchase	Jul-22	Dec-23
(c)	**Planning / Design / Engineering / Environmental Documentation**	**Jan-23**	**Feb-24**
	Task 4: Feasibility Studies	N/A	
	Task 5: CEQA Documentation	Feb-23	Feb-24
	Task 6: Permitting	Feb-23	Feb-24
	Task 7: Design	Feb-23	Feb-24
	Task 8: Project Monitoring Plan	Jan-23	Aug-23
(d)	**Construction/Implementation**	**Jan-24**	**Dec-25**
	Task 9: Contract Services	Jan-24	May-24
	Task 10: Construction Administration	Jun-24	Dec-25
	Task 11: Construction/Implementation Activities	Feb-25	Oct-25

Grant Administration

Implementing Agency: Coachella Valley Water District (CVWD)
Partners: Local project sponsors DWA, MSWD, CWA, PUCDC.

Grant Administration will be conducted by CVWD, as the authorized grantee from the Coachella Valley IRWM Region, from the assumed Grant Award Date of January 2023 through the assumed contract completion date of December 31, 2027. Grant administration ends at least three months after the completion of the last project**. Table 4-7** provides a summary of the schedule.

Table 4-7: Schedule for *Grant Administration*

Categories		Start Date	End Date
(a)	**Project Administration**	**Jan-23**	**Sep-26**
	Task 1: Agreement Administration	Jan-23	Sept-26
	Task 2: Invoicing	Jan-23	Sep-26
	Task 3: Reporting	Jan-23	Sep-26

Appendix 4-1: Coachella Valley IRWM Prop 1, Round 2 Master Schedule

	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
Project Administration																																																
Project 1: Reservoirs 4711-3 and 4711-4																																															
Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project																																															
Project 3: Groundwater Quality Project - Area D-3																																															
Project 4: Coachella Water Authority Groundwater Well Project																																															
Project 5: Polanco Septic Rehabilitation Project																																															
Project 6: Sunrise Park Recycled Water Connection																																															
Grant Administration																																															

	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
Land Purchase/Easement																																															
Project 1: Reservoirs 4711-3 and 4711-4 Project	N/A																																														
Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project	N/A																																														
Project 3: Groundwater Quality Project - Area D-3	N/A																																														
Project 4: Coachella Water Authority Groundwater Well Project	N/A																																														
Project 5: Polanco Septic Rehabilitation Project	N/A																																														
Project 6: Sunrise Park Recycled Water Connection*																																															

*Note: Project 6: Sunrise Park Recycled Water Connection began purchasing in July 2022.

	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
Planning/Design/Engineering/Environmental Documentation																																														
Project 1: Reservoirs 4711-3 and 4711-4 Project*																																															
Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project																																															
Project 3: Groundwater Quality Project - Area D-3																																															
Project 4: Coachella Water Authority Groundwater Well Project*																																															
Project 5: Polanco Septic Rehabilitation Project																																															
Project 6: Sunrise Park Recycled Water Connection																																															

*Note: Project 1: Reservoirs 4711-3 and 4711-4 Project began Planning/Design/Engineering/Environmental Documentation in January 2019, and Project 4: Coachella Water Authority Groundwater Well Project began Planning/Design/Engineering/Environmental Documentation in January 2017.

	Jan-23	Feb-23	Mar-23	Apr-23	May-23	Jun-23	Jul-23	Aug-23	Sep-23	Oct-23	Nov-23	Dec-23	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26	Sep-26	Oct-26	Nov-26	Dec-26
Construction/Implementation																																															
Project 1: Reservoirs 4711-3 and 4711-4 Project																																															
Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project																																															
Project 3: Groundwater Quality Project - Area D-3																																															
Project 4: Coachella Water Authority Groundwater Well Project																																															
Project 5: Polanco Septic Rehabilitation Project																																															
Project 6: Sunrise Park Recycled Water Connection																																															

Attachment
5

Coachella Valley Integrated Regional Water Management

2022 IRWM Implementation Grant Proposal

Disadvantaged Community

Attachment 5 consists of the following items:

- ✓ **Cost Share Waiver.** Identification of projects requesting a cost share waiver and justification for how the project addresses DAC needs and meets the definition of a DAC project.
- ✓ **Documentation of Coachella Valley's DACs.** Background on the presence and needs of DACs in the Coachella Valley IRWM region.
- ✓ **Project Benefits Provided to DACs.** Identification of DACs in Coachella Valley using the DWR DAC Mapping Tool and information how projects provide direct benefits to DACs.

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DAC Definition

As defined by Department of Water Resources (DWR), Disadvantaged Communities (DACs) are census geographies with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI. Severely Disadvantaged Communities (SDAC) are census geographies having less than 60% of the Statewide annual MHI. Data from the American Community Survey (ACS) of the U.S. Census for the years 2016-2020 shows:

- Statewide MHI: $78,672
- DAC (80% of Statewide MHI): $62,938
- SDAC (60% of Statewide MHI): $47,203

Areas mapped on DWR's DAC Mapping Tool (https://gis.water.ca.gov/app/dacs/) are considered DAC (see **Figure 5-1** below).

Cost Share Waiver

This proposal includes two requests for a funding match waiver:

- *Coachella Water Authority (CWA) Groundwater Well Project* is requesting a 50% cost share waiver. CWA's service area is 85% SDAC per DWR's DAC Mapping Tool. The project will benefit small water systems (SWSs) to address existing water supply challenges and build local resilience should drought conditions continue by ensuring small water systems can access a high-quality, reliable water supply.
- *Polanco Septic Rehabilitation Program* is requesting a 50% cost share waiver. The project area is in Eastern Coachella Valley. The two mobile home parks (MHPs) are located within a 100% SDAC area per the DWR DAC Mapping Tool. Rehabilitation of these 10 septic systems will reduce pollution loading of solids and bacteria to both shallow groundwater and to local surface waters, improving water quality and supply reliability.

Three other projects in this Proposal directly benefit DACs, but are not requesting a funding match waiver:

- *Reservoirs 4711-3 and 4711-4 Project* is NOT requesting a cost share waiver. The project will construct two new 1-million gallon above ground welded-steel tanks. The project area is in a 100% SDAC area per DWR's DAC Mapping Tool. The project will restore and improve water storage infrastructure, ensuring reliable and sustainable domestic water supply and fire flow protection.
- *Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project* is NOT requesting a cost share waiver. Turf rebates will be available to the combined service areas of the CVRWMG agencies, many of which qualify as DAC per DWR's DAC Mapping Tool.
- *Groundwater Quality Protection Project – Area D-3* is NOT requesting a cost share waiver. The project is located in a 100% DAC area per the DWR DAC Mapping Tool. The project will protect groundwater from untreated septic flows by abating 81 septic systems and ensuring future infill development of the 21 vacant lots immediately connected to the wastewater collection and treatment system.

One project in this Proposal indirectly benefits DACs and it not eligible for a funding match waiver:

- *Sunrise Park Recycled Water Connection Project* is NOT requesting a cost share waiver. While the project is in a SDAC area per the DWR DAC Mapping Tool, the project will not directly benefit DACs. The project will extend Desert Water Agency's (DWA's) recycled water pipe system to serve the irrigation needs at Sunrise Park, ensuring that DACs have access to open spaces and recreation activities.

Documentation of Presence and Needs of a DAC

DACs in the Coachella Valley IRWM Region were estimated through using the DWR DAC Mapping Tool, which is an interactive map that allows users to overlay US Census geographies (census place, census tracts, and census block group) over their project's area. Census tracts are small, relatively permanent geographic entities within counties delineated by a committee of local data users. Block groups are similar to census tracts, only a finer scale (i.e. block groups are nested within census tracts). The Coachella Valley IRWM Region boundary was uploaded to DWR's DAC Mapping Tool and compared to the American Community Survey 2016-2020 data. The map shows portions of the IRWM Region overlap with DAC/SDAC areas (**Figure 5-1).**

The CVRWMG and other organizations in the Coachella Valley have interacted and coordinated with DACs for many years. In 2007, the DAC Planning Group was formed regionally to track the progress of DAC programs under California's Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006 (Proposition 84). Since 2009, the CVRWMG agencies have engaged in targeted outreach to DACs. The DAC Outreach Program was implemented in 2012 to improve DAC participation in the Coachella Valley IRWM process and has continued to evolve to this day. The *2018 Coachella Valley Integrated Regional Water Management/Stormwater Resource (IRWM/SWR) Plan* and the *2020 Colorado River Funding Area (CRFA) Water Needs Assessment (Water Needs Assessment)* summarizes known water and wastewater needs of DACs and includes opportunities for future engagement and projects related to system consolidations, education, safe drinking water, and wastewater treatment.

Coachella Valley Water District (CVWD), together with stakeholders participating in CVWD's DAC Infrastructure Task Force, identified the need to expand on the 2014 demonstration project and developed a Domestic Water Consolidation Master Plan and a Sanitation Consolidation Master Plan – each outlines priority consolidation projects to link existing community water systems and sanitation systems to CVWD's municipal systems, which would provide these communities with safe and reliable drinking water and sewer service. CVWD has developed capital programs to address these needs. The Sanitation Consolidation Master Plan capital costs total nearly $140 million (2018 dollars). It includes consolidation of 55 individual septic systems into 18 projects. These projects have been ranked in order with consideration given to ease of completion, sequencing, and necessity. The Domestic Water Consolidation Master Plan capital costs total nearly $72 million (2018 dollars). This would consolidate 75 small water systems and group them into 39 projects, which have been ranked in order by ease of completion, sequencing, and necessity.

General outreach efforts conducted by the CVRWMG aim to encourage DAC participation in the Coachella Valley IRWM Program and to ensure that DAC needs, and concerns are incorporated into current and future planning documents. The Coachella Valley IRWM Program has also provided increased technical, engineering, and grant support for DACS that apply for IRWM grant opportunities. Through Proposition 84 and the California Water Quality, Supply, and infrastructure Improvement Act of 2014 (Proposition 1), the IRWM Program has provided millions of dollars to support DAC planning and construction projects.

Water-Related Needs of DACs in the Coachella Valley

As documented in the *2018 Coachella Valley IRWM/SWR Plan*, the Coachella Valley IRWM Region has a wide range of DACs from different demographics, including migrant and seasonal farm workers, low-income families, low-income seniors, and others. Several water management issues specific to DACs were identified, including drinking water supply and water quality, sanitation needs, flooding concerns, and maintaining the affordability of water.

Through the DAC Outreach Program survey process, three primary water-related concerns were consistently raised by DAC stakeholders: water supply (drinking water), wastewater, and flooding. Further, through the development of the *2014 Coachella Valley IRWM Plan* and the *2010 Coachella Valley IRWM Plan*, stakeholders identified that maintaining water affordability is a primary concern to residents and is of specific concern to DACs that may be disproportionally affected by rate increases. Because the issue of water affordability consistently rose to the top of issues expressed by stakeholders, the CVRWMG included "maintain affordability of water" as an objective of the IRWM Plan (Objective M). Additional information on DAC needs and issues can be found in the *2018 Coachella Valley IRWM/SWR Plan* in Chapter 4, Disadvantaged Communities. Of the primary water-related

concerns identified by DACs, stakeholders considered wastewater needs and drinking water quality the most critical with specific focus on the following:

- Wastewater systems that require maintenance and DAC residents' interest in better understanding of how to maintain onsite wastewater systems to avoid failures, overflows, and other issues
- Faulty septic systems that require rehabilitation or, where feasible, connection to municipal sewer systems
- Education on the source of water supply to help individuals learn who is responsible for regulating, testing, and ensuring quality drinking water and knowing who to contact when issues arise
- Lack of access in some areas to clean drinking water (either due to lack of municipal services or through some source of contamination between the meter and the tap) and need for onsite water treatment systems or alternative water supplies, which can be cost-prohibitive

While there are DACs located throughout the Coachella Valley, the survey conducted through the DAC Outreach Program found that the direst and most pressing issues tend to be found in places where DACs do not receive municipal water supply or wastewater services. Such areas are most heavily concentrated in the Eastern Coachella Valley, southeast of the cities of Indio and Coachella. Within the Eastern Coachella Valley, the survey indicated the presence of small MHP communities that rely on onsite drinking water systems that were in a notable state of disrepair. Specifically, surveyors noted onsite leaking and ponding of water, pipes that were corroding or breaking, and pipes that were not properly connected or jointed and could therefore potentially carry contaminated water into the mobile home units.

The Coachella Valley IRWM Region, along with Anza Borrego Desert, San Gorgonio, Imperial, and Mojave IRWM regions, prepared the *CRFA Water Needs Assessment* in 2020 to identify DAC communities throughout the CRFA and identify and characterize water-related issues and needs of communities. Through the process of the *Water Needs Assessment*, the following challenges were identified in the Colorado River Funding Area:

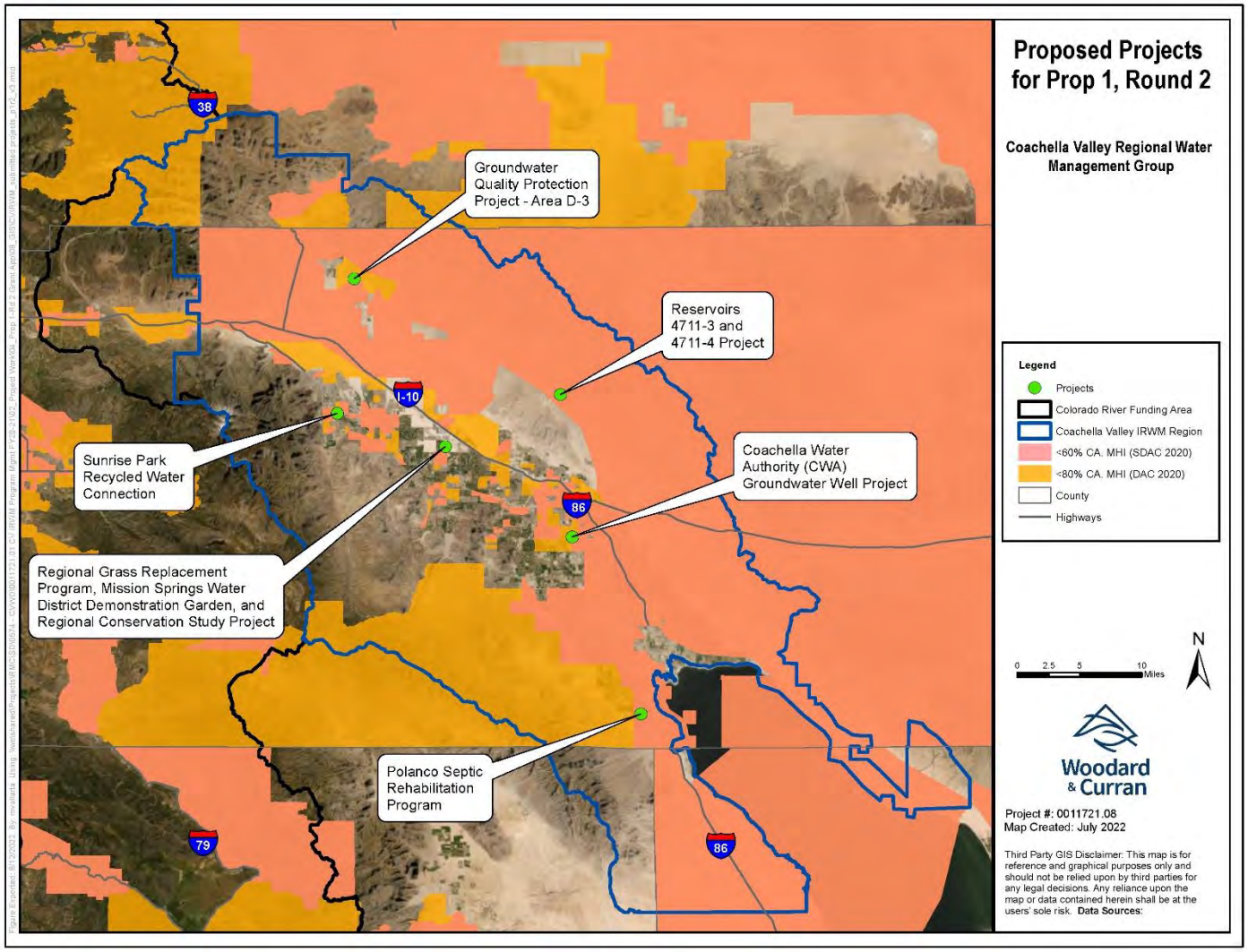
- Access to safe drinking water
- Failing and/or densely located septic systems which cause water quality issues
- Septic to sewer conversion/connection to municipal services
- Upgrade water and wastewater infrastructure
- Aging infrastructure upgrades are needed
- Access to reliable water supply
- Need for flood facilities
- Access to safe, reliable water quality and living environments in Allottee land
- Funding to address DAC needs

Project Consistency with Water-Related Needs of DACs

Five of the six projects included in this Proposal will directly address water-related needs of DAC areas as described in the *2018 Coachella Valley IRWM/SWR Plan* and the *CRFA Water Needs Assessment*. The first project, *Reservoirs 4711-3 and 4711-4*, will improve water shortage in a DAC by building two new 1-million gallon above ground welded tanks, ensuring DACs have access to a reliable water supply. The second project, *Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project* will vary in its DAC benefits depending on where the turf reduction projects occur, but the project will allow more DACs to participate in local water conservation programs. The third project, *Groundwater Quality Protection Project – Area D-3*, will connect 102 parcels to the Mission Springs Water District's (MSWD's) sewer system and abate 81 on-site septic systems, which will protect drinking water supplies and ensure DACs have access to safe drinking water. The fourth project, *CWA Groundwater Well Project*, will construct one well, providing safe, clean drinking water and improving water supply reliability to the surrounding DAC areas. The fifth project, *Polanco Septic Rehabilitation Program* will install 10 new septic systems to two Polanco MHPs, protecting

groundwater quality in DACs. Additional detail on the DAC benefits of all five projects is provided in the sections below.

Figure 5-1: DAC Project Summary Map



Direct Benefits to DACs

Project 1: Reservoirs 4711-3 and 4711-4 Project

The *Reservoirs 4711-3 and 4711-4 Project* would improve water storage infrastructure and ensure reliable and sustainable domestic water supply and fire flow protection to CVWD customers within the Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills. The existing 100,000-gallon above ground bolted-steel tanks (Reservoirs 4711-1 and 4711-2) were originally constructed in 1993 and 1999. The reservoirs have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage due to this general deterioration and minor leaks.



Corrosion Along the Bolt Seams

Indio Hills is an expansive but sparsely developed, rural residential enclave. Per DWR's DAC Mapping Tool, Indio Hills is within a SDAC area (**Figure 5-2**). The median MHI in the 2020 census place was $41,964, which is less than the 60% of the statewide MHI of $47,203. Thus, Indio Hills qualifies as a SDAC.

Percentage of Project Benefits Provided to a DAC

This project is in a 100% SDAC area (see **Figure 5-2**). The project would replace the existing two 100,000-gallon water reservoirs with two 1 MG reservoirs, providing a total of 2 million gallons of water storage to accommodate existing and future demands. Additionally, the project will improve water supply reliability for approximately 800 people living in the Indio Hills community. Overall, the construction of Reservoirs 4711-3 and 4711-4 would ensure reliable and sustainable domestic water supply and fire protection to the Indio Hills Community.

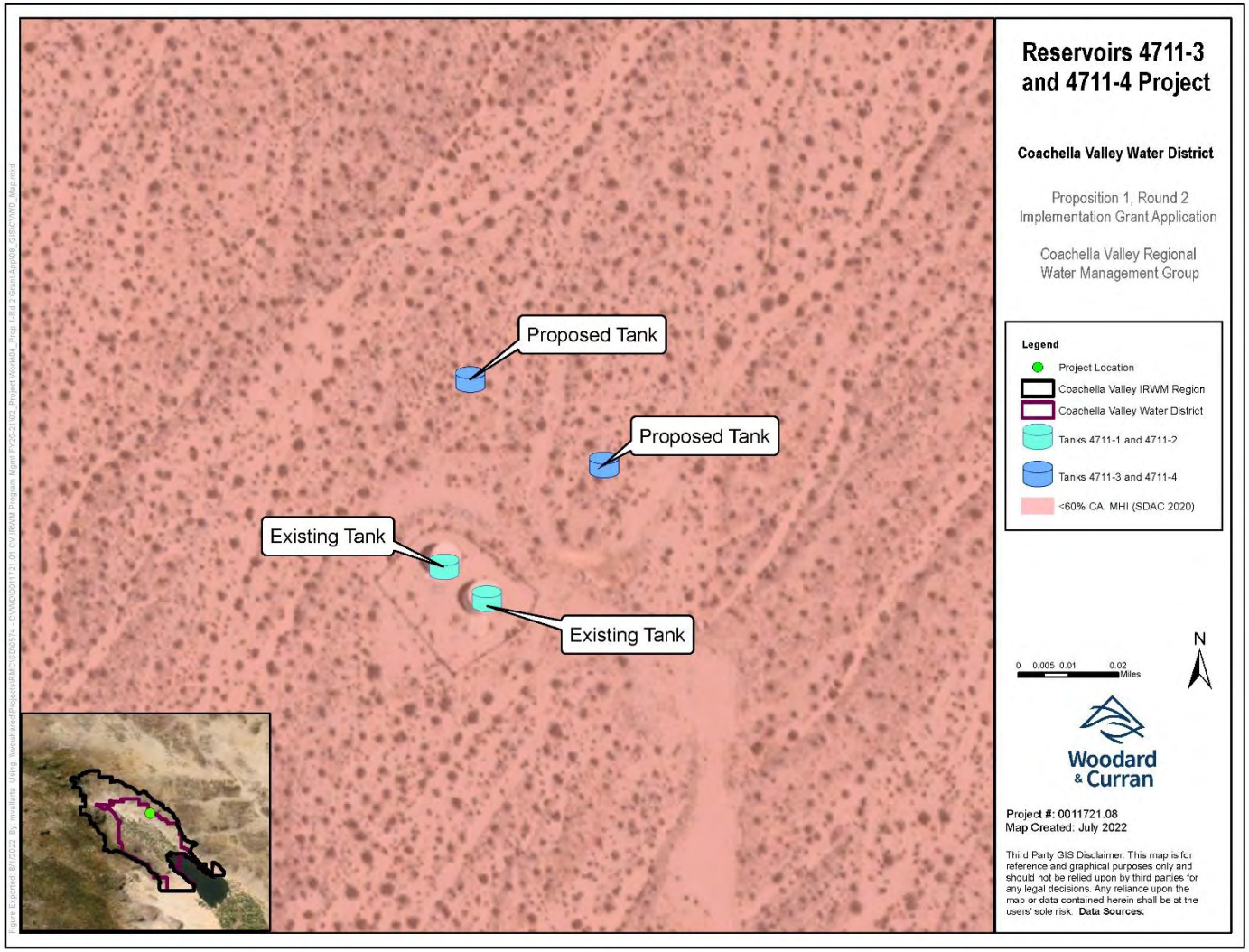
Water Storage	**Water Supply Reliability**
Provide 2 million gallon of water storage	Improve water supply reliability to 800 people in the Indio Hills Community

Letters of Support

The project has received five letters of support from a local organization and local, state and federal representatives. These letters have been included in **Appendix 5-1.**

- Melissa A. Melendez, State Senator of the 28th Senate District, California State Senate, July 30, 2022
- Raul Ruiz, Congressman of the 36th District, Congress of the United States, August 3, 2022
- Eduardo Garcia, Assemblymember of the 56th District, California State Assembly, August 4, 2022
- V. Manuel Perez, Supervisor of the 4th District, County of Riverside, August 4, 2022
- Cal Fire – Riverside Unit, Riverside County Fire Department, August 4, 2022

Figure 5-2: Reservoirs 44711-3 and 4711-4 Project



Project 2: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project

The *Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project* will serve the service areas of the CVRWMG agencies, which include CVWD, Indio Water Authority, MSWD, DWA, and CWA. Overall, the project will address the challenges DACs face, such as water affordability and water supply reliability. One component of the project, Regional Grass Replacement Program, will directly benefit DACs by reducing potable water demands through water-efficient landscaping. In the Regional Conservation Study, the CVRWMG agencies will use the decision support tool to evaluate the water savings and cost-effectiveness of the grass removal program, which may result in additional conservation programs that benefit DACs. The MSWD demonstration garden will serve as an education tool for the DAC community in MSWD's service area.

For the Regional Grass Replacement component, each of the CVRWMG agencies have DACs within their service areas. DAC residents that apply for the incentive program will be directly benefited and there is a long-term capital cost reduction benefit to non-participant DAC residents as well. Per DWR's DAC Mapping Tool, multiple portions of the service area of the CVRWMG agencies are located in a DAC or SDAC areas (**Figure 5-3).** Water savings provided by the project directly translate into cost savings to DACs by reducing water bills, and indirectly benefits DACs through reduced water rate increases and improved water supply reliability due to decreased demand for groundwater.

The Regional Conservation Study Project will not directly benefit DACs, but the CVRWMG agencies will use the decision support tool to quantify the grass replacement program savings that account for local conditions and practices. The Regional Conservation Study will provide updated and local water savings data derived from turf replacements in the Coachella Valley and could inform the amount of funding offered to residents per square foot of grass removed. Additionally, CVRWMG agencies will use this water savings data to apply for more funding for turf conversions programs, which DACs in the Coachella Valley IRWM Region can apply for.

Percentage of Project Benefits Provided to a DAC

As seen in **Figure 5-3**, 48% of the CVRWMG service area qualifies as a SDAC and 17% qualifies as a DAC. The *2018 Coachella Valley IRWM/SWR Plan* documents that DACs may be disproportionately affected by increased water costs and that is an objective for the IRWM Region to maintain water affordability. The project will benefit DAC residents by providing a cost-effective way to manage the Region's groundwater resources and helping to avoid future water cost increases.

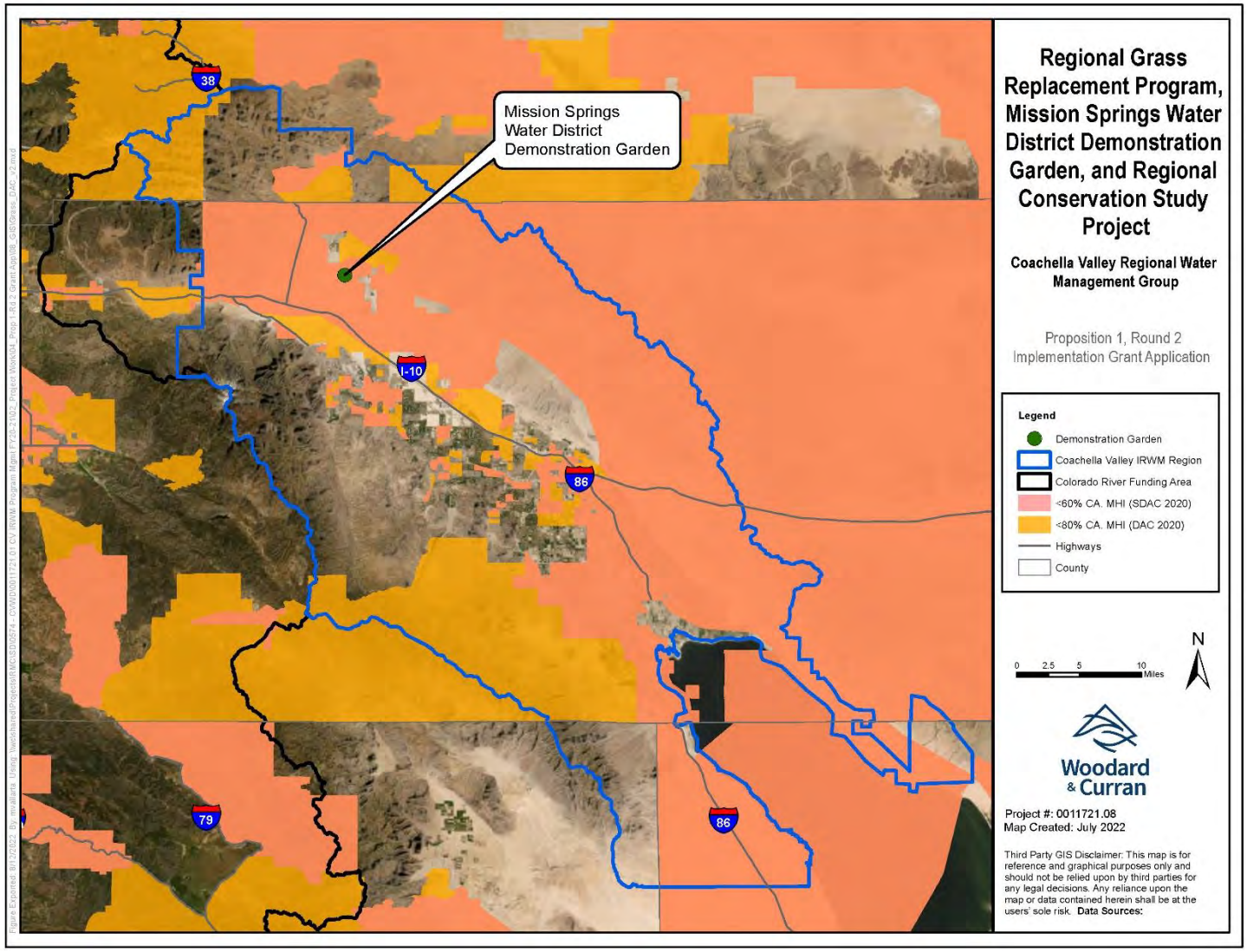
Water Savings	**Reduced Groundwater Pumping**
57.08 AFY of water savings, which results in roughly 856 AF of water saved over the life of the project (15 years)	57.08 AFY of reduced groundwater pumping which results in a reduction of roughly 856 AF of reduced groundwater pumping over the life of the project (15 years)

Letters of Support

The project has received two letters of support from local cities in the Coachella Valley IRWM Region. These letters have been included in **Appendix 5-1.**

- The City of Cathedral City, July 27, 2022
- The City of Palm Springs, July 28, 2022

Figure 5-3: Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project



Project 3: Groundwater Quality Protection Project – Area D-3

The *Groundwater Quality Protection Project – Area D-3* is part of Assessment District 18, approved by voters in December 2019, and will continue MSWD's successful history of converting areas from an on-site disposal system to the public sewer collection. As of 2019, MSWD had converted 7,800 parcels and was scheduled to convert the remaining 3,200 parcels by 2025. The project will construct a portion of the wastewater collection in Area D-3, connecting 102 parcels to the MSWD sewer system and abating 81 on-site septic systems that have negatively impacted groundwater sources, primarily from nitrate contamination.

The project area is 100% in a DAC (**Figure 5-4**). Furthermore, the project will benefit the City of Desert Hot Springs, which has a MHI of $37,818, which is less than the 60% of the statewide MHI of $47,203. Thus, the City of Desert Hot Springs qualifies as a SDAC.

The surrounding DAC areas will also benefit from the removal of the septic systems. On-site septic systems negatively impact mineral water supplies in the Desert Hot Springs Subbasin and potable water supplies in the Mission Creek Subbasin, and MSWD provides 100% of its domestic water supplies from groundwater, primarily the Mission Creek Subbasin. By converting the on-site septic systems, it will improve groundwater quality, ensuring DACs have safe and reliable water supplies.

Percentage of Project Benefits Provided to a DAC

As shown in **Figure 5-4**, the project area is 100% DAC. This project will benefit the DAC areas and the non-DAC areas by reducing bacteria levels in the aquifer, improving wastewater treatment and decreasing the community's dependence on septic systems. Connecting Area D-3 to the existing MSWD sewer system will provide 22.9 AFY of treated wastewater and recharge it to the Mission Creek Subbasin and improve groundwater quality. By providing sanitation service to DACs, MSWD supports these communities in avoiding environmental injustices. Consolidating septic systems with public health issues into large municipal sewer systems protects groundwater quality for DACs.

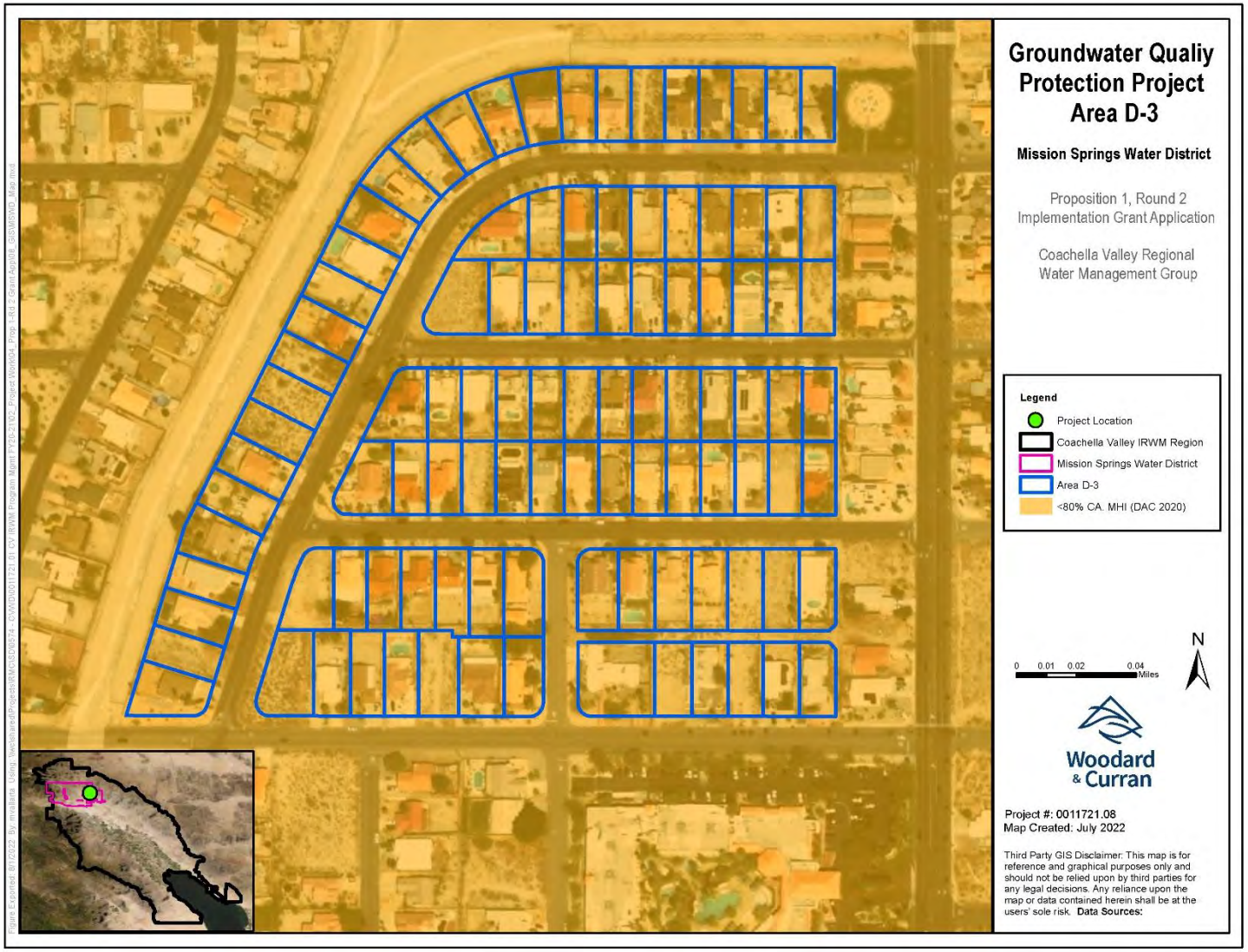
Water Quality Benefit	**Water Supply Benefit**
22.9 AFY of improved water quality	22.9 AFY of treated wastewater recharged to the aquifer

Letters of Support

The project has received two letters of support from a local city in the Coachella Valley IRWM Region and a local representative. These letters have been included in **Appendix 5-1.**

- City of Desert Hot Springs, July 26, 2022
- V. Manuel Perez, Supervisor of the 4th District, County of Riverside, August 1, 2022

Figure 5-4: Groundwater Quality Protection Project Area D-3



Project 4: Coachella Water Authority Groundwater Well Project

Some small water systems (SWSs) depend on unreliable groundwater wells that do not meet drinking water quality standards. To ensure safe, clean drinking water for residents within its service area, CWA is in the process of consolidating SWSs that rely on individual, private groundwater wells into its municipal water system. The project will construct one new groundwater well, which will increase CWA's overall production capacity and improve operational flexibility by increasing the number of wells CWA has access to and can pump as needed to meet demands.

This project will benefit SWSs in CWA's service area. Per DWR's Mapping Tool, CWA's service area is located in a SDAC (**Figure 5-5**). In the next year, CWA will consolidate three SWSs (Mesquite Mutual Water Company, Castro's Mobile Home Community, and Shady Lane MHP) that have experienced poor water quality, poor water supply reliability, and lack of redundancy. In order to reliably serve these SWSs and CWA's existing customers, CWA needs a new groundwater well to increase its overall production capacity.

Percentage of Project Benefits Provided to a DAC

As shown in **Figures 5-5**, 85% of CWA's service area qualifies as a SDAC. The Project consists of the construction of a groundwater well to provide 2,500 AFY of additional potable water supply to CWA's system. This addition of groundwater production in the Low Zone pressure zone of the water system will directly support multiple SWS consolidations. The Project will provide high-quality, reliable water supply to the small DACs currently being served by privately-owned SWSs that historically depend on private wells that produce unreliable and often unsafe water supply. Additionally, the improved water supply reliability that will result from the Project will benefit all of the approximately 45,522 customers served by CWA.

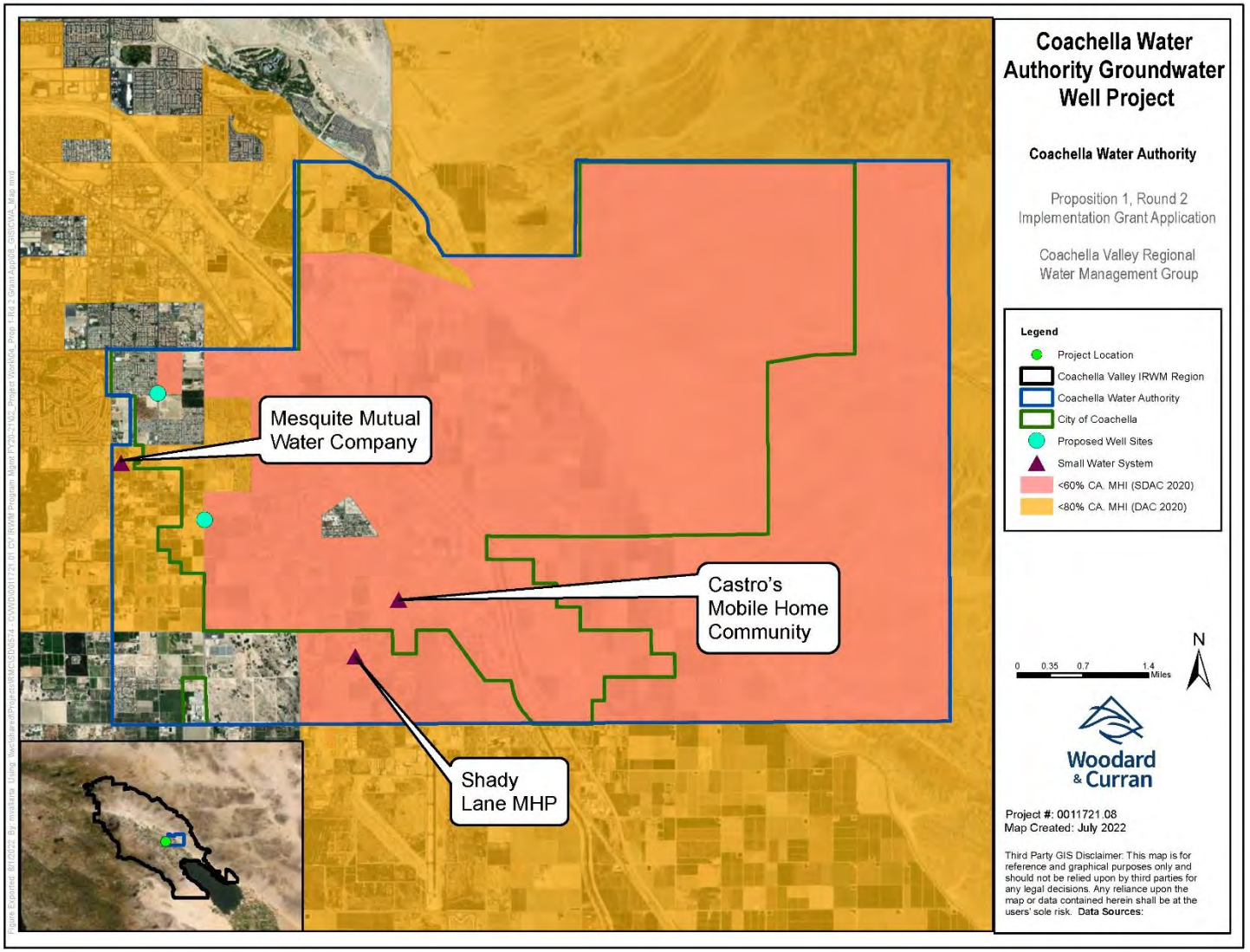
Water Supply Benefit	**Water Supply Reliability**
2,500 AFY of potable water supply	Improved water supply reliability to 45,552 people

Letters of Support

The project has received support from local cities and local, state, and federal representatives that support the 2022 Coachella Valley IRWM Proposition 1, Round 2 Implementation Grant Proposal. These letters have been included in **Appendix 5-1.**

- The City of Cathedral City, July 27, 2022
- Melissa A. Melendez, State Senator of the 28th Senate District, California State Senate, July 30, 2022
- Eduardo Garcia, Assemblymember of the 56th District, California State Assembly, August 4, 2022
- V. Manuel Perez, Supervisor of the 4th District, County of Riverside, August 4, 2022

Figure 5-5: Coachella Water Authority Groundwater Well Project



Project 5: Polanco Septic Rehabilitation Program

The *Polanco Septic Rehabilitation Program* will provide technical assistance to install 10 new septic systems to two Polanco MHPs, which currently have improperly installed septic systems. The Coachella Valley DAC Outreach Program, completed in 2013, included a comprehensive outreach and involvement program to identify DAC needs throughout the Coachella Valley. Through this effort, community residents, non-profits and government entities identified issues with onsite septic systems, especially those within the Eastern Coachella Valley, as major issues. Stakeholders indicated that low infiltration rates in areas with shallow groundwater, combined with under-sized septic systems, could lead to public health issues associated with surfacing wastewater. If consolidation into a nearby municipal sewer system is not feasible for these failing septic systems, the DAC Outreach Program recommended comprehensive re-design and re-sizing of septic systems to ensure that these systems could handle the volume of wastewater produced by residents. Aging or failing septic systems that result in surfacing wastewater are a serious public health concern and a potential source of bacteria and nitrates in the groundwater and adjacent surface water systems. There is a need to rehabilitate or replace aging or failing septic systems to protect the public health of local residents and the Region's groundwater supplies and prevent constituents of concern from entering the Coachella Valley Stormwater Channel and the Salton Sea in areas where failing septic systems are located in the shallow groundwater aquifer.

Percentage of Project Benefits Provided to a DAC

The Eastern Coachella Valley area in which these two MHPs are located is within a SDAC area (**Figure 5-6 and 5-7**) per DWR DAC Mapping Tool. Rehabilitation of these septic systems will reduce pollution loading of solids and bacteria to both shallow groundwater and to local surface waters. Surfacing wastewater due to septic failure results in a potential public health threat due to the potential for direct human contact with inadequately treated sewage. Inadequately treated septic flows to groundwater can result in contaminated drinking water, as many residents in this DAC area may rely on shallow groundwater wells for drinking water supply. Surfacing flows can also lead to runoff of bacteria and solids directly into the local waterways and ultimately to the Salton Sea, which is a source of recreation in the valley.

Groundwater Quality Benefit	**Water Quality Benefit**
Reduce approximately 800 pounds per year of total suspended solids to groundwater.	Reduce approximately 800 pounds per year of total suspended solids to groundwater and local surface waters

Letters of Support

The project has support from local cities and local, state, and federal representatives that support the 2022 Coachella Valley IRWM Proposition 1, Round 2 Implementation Grant Proposal. These letters have been included in **Appendix 5-1.**

- The City of Cathedral City, July 27, 2022
- Melissa A. Melendez, State Senator of the 28th Senate District, California State Senate, July 30, 2022
- Eduardo Garcia, Assemblymember of the 56th District, California State Assembly, August 4, 2022
- V. Manuel Perez, Supervisor of the 4th District, County of Riverside, August 4, 2022

Figure 5-6: Polanco Septic Rehabilitation Program – Campos MHP

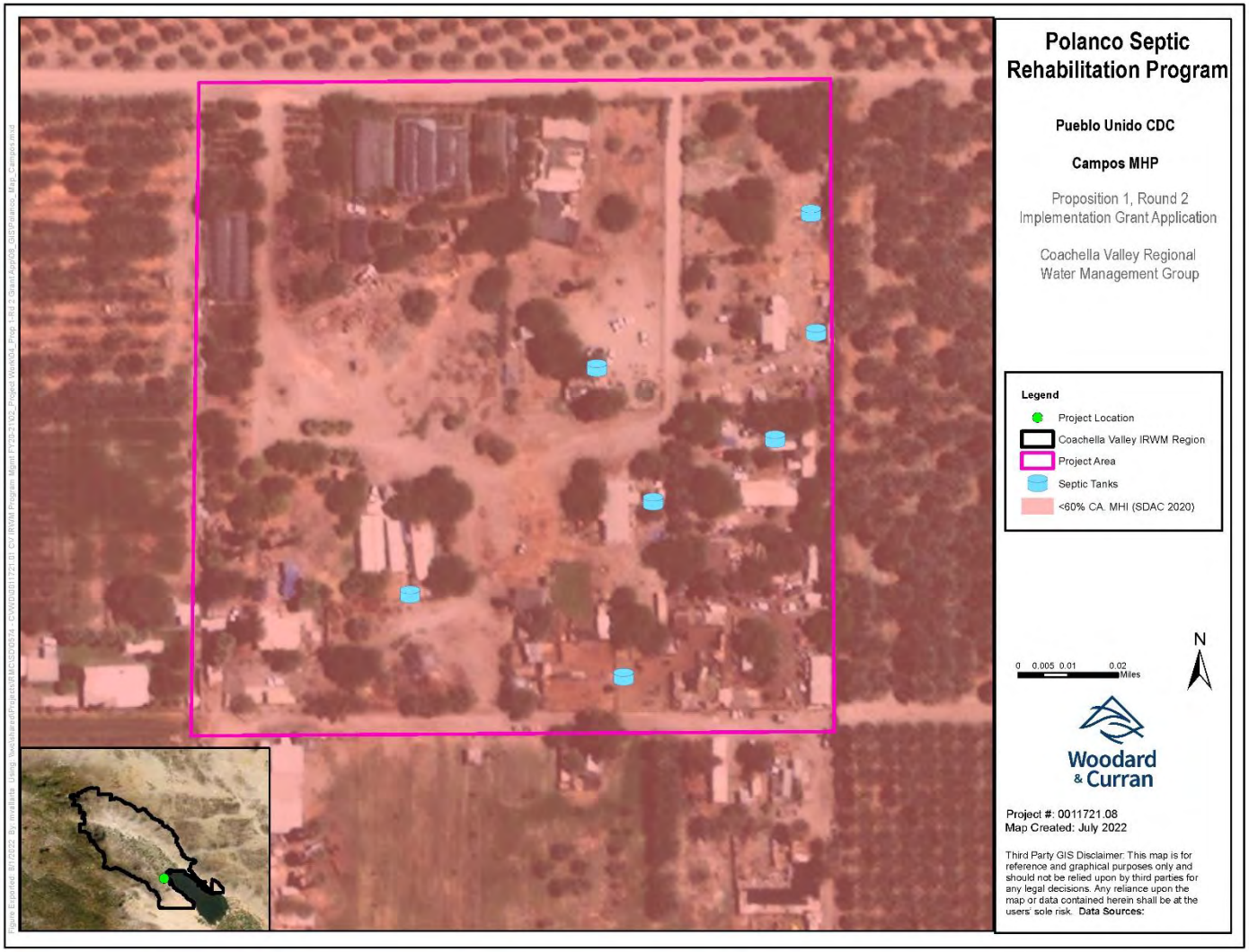
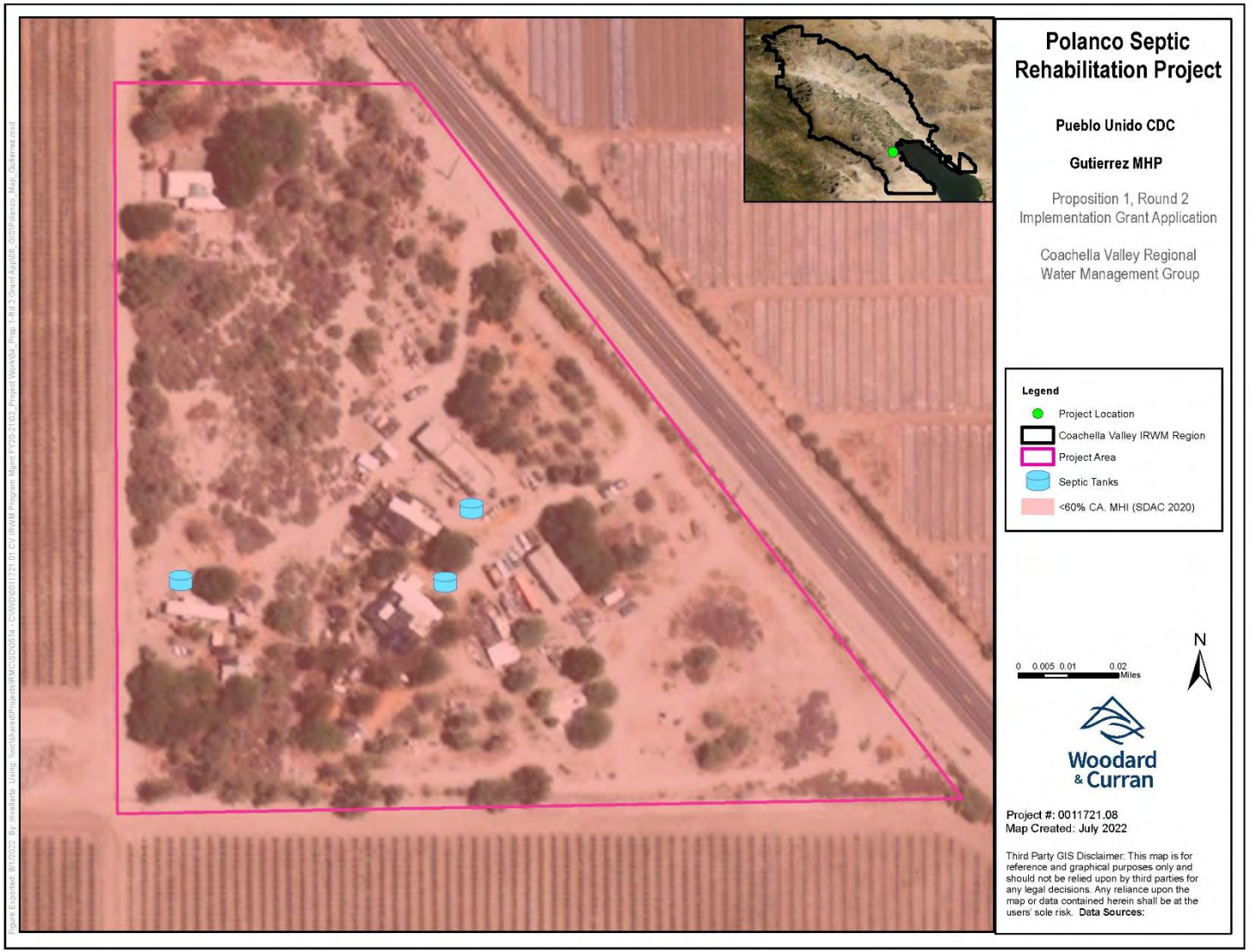


Figure 5-7: Polanco Park Rehabilitation Program – Gutierrez MHP



Indirect Benefits to DACs

Project 6: Sunrise Park Recycled Water Connection Project

The *Sunrise Park Recycled Water Connection Project* would extend DWA's recycled water pipe system to serve the irrigation needs at Sunrise Park. In mid-2020, DWA's largest recycled water customer dropped offline with no advanced warning. The plant is now operating at a reduced capacity and more wastewater is being percolated rather than tertiary treated and delivered to irrigation customers. This presents operational and financial challenges to DWA's recycled water operations. DWA is exploring new, cost-effective connections to its system, but given that it is not the sewer provider in the City of Palm Springs, is limited in how to pay for recycled water system improvements. The City of Palm Springs has long been interested in connecting Sunrise Park to recycled water, but has not had the resources to pay for the system extension. Connecting this area, with roughly 1,000,000 square feet of grass, to non-potable water would reduce groundwater demand, improve water quality, and reduce costs for local taxpayers. It would also make the park more drought resistant given that many restrictions during drought apply to potable water.

Project Benefits Provided to a DAC

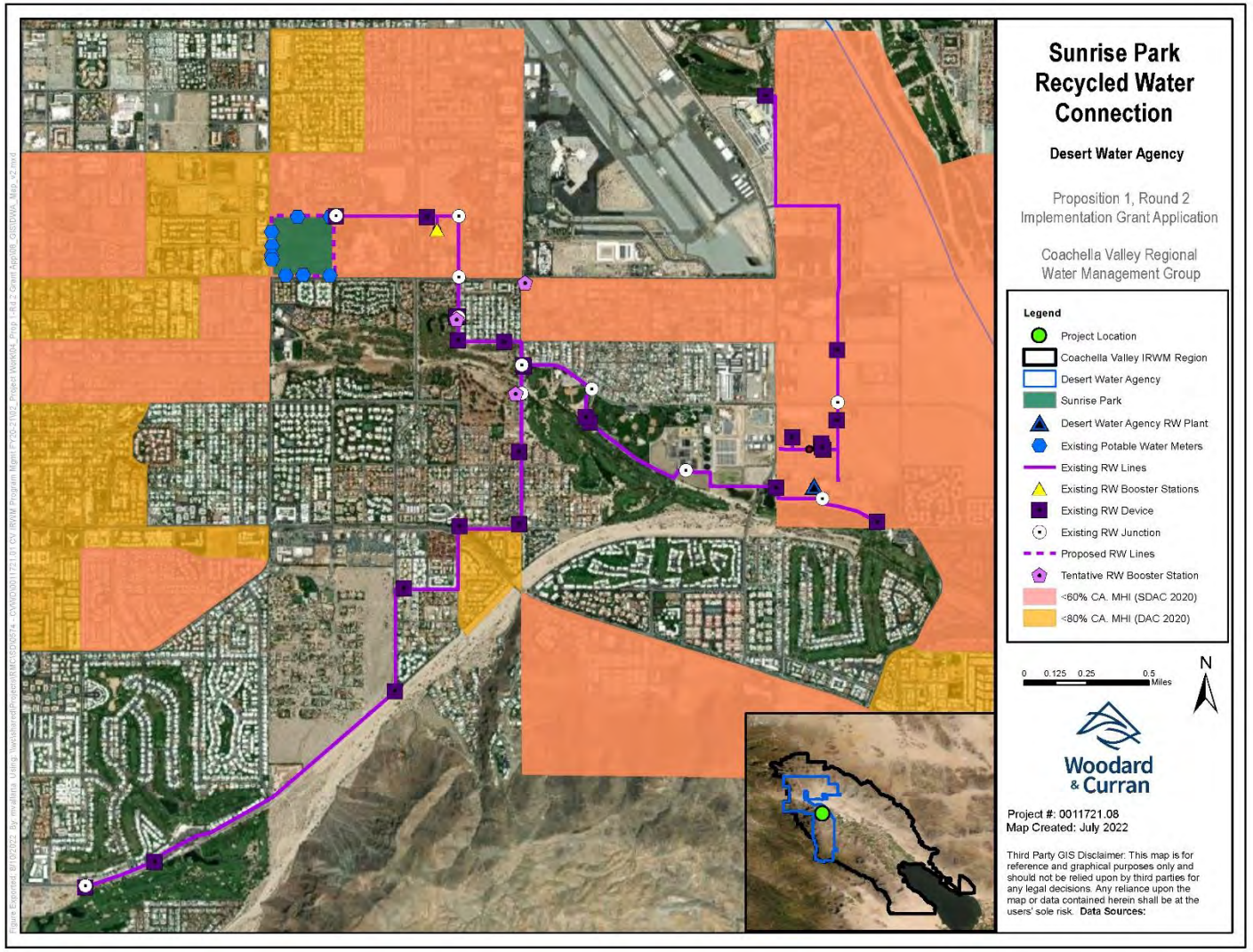
While Sunrise Park is in a SDAC area (**Figure 5-8**) per DWR's DAC Mapping Tool, the project does not directly benefit DACs. However, the surrounding SDAC and DAC areas frequently use Sunrise Park for recreational activities. Sunrise Park is home to the Boys & Girls Club of Palm Springs and the Mizell Center. The Boys & Girls Club of Palm Springs is a nonprofit organization, providing a wide range of after school, summer, and winter programs in a safe and supervised environment for over 1,700 children. The Mizell Center is a non-denominational organization that has been serving the senior community in the greater Palm Springs area since 1974. By serving the irrigation needs of the park, the project is ensuring that DACs have access to urban green spaces. Historically, DACs have not had access to urban green spaces. According to the "Urban and Green Spaces Health" report from the World Health Organization, urban green spaces have substantial health benefits such as reduced exposure to air pollutants, noise, and excess heat. Additionally, by using recycled water to irrigate Sunrise Park, it will make more potable water available for storage during prolonged drought periods.

Letters of Support

The project has received one letter of support from a local city in the Coachella Valley IRWM Region. This letter has been included in **Appendix 5-1.**

- The City of Palm Springs, July 28, 2022

Figure 5-8: Sunrise Park Connection Recycled Water Connection Project



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FAX (916) 319-2156

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COACHELLA, CA 92236
(760) 347-2360
FAX (760) 347-5704

IMPERIAL COUNTY DISTRICT OFFICE
1101 AIRPORT ROAD, SUITE D
IMPERIAL, CA 92251
(760) 355-8656
FAX (760) 355-8856

Assembly
California Legislature

EDUARDO GARCIA
ASSEMBLYMEMBER, FIFTY-SIXTH DISTRICT

STANDING COMMITEES

CHAIR: UTILITIES AND ENGERY

APPROPRIATIONS
COMMUNICATIONS AND CONVEYANCE
GOVERNMENTAL ORGANIZATION

August 4, 2022

Ashley Gilreath

Round 2 IRWM Implementation Grant Program Manager

California Department of Water Resources

P.O. Box 942836

Sacramento, CA 94236

Dear Ms. Gilreath,

I am pleased to submit this letter of support for the *Reservoirs 4711-3 and 4711-4 Project* proposed by the Coachella Valley Water District (CVWD) through the Coachella Valley Regional Water Management Group for funding through Proposition 1, Round 2 Implementation Grant.

The *Reservoirs 4711-3 and 4711-4 Project* will construct two 1 million-gallon (MG) aboveground welded-steel tanks and subsequently demolish the existing 100,000-gallon aboveground bolted tanks, Reservoirs 4711-1 and 4711-2, which were originally constructed in 1993 and 1999 respectively. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, a disadvantaged community.

Reservoirs 4711-1 and 4711-2 have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage due to this general deterioration and minor leaks. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This deficiency exposes the Indio Hills community to water insecurities and results in poor water supply reliability as low pressure can pull contaminants into the pipe distribution system negatively affecting water quality and decreasing the system's fire suppression readiness.

Implementation of this project will provide the Indio Hills community with enhanced storage capacity, which will improve water supply reliability and provide a reliable and sustainable domestic water supply and fire protection. I believe that this proposal will help our region protect water reliability and provide increased quality for the community For these I reasons I strongly support the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Thank you for your time and consideration. If you have, any questions regarding this letter feel free to contact my office at (760) 347-2360.

Sincerely,

Eduardo Garcia
Assemblymember, 56th District

CAL FIRE – RIVERSIDE UNIT
RIVERSIDE COUNTY FIRE DEPARTMENT

BILL WEISER - FIRE CHIEF
Office of the County Fire Marshal (East)
77933 Las Montañas Rd, Ste. 201, Palm Desert, CA 92211
(760) 863-8886 www.rvcfire.org

PROUDLY SERVING THE UNINCORPORATED AREAS OF RIVERSIDE COUNTY AND THE CITIES OF:

BANNING
BEAUMONT
CANYON LAKE
COACHELLA
DESERT HOT SPRINGS
EASTVALE
INDIAN WELLS
INDIO
JURUPA VALLEY
LAKE ELSINORE
LA QUINTA
MENIFEE
MORENO VALLEY
NORCO
PALM DESERT
PERRIS
RANCHO MIRAGE
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BOARD OF SUPERVISORS:

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DISTRICT 1

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DISTRICT 3

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DISTRICT 4

JEFF HEWITT
DISTRICT 5

August 4, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of Cal Fire – Riverside Unit, Riverside County Fire Department, we are pleased to support the *Reservoirs 4711-3 and 4711-4 Project* proposed by the Coachella Valley Water District through the Coachella Valley Regional Water Management Group for funding through Proposition 1, Round 2 Implementation Grant.

We assume the following information, as conveyed to us by the Coachella Valley Water District, to be accurate and true:

The Reservoirs 4711-3 and 4711-4 Project will construct two 1 million-gallon (MG) aboveground welded-steel tanks and subsequently demolish the existing 100,000-gallon aboveground bolted tanks, Reservoirs 4711-1 and 4711-2, which were originally constructed in 1993 and 1999. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, a disadvantaged community. Reservoirs 4711-1 and 4711-2 have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage due to this general deterioration and minor leaks. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This deficiency exposes the Indio Hills community to water insecurities and results in poor water supply reliability as low pressure can pull contaminants into the pipe distribution system negatively impacting water quality and decreasing the system's fire suppression readiness. Implementation of this project will provide the Indio Hills community with adequate storage capacity, which will improve water supply reliability and provide reliable and sustainable domestic water supply and fire protection.

Therefore, we recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Please do not hesitate to contact me if you have any questions. I can be reached at chris.cox@fire.ca.gov or (760) 863-8886.

Sincerely,

Chris Cox

Chris Cox
Assistant Fire Marshal

RAUL RUIZ, M.D.
Member of Congress
36th District of California

Congress of the United States
House of Representatives
Washington, DC 20515-3605

Washington, D.C. Office:
2342 Rayburn House
Office Building
Washington, D.C. 20515
Phone: 202-225-5330

August 3, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Letter of Support: Coachella Valley Water District Reservoirs 4711-3 and 4711-4 Project

Dear Ms. Gilreath,

I write in support of the Coachella Valley Water District's (CVWD) application for the Reservoirs 4711-3 and 4711-4 Project. This proposal will allow for the construction of two water reservoirs in the underserved Indio Hills area.

CVWD's proposal focuses on rehabilitation and replacement of existing water infrastructure systems in the Coachella Valley region. Currently, Reservoirs 4711-1 and 4711-2 have moderate-to-severe corrosion and no longer provide reliable water storage due to this general deterioration and minor leaks. Funding from the California Department of Water Resources would be used to construct two 1 million-gallon above-ground welded-steel tanks, increasing reliability and water sustainability for the underserved Indio Hills area.

As the Representative of California's 36th Congressional District, I understand the urgent need for improved water infrastructure in the Coachella Valley area, especially in disadvantaged communities like Indio Hills. The area is drought-prone and home to several underserved communities. Through these programs, local businesses and residents throughout the Coachella Valley region will be granted improved water supply reliability and sustainability for years to come.

I believe that CVWD is a worthy candidate for your grant funding. I support their efforts and urge full and fair consideration of their application, consistent with all relevant program rules

and regulations. If you have any additional questions, please feel free to contact my congressional office at 760-424-8888.

Sincerely,



Raul Ruiz, M.D.
Member of Congress

STATE CAPITOL
SACRAMENTO, CA 95814
TEL (916) 651-4028

MURRIETA DISTRICT OFFICE
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MURRIETA, CA 92562
TEL (951) 894-3530

INDIO DISTRICT OFFICE
45-125 SMURR STREET
SUITE B
INDIO, CA 92201
TEL (760) 398-6442

California State Senate

SENATOR
MELISSA A. MELENDEZ
TWENTY-EIGHTH SENATE DISTRICT

COMMITTEES
HEALTH
VICE CHAIR
HUMAN SERVICES
TRANSPORTATION

SUBCOMMITTEE
BUDGET
SUBCOMMITTEE #3
ON HEALTH & HUMAN
SERVICES

July 30, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the California 28th Senate District, we are pleased to submit this letter of support for the *Reservoirs 4711-3 and 4711-4 Project* proposed by the Coachella Valley Water District through the Coachella Valley Regional Water Management Group for funding through Proposition 1, Round 2 Implementation Grant.

The *Reservoirs 4711-3 and 4711-4 Project* will construct two 1 million-gallon (MG) aboveground welded-steel tanks and subsequently demolish the existing 100,000-gallon aboveground bolted tanks, Reservoirs 4711-1 and 4711-2, which were originally constructed in 1993 and 1999. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, a disadvantaged community.

Reservoirs 4711-1 and 4711-2 have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage due to this general deterioration and minor leaks. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This deficiency exposes the Indio Hills community to water insecurities and results in poor water supply reliability as low pressure can pull contaminants into the pipe distribution system negatively impacting water quality and decreasing the system's fire suppression readiness.

Implementation of this project will provide the Indio Hills community with adequate storage capacity, which will improve water supply reliability and provide reliable and sustainable domestic water supply and fire protection. We recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Please do not hesitate to contact me if you have any questions. Contact my District Director Glenn Miller at glenn.miller@sen.ca.gov or 760.398.6442.

Sincerely,

Melissa Melendez
California State Senator
28th Senate District

County of Riverside

Riverside Office:
4080 Lemon Street, 5th Floor
Riverside, CA 92502-1647
(951) 955-1040
Fax (951) 955-2194

District Office/Mailing Address
73-710 Fred Waring Drive, Suite 222
Palm Desert, CA 92260-2574
(760) 863-8211
Fax (760) 863-8905

SUPERVISOR V. MANUEL PEREZ
FOURTH DISTRICT

August 4, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ashley Gilreath:

I write today in support of the proposal submitted by the Coachella Valley Water District and the Coachella Valley Regional Water Management Group for funding through the Proposition 1, Round 2 Implementation Grant for the Reservoirs 4711-3 and 4711-4 Project in the community of Indio Hills.

The Reservoirs 4711-3 and 4711-4 Project, led by the Coachella Valley Water District, would construct two one million-gallon aboveground welded-steel tanks and subsequently demolish the existing 100,000-gallon aboveground bolted tanks, Reservoirs 4711-1 and 4711-2, which were originally constructed in 1993 and 1999. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to the Coachella Valley Water District's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, which is considered a disadvantaged community (DAC).

Implementation of this project would provide the Indio Hills community with adequate storage capacity, which would improve water supply reliability and provide reliable and sustainable domestic water supply and fire protection.

For these reasons, as supervisor for Riverside County's Fourth District, representing the eastern two-thirds of Riverside County and as the representative in local government for the unincorporated community of Indio Hills, I am pleased to support the efforts of the Coachella Valley Water District to secure state funding for this project.

If you have any questions about my support for this project, please don't hesitate to contact me at (760) 863-8211. Thank you for your consideration.

Sincerely,

V. MANUEL PEREZ
Supervisor, Fourth District

VMP:das

Cathedral City

July 27, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the City of Cathedral City, we are pleased to submit this letter of support for the Regional Grass Replacement & Study Project proposed by Desert Water Agency – on behalf of Coachella Valley Water District, Coachella Water Authority, Indio Water Authority, and Mission Springs Water District - through the Coachella Valley Regional Water Management Group (CVRWMG) for funding through Proposition 1, Round 2 Implementation Grant.

The project includes multiple project components that are all implemented under the regional program. The first component, the Regional Grass Replacement Program, is a multifaceted program that will make turf rebates available throughout the CVRWMG's service area for a variety of customers. The second component, the Regional Conservation Study Project, is a decision-support tool (DST) that will guide the CVRWMG agencies as they work to determine incentive amounts and water supply benefits.

Implementation of the Regional Grass Replacement Program will reduce water demands for outdoor irrigation by removing turf, which uses significant amount of water, and replacing it with desert landscaping. Furthermore, this project component directly benefits the disadvantaged communities (DACs) in the CVRWMG's service area. DAC residents may apply for the program and allow them to not only save water but reduce their water bills through the installation of drought resistant landscaping. The Regional Conservation Study will allow the CVRWMG agencies to quantify grass replacement program water savings that account for local conditions and practices. We recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Please do not hesitate to contact me if you have any questions. I can be reached at alee@cathedralcity.gov or (760)-770-0319.

Sincerely,

The City of Cathedral City

City of Palm Springs

Justin Clifton

City Manager

3200 E. Tahquitz Canyon Way • Palm Springs, California 92262
Tel: (760) 322-8350 • Fax: (760) 323-8207 • Web: www.palmspringsca.gov

July 28, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the City of Palm Springs, we are pleased to submit this letter of support for the Regional Grass Replacement & Study Project proposed by Desert Water Agency through the Coachella Valley Regional Water Management Group (CVRWMG) for funding through Proposition 1, Round 2 Implementation Grant.

The project has multiple components that are all implemented under the regional program. The first component, the Regional Grass Replacement Program, is a multifaceted program that will make turf rebates available throughout the CVRWMG's service area for a variety of customers. The second component, the Regional Conservation Study Project, is a decision-support tool (DST) that will guide the CVRWMG agencies as they work to determine incentive amounts and water supply benefits.

Implementation of the Regional Grass Replacement Program will reduce water demands for outdoor irrigation by removing turf, which uses a significant amount of water, and replaces it with desert landscaping. The Regional Conservation Study will allow the CVRWMG agencies to quantify grass replacement program water savings that account for local conditions and practices. Currently, the CVRWMG agencies rely on data from the 2005 Southern Nevada Water Authority's Xeriscape Conservation Study to calculate water savings for their turf removal programs. However, this study is now outdated and does not reflect local climate, soil, or irrigation efficiency conditions. We recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Please do not hesitate to contact me if you have any questions. I can be reached at Justin.Clifton@Palmspringsca.gov or 760-322-8362.

Sincerely,

Justin Clifton, City Manager

CITY OF DESERT HOT SPRINGS

CITY MANAGER'S OFFICE

11999 Palm Drive • Desert Hot Springs • CA • 92240
(760) 329-6411 • www.cityofdhs.org

July 26, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the City of Desert Hot Springs, we are pleased to submit this letter of support for the Groundwater Quality Protection Project – Area D-3 proposed by Mission Springs Water District (MSWD) through the Coachella Valley Regional Water Management Group (CVRWMG) for funding through Proposition 1, Round 2 Implementation Grant.

As the lowest median income city in Riverside County, Desert Hot Springs is home to thousands of families which are unable to pay 100 percent of the cost to construct wastewater facilities needed to protect groundwater. The Groundwater Quality Protection Project – Area D-3 will connect 102 parcels to MSWD's sewer collection and treatment system and abate 81 on-site septic disposal systems.

The lifeblood of Desert Hot Springs economy is water quality. The City's tourist spa industry is tied to its water resources. Further, restaurants and retail stores are dependent on the influx of visitors who come to enjoy the high-quality drinking water as well as the world-renowned hot water that is the foundation of the spa industry. Degradation of either of these water resources would be economically devasting to the City.

It is in the best interest of the State of California to assist the CVRWMG and its member Agency, MSWD, in protecting these irreplaceable resources. The City of Desert Hot Springs supports their efforts and urges the Department of Water Resources to ascribe the highest merit to the CVRWMG proposal for MSWD's Groundwater Quality Protection Project – Area D-3 project.

Please do not hesitate to contact me if you have any questions. I can be reached at lrainey@cityofdhs.org or 760-329-6411.

Sincerely,

Luke Rainey
City Manager

County of Riverside

Riverside Office:
4080 Lemon Street, 5th Floor
Riverside, CA 92502-1647
(951) 955-1040
Fax (951) 955-2194

District Office/Mailing Address
73-710 Fred Waring Drive, Suite 222
Palm Desert, CA 92260-2574
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Fax (760) 863-8905

SUPERVISOR V. MANUEL PEREZ
FOURTH DISTRICT

August 1, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ashley Gilreath:

I write today in support of the proposal submitted by Mission Springs Water District for funding through the Proposition 1, Round 2 Implementation Grant for the Groundwater Quality Protection Project – Area D-3 through the Coachella Valley Regional Water Management Group.

The Groundwater Quality Protection Project – Area D-3 will connect 102 parcels in the D-3 area of Desert Hot Springs to Mission Springs Water District's sewer collection and treatment system and abate 81 on-site septic disposal systems.

Expanding the wastewater system infrastructure would be beneficial for our residents, for protection of water quality and the local economy, as well as in supporting water conservation efforts.

For these reasons, as supervisor for Riverside County's Fourth District, I am pleased to support the efforts of Mission Springs Water District to secure state funding for this project. If you have any questions about my support for this project, please don't hesitate to contact me at (760) 863-8211. Thank you for your consideration.

Sincerely,

V. MANUEL PEREZ
Supervisor, Fourth District

VMP:das

City of Palm Springs

Justin Clifton

City Manager

3200 E. Tahquitz Canyon Way • Palm Springs, California 92262
Tel: (760) 322-8350 • Fax: (760) 323-8207 • Web: www.palmspringsca.gov

July 28, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the City of Palm Springs, we are pleased to submit this letter of support for the *Sunrise Recycled Water Connection Project* proposed by Desert Water Agency (DWA) through the Coachella Valley Regional Water Management Group for funding through Proposition 1, Round 2 Implementation Grant.

In 2020, DWA's largest recycled water customer dropped offline, which caused the plant to operate at a reduced capacity. This resulted in more wastewater being percolated rather than being treated and delivered to irrigation customers. The City of Palm Springs is interested in connecting Sunrise Park to recycled water but has not had the resources to pay for the system extension. The project will extend DWA's purple pipe system to serve irrigation needs at Sunrise Park.

Implementation of this project will irrigate roughly 1,000,000 square feet of grass with non-potable water, which will reduce groundwater pumping in the Coachella Valley Region. Additionally, Sunrise Park provides recreational opportunities for the surrounding disadvantaged communities (DACs). Historically, DACs have a lack of access to urban green spaces. By serving the irrigation needs of Sunrise Park, DWA will be ensuring that the surrounding DAC areas have access to urban green spaces.

Please do not hesitate to contact me if you have any questions. I can be reached at Justin.Clifton@Palmspringsca.gov or 760-322-8362.

Sincerely,

Justin Clifton, City Manager

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FAX (760) 355-8856

Assembly
California Legislature

EDUARDO GARCIA
ASSEMBLYMEMBER, FIFTY-SIXTH DISTRICT

STANDING COMMITEES

CHAIR: UTILITIES AND ENGERY

APPROPRIATIONS
COMMUNICATIONS AND CONVEYANCE
GOVERNMENTAL ORGANIZATION

August 4, 2022

Ashley Gilreath

Round 2 IRWM Implementation Grant Program Manager

California Department of Water Resources

P.O. Box 942836

Sacramento, CA 94236

Dear Ms. Gilreath,

I am proud to offer this this letter of support for the *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal.*

The *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal* includes six projects that improve the overall water supply reliability and water quality of the Coachella Valley Region while simultaneously proving benefits too many disadvantaged communities (DACs).

The *Reservoirs 4711-3 and 4711-4 Project* will construct two 1 million-gallon (MG) aboveground welded-steel tanks and subsequently demolish the existing 100,000-gallon aboveground bolted tanks. The existing tanks have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This deficiency exposes the Indio Hills community to water insecurities and results in poor water supply reliability as low pressure can pull contaminants into the pipe distribution system negatively affecting water quality and decreasing the system's fire suppression readiness. The proposed project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, which is a DAC.

The *Regional Grass Replacement & Study Project* will reduce water demands for outdoor irrigation by removing turf and replacing it with desert landscaping. DAC residents in the CVRWMG's service area will directly benefit from the turf replacements. Water savings provided by the project directly translate into cost savings to DACs by reducing water bills. Additionally, the conservation study portion of the project will guide the CVRWMG to quantify grass replacement program water savings that account for local conditions and practices.

The *Groundwater Quality Protection Project – Area D-3* will protect groundwater quality in the City of Desert of Hot Springs (Desert Hot Springs). As the lowest median income city in Riverside County, Desert Hot Springs is home to families that are unable to pay 100 percent of the cost to construct wastewater facilities needed to protect groundwater. The project will connect 102 parcels to Mission Springs Water District's sewer collection and treatment system and abate 81 on-site septic disposal systems.

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EDUARDO GARCIA
ASSEMBLYMEMBER, FIFTY-SIXTH DISTRICT

STANDING COMMITEES

CHAIR: UTILITIES AND ENGERY

APPROPRIATIONS
COMMUNICATIONS AND CONVEYANCE
GOVERNMENTAL ORGANIZATION

The *Coachella Water Authority (CWA) Groundwater Well Project* will construct one new groundwater well. This will increase CWA's overall capacity, improve operational flexibility by increasing the number of wells CWA has access to and can pump as needed to meet demands, and assist CWA in responding to drought impacts within its service area. CWA is in the process of consolidating small water systems (SWSs). These SWSs often have poor water quality and reliability, lack of redundancy and are often DACs. The project will ensure SWSs have access to safe, reliable water supply.

The *Polanco Septic Rehabilitation Project* will rehabilitate a total of 10 septic tanks in two mobile home parks (MHPs) which are located within a designated DAC in the Eastern Coachella Valley, Aging or failing septic systems have been cited as serious public health concern and potential source of water quality constituents in groundwater and surface water. Rehabilitating the 10 septic tanks will protect groundwater quality by reducing approximately four tons per year of total suspended solids, bacteria, and other wastewater contaminants and will also provide the two MHPs with safe, reliable water supply.

The Sunrise Recycled Water Connection project will extend Desert Water Agency's purple pipe system to serve the irrigation needs at Sunrise Park. Implementation of this project will irrigate roughly 1,000,000 square feet of grass at Sunrise Park with non-potable water. By irrigating Sunrise Park with non-potable water, it will offset the use of groundwater water in the Coachella Valley, which will result in more groundwater available for storage.

Implementation of these projects will greatly benefit the Coachella Valley and provide substantial water supply and water quality benefits. Given ongoing drought conditions the importance of water reliability cannot be overstated, for that reason I strongly recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Thank you for your time and consideration. If you have any questions regarding this letter or the immeasurable benefits this project will bring, please feel free to contact my office at (760) 347-2360.

Sincerely,

Eduardo Garcia
Assemblymember, 56th District

Cathedral City

July 27, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the City of Cathedral City, we are pleased to submit this letter of support for the *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal.*
The *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal* includes six projects that improve the overall water supply reliability and water quality of the Coachella Valley Region and provide benefits to many disadvantaged communities (DACs).

The *Reservoirs 4711-3 and 4711-4 Project* will construct two 1 million-gallon (MG) aboveground welded-steel tanks and subsequently demolish the existing 100,000 gallon aboveground bolted tanks. The existing tanks have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This deficiency exposes the Indio Hills community to water insecurities and results in poor water supply reliability as low pressure can pull contaminants into the pipe distribution system negatively impacting water quality and decreasing the system's fire suppression readiness. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, which is a DAC.

The *Regional Grass Replacement & Study Project* will reduce water demands for outdoor irrigation by removing turf and replacing it with desert landscaping. DAC residents in the CVRWMG's service area will directly benefit from the turf replacements. Water savings provided by the project directly translate into cost savings to DACs by reducing water bills. Additionally, the conservation study portion of the project will guide the CVRWMG to quantify grass replacement program water savings that account for local conditions and practices.

The *Groundwater Quality Protection Project – Area D-3* will protect groundwater quality in the City of Desert of Hot Springs (Desert Hot Springs). As the lowest median income city in Riverside County, Desert Hot Springs is home to families that are unable to pay 100 percent of the cost to construct wastewater facilities needed to protect groundwater. The project will connect 102 parcels to Mission Springs Water District's sewer collection and treatment system and abate 81 on-site septic disposal systems.

The *Coachella Water Authority (CWA) Groundwater Well Project* will construct one new groundwater well. This will increase CWA's overall capacity, improve operational flexibility by increasing the number of wells CWA has access to and can pump as needed to meet demands, and assist CWA in responding to drought impacts within its service area. CWA is in the process of consolidating small water systems (SWSs). These SWSs often have poor water quality and reliability, lack of redundancy and are often DACs. The project will ensure SWSs have access to safe, reliable water supply.

The *Polanco Septic Rehabilitation Project* will rehabilitate a total of 10 septic tanks in two mobile home parks (MHPs) which are located within a designated DAC in Eastern Coachella Valley, Aging or failing septic systems have been cited as serious public health concern and potential source of water quality constituents in groundwater and surface water. Rehabilitating the 10 septic tanks will protect groundwater quality by reducing approximately four tons per year of total suspended solids, bacteria, and other wastewater contaminants and will also provide the two MHPs with safe, reliable water supply.

The Sunrise Recycled Water Connection project will extend Desert Water Agency's purple pipe system to serve the irrigation needs at Sunrise Park. Implementation of this project will irrigate roughly 1,000,000 square feet of grass at Sunrise Park with non-potable water. By irrigating Sunrise Park with non-potable water, it will offset the use of groundwater water in Coachella Valley, which will result in more groundwater available for storage.

Implementation of these projects will greatly benefit Coachella Valley and provide substantial water supply and water quality benefits. We recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Please do not hesitate to contact me if you have any questions. I can be reached at alee@cathedralcity.gov or (760)-770-0319.

Sincerely,

The City of Cathedral City

RAUL RUIZ, M.D.
Member of Congress
36th District of California

Congress of the United States
House of Representatives
Washington, DC 20515-3605

Washington, D.C. Office:
2342 Rayburn House
Office Building
Washington, D.C. 20515
Phone: 202-225-5330

August 3, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Letter of Support: Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal

Dear Ms. Gilreath,

I write in support of the Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal submitted by the Coachella Valley Regional Water Group. This proposal will allow for the development of six individual projects that will improve the water supply and water quality for many disadvantaged communities throughout the Coachella Valley.

The Coachella Valley IRWM Proposal's six community projects each focus on rehabilitation and repair of existing water infrastructure systems throughout the region. These include the replacement of corroded reservoirs, installation of desert landscaping in place of turf, connection of groundwater septic and well systems, rehabilitation of septic tanks in mobile home parks, and extension of pipe systems. Each project will directly improve the reliability of water infrastructure for disadvantaged communities in the region.

As the Representative of California's 36th Congressional District, I understand the urgent need for improved water infrastructure in the Coachella Valley area. The area is drought-prone and home to several underserved communities. Through these programs, local businesses and residents in the region will be granted improved water supply reliability and sustainability for years to come.

The Coachella Valley IRWM Proposition 1 Round 2 Implementation Grant Proposal is a worthy candidate for your grant funding. I support their efforts and urge full and fair consideration of

their application, consistent with all relevant program rules and regulations. If you have any additional questions, please feel free to contact my congressional office at 760-424-8888.

Sincerely,



Raul Ruiz, M.D.
Member of Congress

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45-125 SMURR STREET
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California State Senate

SENATOR
MELISSA A. MELENDEZ
TWENTY-EIGHTH SENATE DISTRICT

COMMITTEES
HEALTH
VICE CHAIR
HUMAN SERVICES
TRANSPORTATION

SUBCOMMITTEE
BUDGET
SUBCOMMITTEE #3
ON HEALTH & HUMAN
SERVICES

July 30, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ms. Gilreath,

On behalf of the California 28th Senate District, we are pleased to submit this letter of support for the *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal.*

The *2022 Coachella Valley Integrated Regional Water Management (IRWM) Proposition 1 Round 2 Implementation Grant Proposal* includes six projects that improve the overall water supply reliability and water quality of the Coachella Valley Region and provide benefits to many disadvantaged communities (DACs).

The *Reservoirs 4711-3 and 4711-4 Project* will construct two 1 million-gallon (MG) aboveground welded-steel tanks and subsequently demolish the existing 100,000 gallon aboveground bolted tanks. The existing tanks have developed moderate-to-severe corrosion along their bolt seams and no longer provide reliable water storage. The Indio Hills Pressure Zone currently has a water storage capacity deficiency of approximately 1.4 MG. This deficiency exposes the Indio Hills community to water insecurities and results in poor water supply reliability as low pressure can pull contaminants into the pipe distribution system negatively impacting water quality and decreasing the system's fire suppression readiness. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to CVWD's customers within the Sky Valley Domestic Water Production Zone/Indio Hills Pressure Zone, which serves the unincorporated community of Indio Hills, which is a DAC.

The *Regional Grass Replacement & Study Project* will reduce water demands for outdoor irrigation by removing turf and replacing it with desert landscaping. DAC residents in the CVRWMG's service area will directly benefit from the turf replacements. Water savings provided by the project directly translate into cost savings to DACs by reducing water bills. Additionally, the conservation study portion of the project will guide the CVRWMG to quantify grass replacement program water savings that account for local conditions and practices.

The *Groundwater Quality Protection Project – Area D-3* will protect groundwater quality in the City of Desert of Hot Springs (Desert Hot Springs). As the lowest median income city in Riverside County, Desert Hot Springs is home to families that are unable to pay 100 percent of the cost to construct wastewater facilities needed to protect groundwater. The project will connect 102 parcels to Mission Springs Water District's sewer collection and treatment system and abate 81 on-site septic disposal systems.

The *Coachella Water Authority (CWA) Groundwater Well Project* will construct one new groundwater well. This will increase CWA's overall capacity, improve operational flexibility by increasing the number of wells CWA has access to and can pump as needed to meet demands, and assist CWA in responding to drought impacts within its service area. CWA is in the process of consolidating small water systems (SWSs). These SWSs often have poor water quality and reliability, lack of redundancy and are often DACs. The project will ensure SWSs have access to safe, reliable water supply.

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Implementation of these projects will greatly benefit Coachella Valley and provide substantial water supply and water quality benefits. We recommend the Department of Water Resources fund the *2022 Coachella Valley Integrated Regional Water Management Proposition 1 Round 2 Implementation Grant Proposal.*

Please do not hesitate to contact me if you have any questions. Contact my District Director Glenn Miller at glenn.miller@sen.ca.gov or 760.398.6442.

Sincerely,

Melissa Melendez
California State Senator
28th Senate District

County of Riverside

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SUPERVISOR V. MANUEL PEREZ
FOURTH DISTRICT

August 4, 2022

Ashley Gilreath
Round 2 IRWM Implementation Grant Program Manager
California Department of Water Resources
P.O. Box 942836
Sacramento, CA 94236

Dear Ashley Gilreath:

I write today in support of the proposal submitted by the Coachella Valley Water District and the Coachella Valley Regional Water Management Group for funding through the Proposition 1, Round 2 Implementation Grant for six regional projects and programs in the Coachella Valley.

The following projects included in this proposal would improve the overall water supply reliability and water quality in the Coachella Valley region and provide benefits to many disadvantaged communities (DACs):

The Reservoirs 4711-3 and 4711-4 Project, led by the Coachella Valley Water District, would construct two one million-gallon aboveground welded-steel tanks and subsequently demolish the existing 100,000-gallon aboveground bolted tanks. The project would restore and improve water storage infrastructure and ensure reliable sustainable domestic water supply and fire flow protection to the unincorporated community of Indio Hills, which is a DAC.

The Regional Grass Replacement & Study Project would reduce water demands for outdoor irrigation by removing turf and replacing it with desert landscaping. DAC residents in the service area would directly benefit from the turf replacements and resulting reduced water bills. Additionally, the conservation study portion of the project would guide the Coachella Valley Regional Water Management Group to quantify grass replacement program water savings that account for local conditions and practices.

The Groundwater Quality Protection Project – Area D-3 of the Mission Springs Water District would protect groundwater quality in Desert Hot Springs by connecting 102 parcels to the district's sewer collection and treatment system and abate 81 on-site septic disposal systems.

The Coachella Water Authority's Groundwater Well Project would construct a new groundwater well. This would increase the agency's overall capacity, improve operational flexibility by increasing the number of wells the agency has access to and can pump as needed to meet demands, and assist the agency in responding to drought impacts within its service area. The Coachella Water Authority is in the process of consolidating small water systems, SWSs, which often have poor water quality and reliability, lack of redundance and often are DACs. The project would ensure SWSs have access to a safe, reliable water supply.

The Polanco Septic Rehabilitation Project would rehabilitate 10 septic tanks at two mobile home parks, located within a designated DAC in the eastern Coachella Valley. Aging or failing septic systems have been cited as a serious public health concern. Rehabilitating the 10 septic tanks would protect groundwater quality by reducing approximately four tons per year of total suspended solids, bacteria and other wastewater contaminants.

Lastly, the Sunrise Recycled Water Connection project would extend the Desert Water Agency's recycled water system to serve the irrigation needs at Sunrise Park in Palm Springs. By irrigating Sunrise Park with non-potable water, the project would offset the use of groundwater in the Coachella Valley, resulting in more groundwater available for storage.

As supervisor for Riverside County's Fourth District, representing the Coachella Valley and the eastern two-thirds of Riverside County, I applaud the Coachella Valley Regional Water Management Group for putting together this excellent slate of projects, spread across the Coachella Valley, that addresses issues of water supply, water quality and water conservation, and provides substantial benefits and improvements for disadvantaged communities. For these reasons, I am pleased to support the Coachella Valley Water District and our local water agencies in securing state funding for these efforts.

If you have any questions about my support for this proposal, please don't hesitate to contact me at (760) 863-8211. Thank you for your consideration.

Sincerely,

V. MANUEL PEREZ
Supervisor, Fourth District

VMP:das

Attachment
6

Coachella Valley Integrated Regional Water Management
2022 IRWM Implementation Grant Proposal
Climate Change

Attachment 6 consists of the following items:

- ✓ **Contact Person for Climate Change.** Coachella Valley Water District's (CVWD's) climate change contact.
- ✓ **Strategic Business Plan.** An overview of the CVWD *2020-2021 Strategic Business Plan* to assist CVWD in providing a safe, reliable water supply to the region.
- ✓ **Policies and Public Statements.** An overview of CVWD's adopted policies and formal public statements regarding climate change.
- ✓ **Climate Change Vulnerability Assessment.** An overview of the climate change vulnerability analysis completed as part of the *2018 Coachella Valley Integrated Regional Water Management and Stormwater Resource Plan (IRWM/SWR).*
- ✓ **Adaptation Capacity.** An overview of CVWD's capacity to adapt to the impacts of climate change.

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Formal Policies and Public Statements 3
Climate Change Vulnerability Assessment 3
Adaptation Capacity 7

Contact Person for Climate Change

CVWD's primary point of contact for climate change is William Patterson, the District's Environmental Supervisor. William led development of CVWD's Climate Action & Adaptation Plan as well as other climate change-related tasks.

- William Patterson
  Environmental Supervisor
  WPatterson@cvwd.org
  (760) 398-2661, ext. 2545

Strategic Business Plan

The primary climate change threats to the Coachella Valley are reduction in groundwater quality and quantity, and reduced availability of imported water supplies. Coachella Valley Water District (CVWD) has a *2020 - 2021 Strategic Plan* (**Appendix 6-1**) whose main goal is to meet the water-related needs of the people through dedicated employees, providing high quality water at a reasonable cost.[1] CVWD's strategic business goals include: exceptional customer service and stakeholder engagement, water quality and environmental leadership, water supply optimization, infrastructure investment and management, operational optimization, and financial viability.

Several significant, external issues influenced the development of CVWD's strategic goals. CVWD holds entitlements to both the Colorado River and the State Water Project. However, droughts within California's Sierra Nevada and the Colorado River Basin have resulted in mandated conservation goals and water-use restrictions, which included goals and restrictions on the Coachella Valley Regional Water Management Group (CVRWMG) member agencies. To implement its strategic goals associated with water supply sustainability, water quality and environmental leadership, and infrastructure investment, CVWD serves as a leader in regional water management and conservation planning.

Therefore, to abide by the state mandate and recognize the importance of conserving water, the *2020 Coachella Valley Regional Urban Water Management Plan* was developed to forecast the water demands and water supplies for the next 20 years and assess the reliability of water supplies during drought periods. Following the passage of the Sustainable Groundwater Management Act (SGMA), CVWD, Coachella Water Authority (CWA), Desert Water Agency (DWA), and Indio Water Authority (IWA) submitted application materials to become Groundwater Sustainability Agencies (GSAs) for the Indio Subbasin. CVWD and DWA submitted application materials to became GSAs for the Mission Creek Subbasin and have worked together with Mission Springs Water District (MSWD) as the Mission Creek Subbasin Management Committee to manage the Mission Creek Subbasin. In January 2017, the GSAs collaboratively submitted *the 2010 Coachella Valley Water Management Plan*, the *2016 SGMA Alternative Groundwater Sustainability Plan Bridge Document* and other supporting documents for Indio Subbasin. The Mission Creek Management Committee submitted the *2013 Mission Creek – Garnet Hill Water Management Plan,* the *2016 SGMA Alternative Groundwater Sustainability Plan Bridge Document* and other supporting documents for the Mission Creek Subbasin. Both Alternative Plans were approved by DWR on July 17, 2019. With this approval, DWR made several recommendations for new information and a requirement that the first Alternative Plan Update for both subbasins be prepared by January 1, 2022. In December 2021, the *2022 Indio Subbasin Water Management Plan Update* and the *2022 Mission Creek Subbasin Alternative Plan Update* were submitted to DWR.

The Strategic Plan identified projects and management actions that would align with CVWD's goals including the development of a Climate Action & Adaptation Plan. One of the most important goals is achieving water supply sustainability due to droughts within California's Sierra Nevada and the Colorado River Basin. To achieve this goal, CVWD and the other GSAs will maintain groundwater levels within the Coachella Valley aquifer by implementing strategies in the *2022 Indio Subbasin Water Management Plan Update* and the *2022 Mission Creek Subbasin Alternative Plan Update* and updating and complying with the water management plans mentioned above.

[1] Coachella Valley Water District. 2020. *Strategic Plan*.

Formal Policies and Public Statements

CVWD has adopted policies and made formal public statements about climate change (see **Appendix 6-2**). Some of the most notable recent examples include:

- Built the regional water management strategy in the *2022 Indio Subbasin Water Management Plan Update* and the *2022 Mission Creek Subbasin Alternative Plan Update*, along with the other GSAs and management committee agencies, on a climate change scenario that incorporates forecast watershed hydrology with reoccurring multi-year dry conditions similar to the 2014-2018 drought, as well as both State and federal climate change assumptions regarding future reductions in available water supply. Both plans clearly explain the water supply threats of future climate change and how the regional water management strategy responds to those threats.
- Developed and adopted the *2021 Climate Action & Adaptation Plan* (CAAP) to lay out the District's comprehensive approach to responding to climate change, reducing greenhouse gas emissions over time, and increasing the District's adaptive capacity. CVWD's CAAP identifies greenhouse gas emission reduction measures based on the State of California regulations and programs related to climate change and includes an inventory of existing, historic, and projected greenhouse gas emissions and a suite of measures to reduce emissions, increase climate resiliency, and meet the plan's objectives.
- Ongoing participation in CV Water Counts, a coalition of all five water purveyors in the Coachella Valley (CVWD, CWA, DWA, IWA, MSWD), focused on water conservation through awareness and education to Coachella Valley residents, businesses, and government.
- Hosting free conservation events that are designed for Coachella Valley residents who want to learn more about water-efficient irrigation, desert horticulture, and how to better manage their water use.
- Offering a temporary and compensated water conservation program for agricultural irrigators that can demonstrate a reduction in Colorado River water use for 2022-2023. Participants will be incentivized $200/AF (net) based on savings against their historical water use over the most recent 5-year period.
- Creating and updating a variety of long-term plans by coordinating with the other CVRWMG agencies to meet future water demand and address environmental goals. Climate change is addressed in CVWD's CAAP, *2020 Coachella Valley Regional Urban Water Management Plan*, and CVWD's *Water Shortage Contingency Plan.*

Climate Change Vulnerability Assessment

The Climate Change Handbook for Regional Water Planning (DWR 2011) is intended to help local agencies, cities, and counties include climate change as part of their water resources planning. As part of the suggested process, the Climate Change Handbook recommends regions identify strategies that can be used to help them to adapt to climate change as well as mitigate greenhouse gas (GHG) emissions. The *2009 California Climate Adaptation Strategy Handbook* (CNRA 2009) defines climate change adaptation as adjustments to the natural or human systems due to actual or expected climate changes in an effort to minimize harm or take advantage of beneficial opportunities, while climate change mitigation aims at directly reducing the GHG emissions that cause climate change through energy efficiency, emissions reduction, and/or carbon sequestration.

The CVRWMG completed a climate change vulnerability assessment as part of its *2018 Coachella Valley IRWM/SWR Plan Update.* This update used DWR's Climate Change Handbook and CNRA's Climate Adaptation Strategy Handbook, along with additional climate change related documents, to identify water management strategies that address climate change vulnerability issues and mitigate GHG emissions. Prioritization was given to strategies that could provide answers to the following questions:

- Is the strategy a "no regret" strategy?
- Does the strategy help to adapt to the vulnerability issues identified and evaluated in *Section 3.2.3 Vulnerability Analysis* of the *2018 Coachella Valley IRWM/SWR Plan Update*?
- Does the strategy help the Region mitigate GHGs?

In *Chapter 3 Issues and Needs* of the *2018 Coachella Valley IRWM/SWR Plan Update* (**Appendix 6-3**), the Coachella Valley Region created models to project climate change impacts to water supplies and infrastructure.

Generally, climate change is expected to increase temperatures, with little to no change in average rainfall, and therefore increase water demand due to higher irrigation needs.

Imported water from the Colorado River Aqueduct (for SWP exchange water) and Coachella Canal (for Colorado River water) may be impacted by decreased flows in the Colorado River because projections show up to a 20% decrease in the River's flow (Hoerling et al. 2009). Additionally, decreased snowpack in the Sierra Nevada mountains results in reduced allocations of SWP supplies. Climate change may also slightly increase the frequency of wildfires. Increases in wildfires have the potential to increase sedimentation and turbidity of surface waters and increase flash flooding (Lenihan et al. 2008). By knowing these projected climate change impacts, vulnerabilities can be prioritized and implemented using best management practices. The vulnerability issues found in **Table 6-1** are considered to be unique aspects of the Coachella Valley Region.

Table 6-1: Prioritized Climate Change Vulnerability Issues

Priority Level	Category and Vulnerability Issue
High	• Water Demand: Crop water demand would increase • Water Supply: Decrease in imported supply • Flooding: Increases in inland flooding
Medium	• Water Demand: Lack of groundwater storage to buffer drought • Water Demand: Limited ability to conserve further • Water Demand: Limited ability to meet summer demand • Water Supply: Invasive species can reduce the supply available
Low	• Water Demand: Industrial demand would increase • Water Supply: Decrease in local surface supply • Water Supply: Decrease in groundwater supply • Water Quality: Increased erosion and sedimentation due to wildfires • Ecosystem and Habitat: Increased impacts to water dependent species • Ecosystem and Habitat: Decrease in available unnecessary habitat

Source: CVRWMG, 2018, *Coachella Valley IRWM/SWR Plan Update*.

In the climate change vulnerability assessment, the highest ranked vulnerabilities were considered to be increased crop water demand, decreased water supply, and increased inland flooding. With the expected increase in temperatures, there will be an increase in crop irrigation demands, which could in turn increase supply costs. Given the Region's limited local water supplies, a decrease in imported supply could have a significant impact on the Region. Even though Colorado River water supplies are relatively secure, it is expected that the average reliability of the Colorado River's flow will be impacted by variations in precipitation and snowpack. Additionally, the Sierra Nevada will likely be impacted by greater precipitation and the Sacramento-San Joaquin River Delta will likely be impacted by sea level rise, which together will affect the reliability of SWP allocations. Lastly, it is predicted that there will be an increase in inland flooding due to more extreme storms, which will put the Region's critical water infrastructure found in the 200-year flood plain at risk.

As stated above, some of these climate change vulnerability issues can already be addressed by climate strategies that have a "no regret" implementation. The Projects discussed in this application will help reduce water demand and protect groundwater quality throughout different areas of the Region, both of which help to improve water supply reliability. By addressing climate change concerns through these Projects, there is a better chance to mitigate climate change impacts in the future.

The climate strategies, listed in **Table 6-2**, were created to be help the Coachella Valley Region respond to and reduce potential climate change vulnerabilities. Several of these strategies address reducing energy consumption, even when not explicitly stated. The Region has also been implementing water use efficiency strategies, which

has significantly reduced the overall gallons per capita per day throughout the Region. The amount of imported water needed reduces when urban water demands are reduced, which in turn, reduces energy consumption and GHGs.

Table 6-2 Climate Change Management Strategies

	Implemented in Region?	No regret strategy?	Help to adapt to climate change vulnerabilities?	Help to mitigate GHGs?
Reduce Water Demand				
Agricultural Water Use Efficiency	Yes	Yes	Yes	Yes
Urban Water Use Efficiency	Yes	Yes	Yes	Yes
Water Meter Installation[1]	Yes	Yes	Yes	Yes
Improve Operational Efficiency and Transfers				
Conveyance – Delta	Yes	Yes	Yes	Yes
Conveyance – Regional/Local	Yes	Yes	Yes	Yes
System Reoperation	Yes	Yes	Yes	Yes
Water Transfers	Yes	Yes	Yes	
Conduct emissions inventories[1]	Yes	Yes	-	Yes
Increase use of renewable energy sources[1]	Yes	-	-	Yes
Localized (or decentralized) water/wastewater treatment[1]	No	-	-	Yes
Shift water use to off-peak hours[1]	No	Yes	Yes	-
Optimize sewer systems[1]	Yes		Yes	-
Increase Water Supply-				
Conjunctive Management and Groundwater Storage (including Stormwater Retention Basin)	Yes	Yes	Yes	-
Desalination	Yes	-	Yes	-
Precipitation Enhancement	Yes		Yes	Yes
Recycled Municipal Water	Yes	Yes	Yes	Yes
Surface Storage – CALFED	Yes	-	Yes	Yes
Surface Storage – Regional/Local	Yes	-	Yes	Yes
Improve Water Quality				
Drinking Water Treatment and Distribution	Yes	Yes	Yes	-
Groundwater Remediation/Aquifer Remediation	Yes	Yes	Yes	-
Matching Quality to Use	Yes	Yes	Yes	Yes
Pollution Prevention	Yes	Yes	Yes	Yes
Salt and Salinity Management	Yes	Yes	Yes	Yes
Urban Runoff Management[2]	Yes	Yes	Yes	Yes
Improve Flood Management				
Flood Management[2]	Yes	Yes	Yes	-

	Implemented in Region?	No regret strategy?	Help to adapt to climate change vulnerabilities?	Help to mitigate GHGs?
Integrated Flood Management[2]	No	Yes	Yes	-
Protective Infrastructure[1]	Yes	-	Yes	-
Sediment Management[1]	No	-	Yes	-
Practice Resources Stewardship				
Agricultural Lands Stewardship	Yes	Yes	Yes	Yes
Ecosystem Restoration	Yes	Yes	Yes	Yes
Forest Management	Yes	Yes	Yes	Yes
Recharge Area Protection	Yes	Yes	Yes	Yes
Watershed Management	Yes	Yes	Yes	Yes
People & Water				
Economic Incentives (Loans, Grants and Water Pricing)	Yes	Yes	Yes	Yes
Outreach and Engagement	Yes	Yes	Yes	-
Water and Culture	Yes	Yes	-	-
Water-Dependent Recreation	Yes	Yes	-	-
Other Strategies				
Crop idling, dewvaporation, fog collection, irrigated land retirement, rainfed agriculture, and waterbag transport	No	No	No	No

[1] Indicates an additional strategy (not an RMS identified in the *2013 California Water Plan Update*) that was considered as a potential additional strategy that could be implemented to address climate change.

[2] Stormwater retention is included in the Urban Runoff Management, Flood Management and Integrated Flood Management plans.

These strategies were designed to complement each other when implemented so that participating water purveyors can help fully achieve the strategies' goals. The different strategies focus on reducing water demand, improving operational efficiency and transfers, increasing water supply, improving water quality, improving flood management, practicing resource stewardship, reconnecting people with water, and other strategies. Reducing water demand for the Region will be implemented through improving agricultural water use efficiency through irrigation technology, monitoring, and education and improving urban water use efficiency, installing water efficient landscapes, and education.

Some of these strategies are "no regret" strategies, which means that if implemented, these strategies would provide benefits today regardless of potential climate change impacts and would reduce the Region's vulnerability to potential future climate change impacts. The "no regret" strategies are desirable for immediate implementation. Additional strategies that were determined to not be appropriate for the Region are discussed in *Section 8.2 Resource Management Strategies* in the *2018 Coachella Valley IRWM/SWR Plan Update*. The set of strategies found in **Table 6-2** will best help the Region in responding to and reducing potential climate change vulnerabilities given current knowledge.

Many of these strategies were incorporated into the regional water management strategy in the *2022 Indio Subbasin Water Management Plan Update* and the *2022 Mission Creek Subbasin Alternative Plan Update*. Those water management plans lay out the projects and programs that will ensure supply reliability, basin sustainability, and climate adaptability over the 25-year planning horizon.

Adaptation Capacity

CVWD's mission is to provide high quality water to the Coachella Valley region at a reasonable cost, but the District has recognized how climate change may potentially impact its mission. In September 2021, CVWD adopted its CAAP. The goal of the CAAP is to guide CVWD towards long-term emissions and adaptation to climate change impacts in alignment with the State of California goals, mandates, and current legislation. The CAAP has identified potential climate vulnerabilities that may impact CVWD's operations and infrastructure, which include reduced quality and supply of water from the Colorado River, increased frequency and intensity of floods, increased risk of wildfires, and increased temperatures and extreme heat events. To adapt to these potential effects, the CAAP has identified projects that reduce GHG emissions and improve energy and water supply resiliency. The plan also helps CVWD obtain the funding necessary to implement such projects and further support CVWD's mission of providing high-quality water to the Region at a reasonable cost.

Furthermore, the projects included in this Proposal increase CVWD and Coachella Valley's capacity to adapt to the climate change impacts mentioned above:

- **The Reservoirs 4711-3 and 4711-4 Project** will construct two new 1-million gallon above ground water reservoirs that will alleviate water storage deficiency in the Indio Hills Pressure Zone. The project will improve the overall water supply reliability for the Indio Hills Pressure Zone and its end-users, providing redundancy. The project will also make the Indio Hills disadvantaged community more resilient to water scarcity issues by creating a more regionally independent water storage system as well as improve fire flow reliability in the area.
- **The Regional Grass Replacement Program, Mission Springs Water District Demonstration Garden, and Regional Conservation Study Project** will provide turf rebates throughout CVRWMG's service area for a variety of water customers, demonstrate water efficient irrigation techniques, and develop a decision support tool to examine water savings of Coachella Valley conservation programs. The project will reduce water use in the region by replacing water-intensive turf with low water use landscapes. The water savings will alleviate groundwater pumping, resulting in more water storage to prepare for prolonged drought periods.
- **The Groundwater Quality Protection Project – Area D-3** will connect 102 parcels to Mission Springs Water District's sewer system and abate 81 on-site septic systems. Optimizing sewer systems is a climate change strategy that helps to adapt to climate change. Many of these small septic systems are failing and contaminating the surrounding land and precious groundwater resources below. Protecting local groundwater supplies reduces the need for costly supplemental and imported water supplies.
- **The Coachella Water Authority Groundwater Well Project** will construct a groundwater well to provide additional potable supply to CWA's system. The project will address existing water supply challenges and builds local resilience should drought conditions continue by ensuring small water systems can access a high quality, reliable water supply. The project will alleviate small water systems' susceptibility to drought conditions by adding redundancy to their water supply systems, as many lack the ability to purchase alternative water supplies, drill deeper wells, or repair wells should issues arise.
- **The Polanco Septic Rehabilitation Project** will install 10 new septic systems to two mobile home parks. The project will protect groundwater quality by reducing the pollutant loading of bacteria and solids, ensuring that the Region will have high quality groundwater and reducing the need for costly supplemental and imported water supplies.
- **The Sunrise Park Recycled Water Connection Project** will extend DWA's purple pipe system to serve irrigation needs at Sunrise Park. Sunrise Park has roughly 1 million square feet of grass, which is water-intensive. By utilizing recycled water for irrigation, the project will offset the use of groundwater, resulting in more storage during prolonged drought periods.

COACHELLA VALLEY WATER DISTRICT

2020-2021

STRATEGIC PLAN









ADOPTED 2020

WATER DISTRICT

YourWater is our promise

FlowingForward

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General Manager
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YourWater is our promise



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CVWD Employee Creed 30

Our Mission



To meet the water-related needs of the people through dedicated employees, providing high quality water at a reasonable cost.





Message from the General Manager

2020 has been a challenging year for many, Coachella Valley Water District included. The global pandemic has changed the way many of us operate, but CVWD has remained committed to providing our community with essential services during this time. Though our Strategic Planning efforts began before the pandemic, we have not allowed the situation to dissuade us from moving forward with our initiatives. Strategic planning is a disciplined effort to produce fundamental decisions and actions that shape and guide an organization, what it does, and why. Now, more than ever, we want to move forward with the intentions we have outlined through our planning.

The intent of Strategic Planning is understanding that some organizational decisions and actions take precedence over others. Determining which rise to higher levels of prioritization is done through this focused and deliberative action. That action leads to successful implementation of projects and programs that benefit our customers and ultimately our organization.

Strategic Planning efforts help to guide the District's leadership and staff as we strive to meet the water-related needs of our community. We took a break in 2019-2020 to allow staff, management and the Board of Directors to refresh and with the hope that we could return to the process with a new outlook. This year's plan builds upon the progress we have made through Strategic Planning since 2014 and created an opportunity for new ideas.

Development of the Strategic Plan was a collaborative and transparent process that included elected members of the Board of Directors and employees representing every department within the District. Under the guidance of a professional strategic planning firm, this group met for two day-long workshops that were open to the public.

During the workshops, 29 initiatives were proposed, evaluated and discussed. Through a prioritization process, which evaluated the feasibility and return of each, 19 initiatives were selected and are outlined on pages 20-28

This document reviews the 2018-2019 plan's accomplishments and outlines this year's expectations. It is a plan for today and for the future. Your Water is Our Promise.

Sincerely,

Jim Barrett
General Manager

Coachella Valley Water District at a glance



Coachella Valley Water District (CVWD) is a special district established in 1918 by the state legislature and governed by a five-member Board of Directors elected to four-year terms by District voters.

Today, CVWD has grown into a multi-faceted agency with nearly 569 employees working to provide a variety of water-related utility services to more than 300,000 people in the Coachella Valley.

The primary fields of service are:

1. Domestic/drinking water treatment and distribution to approximately 108,000 homes and businesses. All of the drinking water supplied by CVWD comes from the groundwater basin.

2. Irrigation water importation and distribution. The 123-mile Coachella Canal provides Colorado River water to local farmers and golf courses in the eastern Coachella Valley.

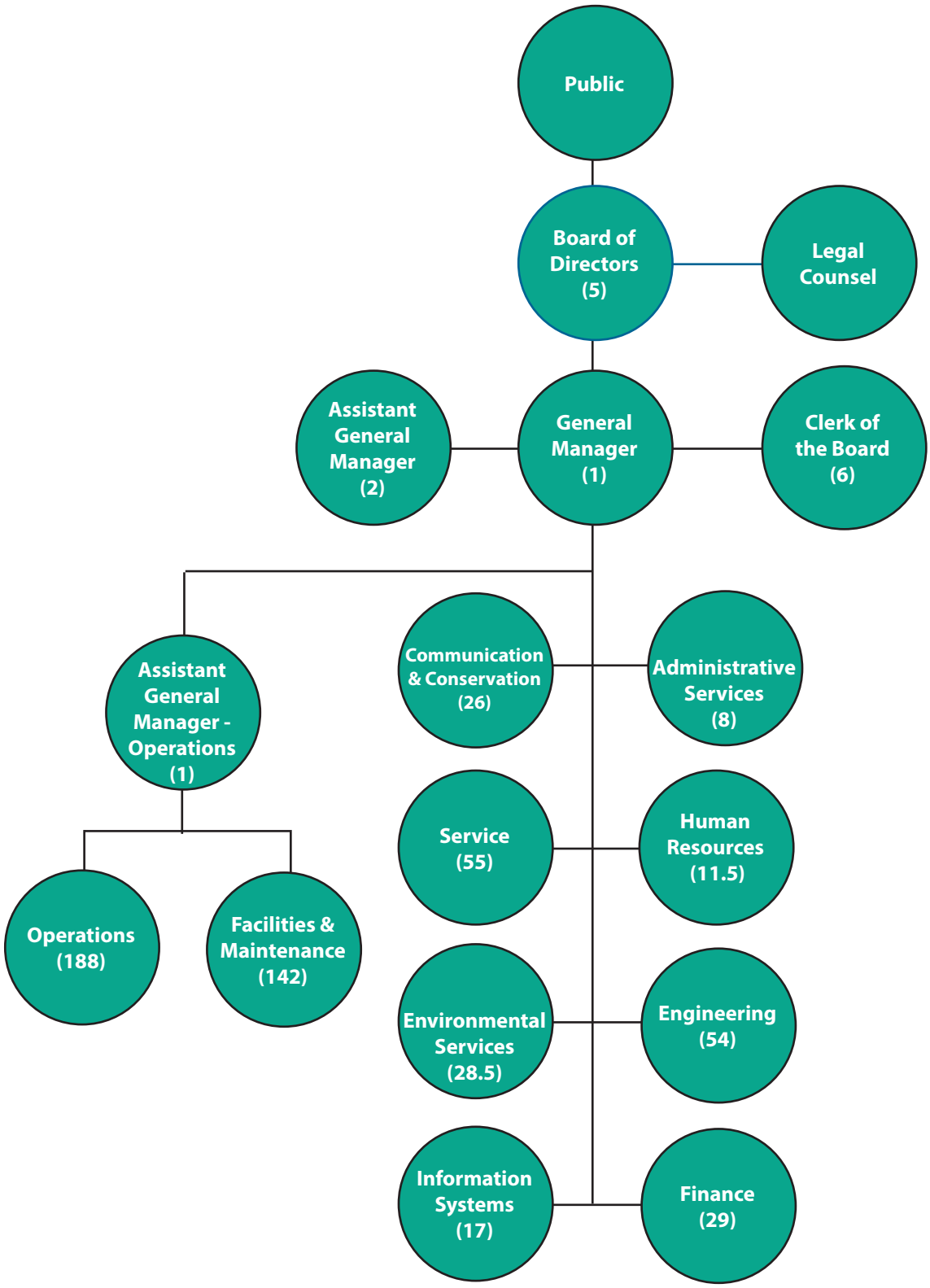
3. Wastewater collection and treatment. The District owns and operates five wastewater reclamation plants that receive a combined average of 17 million gallons of wastewater per day.

4. Recycled water distribution. Treated wastewater is distributed to golf courses and other customers for landscape irrigation.

5. Groundwater management. CVWD replenishes the groundwater supply at four different facilities in the Coachella Valley. At two of the locations, the effort is collaborative with Desert Water Agency (DWA).

6. Regional stormwater and flood protection. The District protects nearly 600 square miles from flooding through a system that includes 16 stormwater protection channels.

Organizational Structure



Note: Numbers within the chart reflect actual staffing levels as of June 30, 2020.

Community profile



The Coachella Valley extends approximately 45 miles in Riverside County, southeast from the San Bernardino Mountains to the Salton Sea. The Valley is approximately 15 miles wide and surrounded by scenic, rugged mountains along most of its length.

The Valley is located within the Colorado Desert, a subdivision of the Sonoran Desert, with average daily highs ranging from 71 to 107 degrees and average nightly lows from 44 to 80 degrees. Most of the nearly 3.5 inches of annual rain received falls in December through February with some rainfall also being received in August as monsoonal weather patterns move in from the south.

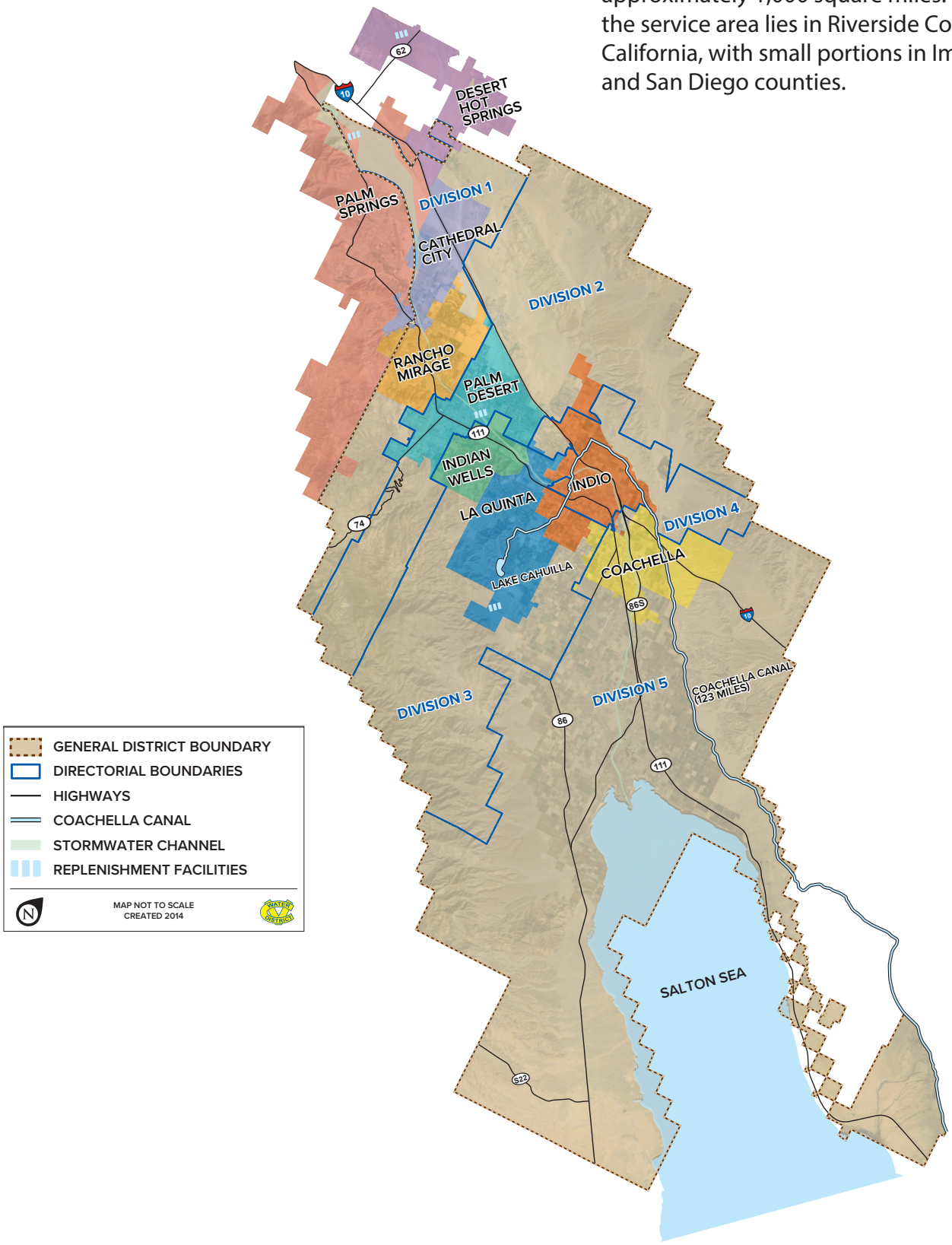
Elevations on the Valley floor range from 1,600 feet at the northwest end of the Valley, to 250 feet below sea level at the southeast end of the Valley.

The Valley's year-round population is approximately 364,987 (California Department of Finance, 2017) but this figure increases significantly during the months of November through May with an influx of "snowbirds" escaping the cold winters of Canada, the Pacific Northwest, and the Northeastern United States. When taking seasonal population into account, CVWD serves approximately 300,000 customers.

The Valley is recognized as the golf, tennis and polo capital of the West. It plays host to many internationally known recreational sports, music events and attractions that support tourism and the local economy. Additionally, the Coachella Valley is home to an agricultural industry that employs approximately 12,000 people and produces nearly a billion dollars in agricultural products each year.

Boundary Map

With offices in Palm Desert and Coachella, the District's service area covers approximately 1,000 square miles. Most of the service area lies in Riverside County, California, with small portions in Imperial and San Diego counties.



What is a Strategic Plan?

The Strategic Plan is a tool that defines what is critical to the District's success and the initiatives necessary to guide the District toward achieving its goals. Strategic planning is intended to help decision makers identify initiatives, evaluate priorities, and then put action plans in place to guide an organization.

The strategic goals were identified and considered within the framework of Effective Utility Management (EUM), which was developed by the major water and wastewater organizations in the United States. Effective utility management helps water and wastewater utilities select priorities for improvement based on the unique needs of their communities. The framework addresses operations, infrastructure, customer satisfaction, community welfare, natural resource stewardship, and financial performance.



*The 10 attributes of an effectively managed water utility, as developed by leading industry associations, reflects 2016 revisions.

Issues of concern



Current and emerging issues of concern are a key factor in developing the Strategic Goals. By identifying these issues and pairing them with the Effective Utility Management (EUM) attributes as a reference point, the District can better set priorities. Some of the issues at this time include:

1. Through the foresight of our predecessors in the Valley, CVWD is one of only two California water agencies that holds water rights to both the Colorado River and the State Water Project. However, droughts within California and the Colorado River basin are stark reminders of how vulnerable imported water supplies are to the forces of nature, and that these supplies need to be protected and optimally used. (Water Resource Sustainability).

2. Although the bulk of the District's domestic water system is relatively new, ongoing repairs and replacement projects are required. The Coachella Canal irrigation system is nearing 70 years old, with many of the 485 miles of underground irrigation lines in need of repair or replacement. The District is the main agency that provides stormwater protection for the Coachella Valley and several areas remain unprotected. (Infrastructure Strategy & Performance).

3. CVWD must address the operating and capital needs of the service area while maintaining reasonable rates for services. The District must carefully balance responding to rising costs with maintaining affordable rates. (Financial Stability).

4. As science continues to improve the ability to detect minute levels of constituents, water quality regulations are becoming more and more challenging to agencies like CVWD. CVWD and others continue to advocate for sound science to analyze the potential health impacts of constituents as well as economic analysis of the treatment options. (Water Quality and Environmental Leadership).

5. Within CVWD's boundary, there are small water systems that are not connected to CVWD's domestic water supply. These systems struggle with water quality and water reliability. CVWD formed the Disadvantaged Communities Infrastructure Task Force, whose mission is to secure access to safe affordable drinking water, wastewater and flood control services in historically disadvantaged Coachella Valley regions through strategic planning, funding procurement, needs assessment, and reporting – all in collaboration with community members and stakeholders. The task force is gathering necessary data and applying for grant funding to consolidate these systems with CVWD's. (Community Sustainability and Infrastructure Strategy & Performance).

6. On November 27, 2017 the Supreme Court of the United States denied a request by CVWD and Desert Water Agency to review the legality in the ruling in favor of the Agua Caliente Band of Cahuilla Indians suit against the water districts. The suit claims senior reserved groundwater rights and seeks to permanently stop the water districts from withdrawing groundwater from the aquifer in the western Coachella Valley, and replenishing the aquifer without treating the water first. The second phase of this lawsuit, deciding whether the Tribe owns storage space within the groundwater basins, is currently underway. (Water Resource Sustainability).

7. On April 7, 2017, Gov. Jerry Brown declared the 2014 statewide drought emergency over but put into place long-term conservation goals. Because the Valley is located in a desert, by definition, drought is normal and CVWD has a long history of effective groundwater management planning to ensure future water supplies. The Coachella Valley Water Management Plan details several strategies and projects to eliminate overdraft of the aquifer, including increased conservation, utilization of recycled and imported water for golf and farm irrigation and continued groundwater replenishment. One of CVWD's key tools for groundwater sustainability, in addition to conservation, is imported water for groundwater replenishment and source substitution. (Water Resource Sustainability and Community Sustainability).

8. CVWD's service area covers a wide demographic of customers, and as such, providing opportunities to obtain their input on various water-related issues is important to the continued success of the District. CVWD offers different venues to educate our customers and stakeholders and also to obtain their input, including Board meetings, tours, events with CVWD-staffed booths, and stakeholder meetings. CVWD staff looks for new ways provide information to the community, and to also obtain their input. (Stakeholder Engagement).

9. Similar to other utilities, CVWD is confronting an aging workforce. Approximately 100 people have retired from CVWD in the last five years and more employees are eligible to retire in the next five years. A continuing focus on knowledge transfer, recruitment, and retention is critical to ensure an educated and skilled workforce is available to provide reliable water-related services to our customers. (Workforce Development).

SWOT Analysis

A SWOT analysis was performed by staff and board members to analyze the Strengths, Weaknesses, Opportunities and Threats across the District. Many themes and topics were raised during the analysis but the top three from each section were chosen. The final results of the analysis helped to develop the District's initiatives for 2020-2021.



Budgeting



Budget allowances are a critical component in the development of a Strategic Plan. In an effort to allow for greater budgetary planning the Strategic Planning process was paused for 2019-20 fiscal year. The brief hiatus also allowed the District to fully complete initiatives from the last five years of planning.

The Strategic Planning Process was resumed in January 2020, to allow departments to include funding for Strategic Initiatives in the upcoming budget. A $376 million budget was approved on June 9, 2020 for the 2020-21 fiscal year.

The 2020-21 Strategic Planning process was successful in generating 29 distinct projects. Realizing the timing and budgetary constraints for the 2020-21 fiscal year, 19 projects rose to the top of the priority list, and are presented on pages 20-28 of this document. The other 10 projects have been retained, and will be revisited in the future.

Pages 13-19 of this document show fiscal year 2018-19 strategic initiatives/projects and respective accomplishments. When a project was not completed during the fiscal year, a note indicates its carryover status.



CVWD's Strategic Goals



The District considered external issues and internal challenges before identifying and committing to the strategic goals below. These goals cover six areas of focus and are designed to move the District forward in executing its mission. However, there are some differences between the goals identified in fiscal year 2018-19 and fiscal year 2020-21. The District revised its previous goals during the 2020 strategic planning workshops to better align with its mission, current issues and the changing environment. All EUM attributes remain the same.

Exceptional Customer Service and Stakeholder Engagement

CVWD will provide exceptional customer service and collaborative stakeholder engagement.

Water Quality and Environmental Leadership

CVWD will be good stewards of the environment while providing water services that meet or surpass all regulatory requirements.

Water Supply Optimization

CVWD will optimize the use of existing water resources and programs, and invest in new water supplies as necessary to provide reliable water service.

Infrastructure Investment and Management

CVWD will cost-effectively construct, maintain, and replace infrastructure required to provide reliable water services.

Operational Optimization

CVWD will continuously improve its workforce, systems, facilities, and processes to effectively and innovatively meet the needs of our service area.

Financial Viability

CVWD will manage its financial resources to maintain reasonable rates while reliably meeting the service delivery needs of our customers.



Accomplishments

GOAL 1: EMPLOYEE WORKFORCE DEVELOPMENT

Objective 2: Succession planning and knowledge management

Initiative 1: Develop and implement Comprehensive Supervisor Safety Management Training Program

Status: Complete

Initiative 2: Develop knowledge transfer program for Succession Planning

Status: New Human Resources Director will incorporate data and information from consultant and build a new Human Resources Development Program, which will incorporate succession planning and knowledge management. This initiative is recommended to be carried over for the fiscal year 2020-21.



Accomplishments

GOAL 2: FINANCIAL VIABILITY

Objective 2: Maintain organizational fiscal health

Initiative 3: Reduce CalPERS unfunded liability.

Status: Complete.

Initiative 4: Establish grant funding management plan.

Status: Complete.



Accomplishments

GOAL 3: WATER SUPPLY SUSTAINABILITY

Objective 2: Eliminate Coachella Valley aquifer overdraft

Initiative 5: Eliminate Coachella Valley aquifer overdraft by implementing strategies in the 2015 Coachella Valley Water District Imported Water Use Strategy Report.

Status: Complete.

Objective 3: Update and comply with Water Management Plan

Initiative 6: Install wells to expand groundwater monitoring at Thomas E. Levy Groundwater Replenishment Facility.

Status: Complete.



Accomplishments

GOAL 3: WATER SUPPLY SUSTAINABILITY

Objective 4: Protect water supply and optimize usage

Initiative 7: Feasibility study of developing cost effective projects for storage of Colorado River water.

Status: Complete. Final study received. Recommendations to be provided..

Initiative 8: Implement Oasis In-Lieu Recharge Project, Phase 1.

Status: Complete.



4 STRATEGIC GOALS OBJECTIVES & INITIATIVES 2018-19

Accomplishments

GOAL 4: EXCEPTIONAL CUSTOMER SERVICE

Objective 1: Optimize customer experience

Initiative 9: Implement Advanced Metering Infrastructure pilot project.

Status: Complete.

Initiative 10: Develop plan to address needs and replacement of canal water ordering and billing process.

Status: A needs assessment is recomemded to examine the canal water ordering system as part of the customer billing system.



5 STRATEGIC GOALS OBJECTIVES, INITIATIVES 2018-19

Accomplishments

GOAL 5: WATER QUALITY & ENVIRONMENTAL LEADERSHIP

Objective 1: Comply with water quality regulations

Initiative 11: Evaluate and recommend information management systems for effective wastewater operator monitoring and decision making.

Status: Training will carry over into 2020.

Initiative 12 Execute a work plan to prepare the WRP 10 Groundwater Evaluation Technical Report.

Status: Complete.

Objective 2: Perform effective Environmental Resource Management

Initiative 13: Complete feasibility study for Water Treatment Plant Waste Brine Disposal Improvement Project.

Status: Complete.

Objective 3: Optimize Energy Use

Initiative 14: Complete energy audits for WRP Nos. 4 & 7, and develop plans to implement audit recommendations.

Status: Complete.



6 STRATEGIC GOALS OBJECTIVES, INITIATIVES

2018-19

Accomplishments

GOAL 6: INFRASTRUCTURE INVESTMENT & MANAGEMENT

Objective 3: Protect other physical assets

Initiative 15: Complete improvements within Coachella Valley Stormwater Channel from Avenue 54 to Thermal Drop.

Status: Internal process completed, awaiting external approvals and coordination.

Initiative 16 Implement findings of a well maintenance prioritization plan.

Status: Complete.

Initiative 17: Develop asbestos cement pipe (ACP) replacement strategy.

Status: Complete.

Initiative 18: Design Avenue 66 transmission main to provide redundancy and reliability to Eastern Coachella Valley.

Status: Complete.



1 STRATEGIC GOALS OBJECTIVES & INITIATIVES 2020-21

GOAL 1: EXCEPTIONAL CUSTOMER SERVICE & STAKEHOLDER ENGAGEMENT

Expectations

Initiative 1: Disadvantaged communities-focused outreach.

Expectation: Educate stakeholders, opinion leaders, media, policy makers about DAC needs.

Estimated Cost: None.

EUMs: Customer Satisfaction, Stakeholder Understanding and Community Sustainability.



GOAL 2: WATER QUALITY & ENVIRONMENTAL LEADERSHIP

Expectations

Initiative 2: Develop climate action plan.

Expectation: Ensure better resource stewardship. A climate action plan is required also required for low-cost financing such as State and Federal grants and loans.

Estimated Cost: $100,000

EUMs: Financial Viability and Community Sustainability.

Initiative 3: Develop co-funded research to evaluate Per- and polyfluoroalkyl substances (PFAS) attenuation through Recycled Water Irrigation. Obtain funding approval and assist Water Research Foundation (WRF) to complete consultant contracting process.

Expectation: Provide better understanding for management strategies associated with PFAS control.

Estimated Cost: $25,000

EUMs: Product Quality, Operational Optimization and Water Resource Sustainability.

Initiative 4: Initiate energy optimization programs at Water Reclamation Plants.

Expectation: Develop energy optimization equipment and processes for reducing energy use at wastewater reclamation plants.

Estimated Cost: $300,000

EUMs: Operational Optimization and Financial Viability.

GOAL 3: WATER SUPPLY OPTIMIZATION

Expectations

Initiative 5: Improve agricultural open drain monitoring network infrastructure.

Expectation: Improve drainage flow measurements to aid as modeling inputs.

Estimated Cost: $100,000

EUMs: Operational Optimization and Infrastructure Strategy & Performance.

Initiative 6: Evaluate and design mid-canal storage.

Expectation: Provide operational flexibility for the delivery of Colorado River Water through the Coachella Canal, and allows for a more efficient utilization of canal water.

Estimated Cost: $100,000

EUMs: Operational Optimization, Infrastructure Strategy & Performance and Water Resource Sustainability.

Initiative 7: Conduct long-term feasibility study for Whitewater Groundwater Replenishment Master Plan.

Expectation: Examine long-term conveyance improvements from Colorado River Aqueduct to the Whitewater Groundwater Replenishment Facility (including buried pipelines, improvements to hydroelectric generation facility).

Estimated Cost: None.

EUMs: Operational Optimization and Water Resource Sustainability.

GOAL 3: WATER SUPPLY OPTIMIZATION

Expectations

Initiative 8: Conduct pre-construction activities for Phase II of the Oasis In-Lieu Recharge Project.

Expectation: Improve groundwater levels by advancing the Oasis Project to replenish up to 32,000 acre-feet of Colorado River Water.

Estimated Cost: $500,000

EUMs: Water Resource Sustainability and Infrastructure Strategy & Performance.

Initiative 9: Expand nonpotable water (NPW) Program.

Expectation: Improve nonpotable water use by increasing storage and pump capacity at Wastewater Reclamation Plant 7.

Estimated Cost: $400,000

EUMs: Operational Optimization and Water Resource Sustainability.



GOAL 4: INFRASTRUCTURE INVESTMENT & MANAGEMENT

Expectations

Initiative 10: Conduct portable telemetry upgrade study.

Expectation: Improve reliability for telecommunications.

Estimated Cost: $100,000

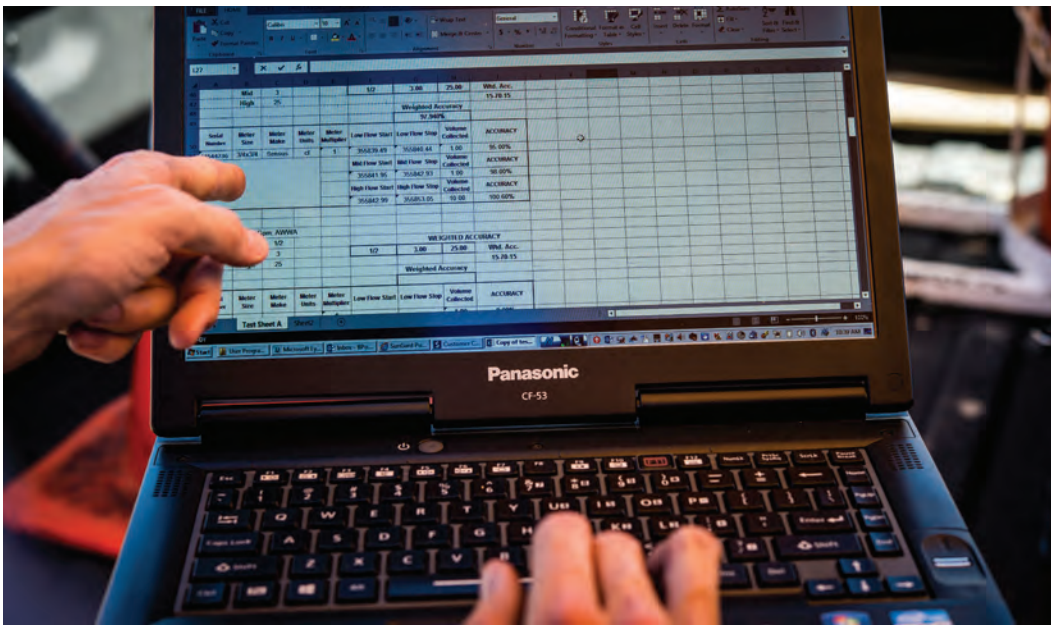
EUMs: Operational Optimization and Infrastructure Strategy & Performance.

Initiative 11: Install emergency generators at domestic water well sites.

Expectation: Improve operational reliability for domestic water system.

Estimated Cost: $450,000

EUMs: Operational Optimization and Infrastructure Strategy & Performance.



GOAL 4: INFRASTRUCTURE INVESTMENT & MANAGEMENT

Expectations

Initiative 12: Implement Phase I of surge tank protection project and eliminate program at domestic water booster station sites.

Expectation: Improve operational reliability of domestic water well sites.

Estimated Cost: $300,000

EUMs: Operational Optimization and Infrastructure Strategy & Performance.

Initiative 13: Implement Risk and Resilience Assessment Recommendations, Phase 1.

Expectation: Update the emergency response plan to address identified risks to critical domestic water infrastructure through the design process for projects.

Estimated Cost: None.

EUMs: Operational Optimization and Infrastructure Strategy & Performance and Enterprise Resiliency.



5 STRATEGIC GOALS OBJECTIVES & INITIATIVES

2020-21

GOAL 5: OPERATIONAL OPTIMIZATION

Expectations

Initiative 14: Optimize Staff Productivity.

Expectation: Implement study to evaluate operational efficiency.

Estimated Cost: None.

EUMs: Employee & Leadership Development and Enterprise Resiliency.

Initiative 15: Implement Computerized Maintenance Management System.

Expectation: Develop full-scale training program for maintenance management with integration plan.

Estimated Cost: $427,000

EUMs: Operational Optimization and Infrastructure Strategy & Performance.



5 continued

STRATEGIC GOALS OBJECTIVES & INITIATIVES

2020-21

GOAL 5: OPERATIONAL OPTIMIZATION

Expectations

Initiative 16: Participate in Partnership for Safe Water Distribution System.

Expectation: Optimize distribution system operations, pressure management, chlorine residual, main breaks for better operational controls.

Estimated Cost: $1,800

EUMs: Operational Optimization, Infrastructure Strategy & Performance and Enterprise Resiliency.

Initiative 17: Establish Human Resources Development Program (HRDP).

Expectation: Consolidate essential HR policies/procedures to improve data sharing and to create a platform for a consistent employee training program.

Estimated Cost: $125,000

EUMs: Employee & Leadership Development, Operational Optimization and Performance & Enterprise Resiliency.

Initiative 18: Administer Comprehensive Class and Compensation Study.

Expectation: Simplify job classifications, revise job descriptions, ensure wage scales are up to date with industry standards.

Estimated Cost: $90,000

EUMs: Employee & Leadership Development and Enterprise Resiliency.

6 STRATEGIC GOALS OBJECTIVES & INITIATIVES

2020-21

GOAL 6: FINANCIAL VIABILITY

Expectations

Initiative 19: Develop Request for Proposals for Enterprise Resource Planning and Utility Billing.

Expectation: Prepare work/needs assessment for potential replacement of ERP.

Estimated Cost: None

EUMs: Financial Viability and Enterprise Resiliency.



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CVWD EMPLOYEE CREED



I am the Coachella Valley Water District. I will conduct myself with the highest degree of Integrity, Humility, Respect, Competence, Commitment, Honor and Professionalism.

I will at all times conscientiously carry out my duties; and foster diligence in those I work with. I will strive to be proficient, supportive and committed to the welfare of our customers and my co-workers. I will uphold the policies of the District, and honor its mission. I understand that respect and open communication are essential in all of my daily duties.

This is my Creed. I am CVWD!

WATER DISTRICT

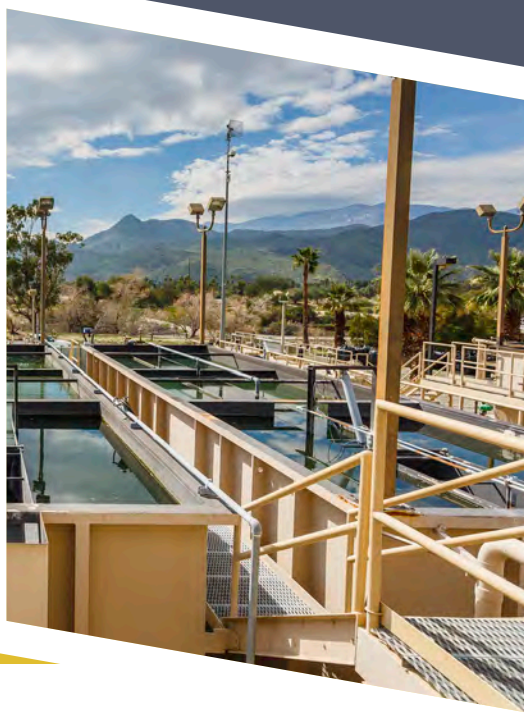
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2022 INDIO SUBBASIN WATER MANAGEMENT PLAN UPDATE

Sustainable Groundwater Management Act Alternative Plan







Volume 1: Alternative Plan

Adopted | December 2021

http://www.indiosubbasinsgma.org/

Prepared for: Indio Subbasin Groundwater Sustainability Agencies

WATER DISTRICT

COACHELLA WATER AUTHORITY & SANITARY DISTRICT
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DESERT WATER

Indio Water Authority
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7.5 Plan Scenarios

Scenarios for the *Alternative Plan Update* were developed, including baseline scenarios and future scenarios addressing potential future water supply conditions, changes in land use, and implementation of water management projects including source substitution and new water supply projects. Except for the Baseline scenario, climate change conditions were assumed for all Plan scenarios, described in Section 7.5.1 below, reflecting that the Indio GSAs are committed to achieving sustainability under changing climate conditions. Additional discussion of climate change is presented in Section 8.5 and scenarios without climate change are described in Appendix 7-B.

Each scenario was simulated over a 50-year period consistent with SGMA requirements. However, the planning assumptions were only projected for the first 25 years to the 2045 planning horizon. Thereafter, growth and supply assumptions were assumed to continue at the same rate for the second 25 years of the simulation. While extending beyond foreseeable land use and water resource planning projections, the second 25-year projections allow long-term evaluation of water supply and demand conditions, effectively testing Indio Subbasin sustainability under long-term hydrologic variability over 50 years.

The following scenarios are described in this chapter:

1. **Baseline (No New Projects):** No new supply or management projects or changes to historical hydrology. This scenario is described for comparison purposes only and will never happen, because new projects are in the process of being implemented. However, a baseline is useful to assess the other scenarios.

2. **Baseline with Climate Change**: Baseline conditions, along with assumptions of the impact of climate change on local hydrology and imported water supplies (climate change hydrology). As with the Baseline, this scenario is described for comparison purposes only and will never happen but is useful to assess the other scenarios.

3. **5-Year Plan with Climate Change**: Baseline conditions plus supply and management projects included in the GSA agencies' 5-year capital improvement plans (CIPs), along with potential climate change hydrology.

4. **Future Projects with Climate Change:** 5-Year Plan conditions plus implementation of additional supply and management projects that are projected to be completed in the 25-year planning horizon, along with potential climate change hydrology.

5. **Expanded Agriculture with Climate Change:** Future Projects conditions plus expansion of agriculture resulting in increased water demands, along with potential climate change hydrology.

Additional scenarios developed through the *Alternative Plan Update* process (including 5-Year Plan, Future Projects, and Expanded Agriculture scenarios under historical hydrology) are described in Appendix 7-B.

7.5.1 Climate Change

To simulate the range of possible future conditions, two different hydrological cycles were used and applied to the Plan scenarios. For the Baseline scenario, the observed hydrology for the Whitewater River watershed from 1970 to 2019 was repeated. In other words, the next 50 years are simulated exactly like the past 50 years. To simulate climate change conditions, a different cycle was selected: the last 25 years

was repeated twice – first in reverse and then forward. The result of the climate change cycle is that the most recent observed drought (2013 to 2017) is included twice early in the simulation. In addition, the long-term average is significantly different for the last 50 years (43,319 AFY) compared with the last 25 years (29,204 AFY). Future climate change is simulated similar to the observed conditions over the last 25 years, a period marked with reoccurring drought and below average rainfall.

The availability of imported water is also expected to be impacted by climate change. As discussed in Chapter 6, *Water Supply*, SWP reliability is assumed to be 45 percent annually, which is 13 percent lower than DWR's *2019 SWP Delivery Capability Report* estimate of 58 percent, but which captures the more recent drier hydrology and Delta export limitations within the SWP system. Under climate change, SWP deliveries are further reduced by an additional 1.5 percent as compared to Baseline conditions by 2045. For CVWD's Colorado River entitlement, the climate change scenarios assume the CVWD will contribute from 14,500 to 24,500 AFY of California's contribution under the *Lower Basin Drought Contingency Plan*. Both are conservative assumptions and result in reduced imported water delivered to the Subbasin. In some scenarios with climate change, the decreased volume of imported water results in decreased groundwater replenishment.

This representation of climate change simulates drier future conditions than the climate change recommendations from DWR. Changes to Indio Subbasin streamflow were calculated using change factors for 2030 and 2070 provided by DWR for unimpaired flow within the Salton Sea watershed (HUC 18100200). Change factors are values multiplied by historical monthly or annual streamflow values to calculate probable discharge rates and variability under climate change. In brief, climate change impacts were assessed using DWR data and methodologies and were found to be small, within 10 percent of the 1995 historical value (DWR 2018). Over the 1970 to 2019 hydrological cycle, observed watershed runoff was estimated to be 52,506 AFY, under the DWR recommended climate change projection would be 50,540 AFY, whereas repeating the 1995 to 2019 cycle (our climate change projection) results in the total watershed runoff of 38,196 AFY.

Planning for climate change is important to maintain groundwater sustainability. Future scenarios with projects are presented here with the climate change hydrology to ensure the GSAs can manage the groundwater under changing future conditions. While the Baseline scenario without climate change is discussed in Section 7.6 to illustrate the effects of climate change, all other future scenarios without climate change are presented in Appendices 7-B and 7-C.

7.5.2 Baseline (No New Projects)

The Baseline scenario includes only those supplies and facilities currently in place to support Indio Subbasin management and assumes that no new projects or water supplies will be implemented. The Baseline propagates current conditions into the future to use as a basis for comparing 'with and without' future project conditions. Figure 7-22 provides a flow chart that shows the water balance (inflows and outflows) of the Subbasin under Baseline in year 2045, as well as the supplies used to meet demands. The demand forecast for the Plan Area totals 644,610 AFY in year 2045 (see Chapter 5, *Demand Projections*). Table 7-2 provides a summary of Baseline supplies used to directly meet demand and Table 7-3 provides a summary of supplies used for replenishment. Other model inflows and outflows (septic system flows, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, and watershed runoff) including groundwater pumping are discussed in Section 7.6. A summary of the assumptions for each supply source is provided below.

The Baseline scenario assumes that passive conservation savings, surface water diversions, and GRF operations will continue to be implemented, along with potable water and sewer consolidations.

Table 7-2. Baseline (No New Projects) Scenario - Modeled Deliveries for Direct Use (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Groundwater[a]	296,089	308,643	321,483	334,169	344,092	353,244
Colorado River[b]	285,337	284,818	282,419	280,771	279,370	277,969
Recycled Water	13,397	13,397	13,397	13,397	13,397	13,397
Total Direct Use Supplies	**594,823**	**606,858**	**617,299**	**628,337**	**636,859**	**644,610**

[a] Simulated groundwater pumping in the model scenarios is within 0.03 percent; the slight difference is due to the differences in model area vs. Subbasin extent and numerical precision.

[b] Colorado River deliveries decrease over time due to conversion of agriculture that receives Canal deliveries to urban uses.

Table 7-3. Baseline (No New Projects) Scenario – Modeled Deliveries for Replenishment (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Colorado River[a]	97,000	97,000	82,000	82,000	82,000	82,000
SWP Exchange[b]	60,527	60,297	60,092	59,903	79,724	79,431
Other: Rosedale Rio-Bravo	10,563	10,563	10,563	10,563	0	0
Surface Water Diversions[c]	2,630	6,000	6,000	6,000	6,000	6,000
Total Replenishment	**170,720**	**173,860**	**158,655**	**158,466**	**167,724**	**167,431**

Note: Groundwater inflows and outflows (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, watershed runoff) are described in Section 7.6.

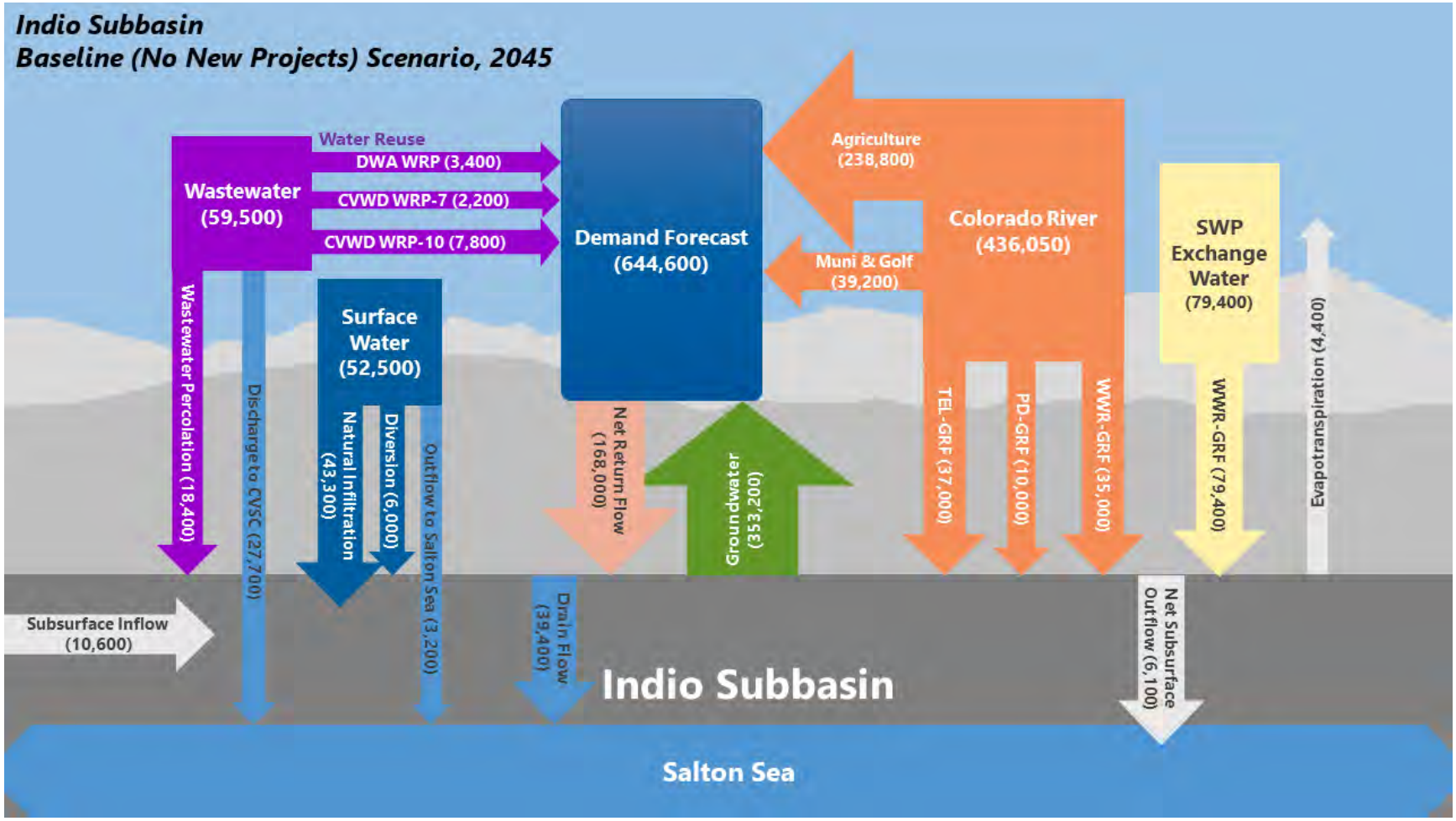
[a] Colorado River volumes assume that 15,000 AFY MWD-SWP transfer ends in 2027.

[b] SWP Exchange volumes assume Advanced Delivery credit from 2002 to 2035. This assumption is used so as not to double count advanced deliveries in future SWP deliveries.

[c] Surface water diversions include a small fraction of direct deliveries; for simplicity, all diversion volumes are assumed herein to be directed to WWR-GRF for recovery.

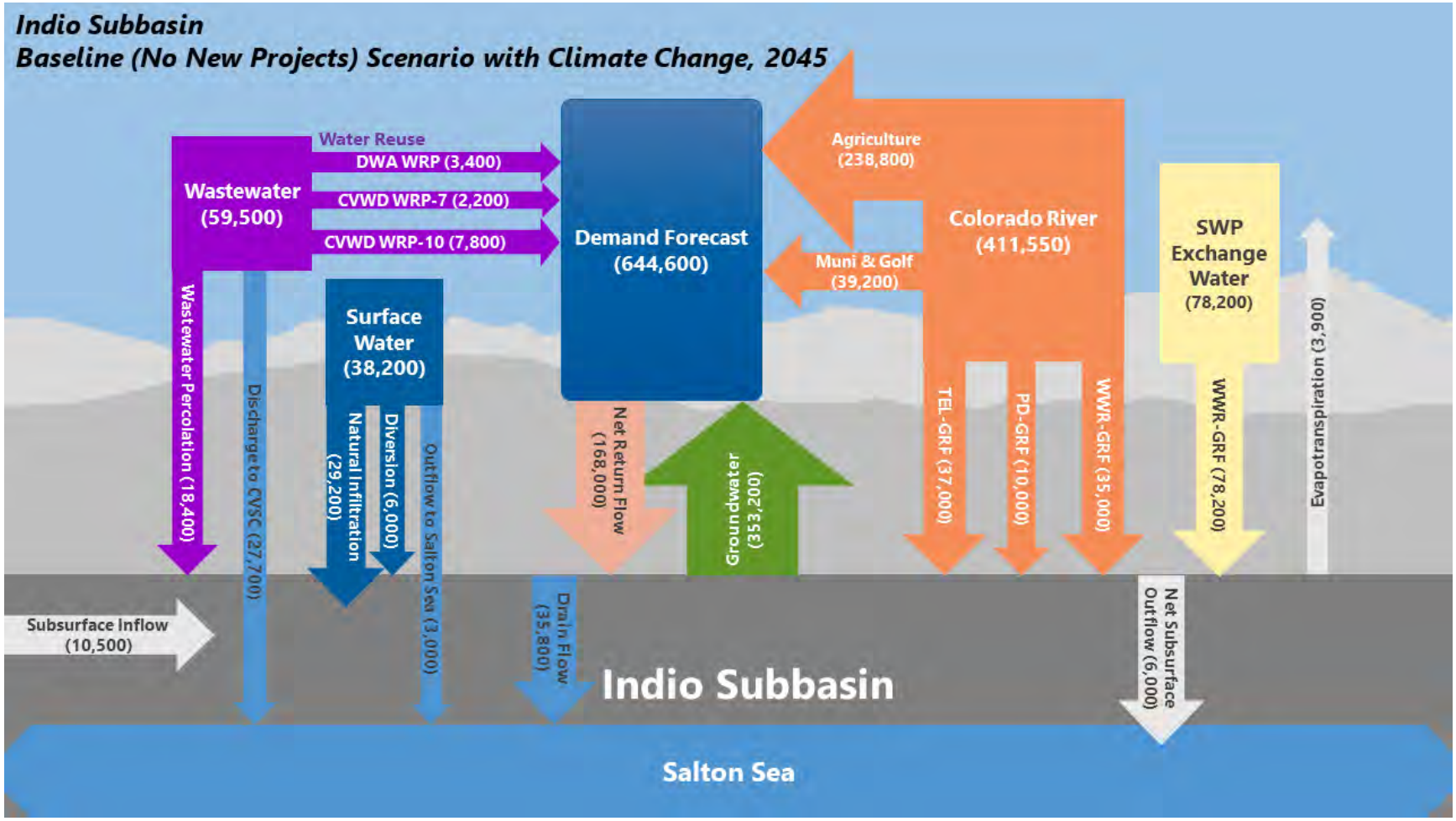
Local Inflows, Outflows, and Supplies: As illustrated in Figure 7-22, inflows to groundwater include subsurface inflow, mountain front recharge, surface water runoff that is diverted for replenishment or percolates along the mountain front or in local channels (minus losses to the Salton Sea), wastewater percolation, and return flows from use (which include septic system percolation). Total surface water runoff from local watersheds is estimated based on the 50-year hydrologic period from 1970 to 2019 and simulated into the future. Runoff inflows are assumed to vary annually, with estimated natural infiltration of watershed runoff (minus diversions and outflows to the Salton Sea) amounting to an annual average of 43,300 AF for the 50-year hydrologic period. Septic system inflow is 8,800 AFY in 2020 and decreases to 4,600 AFY by 2045 due to the connection of septic systems to sewers. Wastewater percolation serves as an inflow to the Subbasin and occurs at five wastewater treatment facility sites (Palm Springs WWTP, CVWD WRP-2, CVWD WRP-7, CVWD WRP-10, and MSWD Regional WRF). Wastewater percolation is assumed to provide an average Subbasin inflow of 6,316 AFY in 2020 and to ramp up to 18,377 AFY by 2045. Return flows from municipal, agricultural, and golf course demands are based on estimates of outdoor water use, as described in Section 7.2.5.5.

Figure 7-22. Baseline (No New Projects) Supply and Demand Flow Chart, 2045



Note: Values in this graphic are rounded to the nearest hundred and may not sum to totals. Colorado River volumes do not sum to total due to underrun under Baseline scenario with no new projects assumption.

Figure 7-23. Baseline (No New Projects) with Climate Change Supply and Demand Flow Chart, 2045



Note: Values in this graphic are rounded to the nearest hundred and may not sum to totals. Colorado River volumes do not sum to total due to underrun under Baseline with Climate Change scenario with no new projects assumption.

Local Inflows, Outflows, and Supplies: As illustrated in Figure 7-23, inflows to groundwater include subsurface inflow, surface water runoff (diverted for replenishment or percolating along local channels minus losses to the Salton Sea), wastewater percolation, and return flows from use (which include septic system percolation). However, total watershed runoff is estimated based on the drier 25-year hydrologic period from 1995 to 2019. As shown in Figure 7-23, estimated average natural infiltration of watershed runoff (minus diversions and outflows to the Salton Sea) amounts to 29,204 AFY, approximately 14,000 AFY less than in the Baseline scenario due to the drier climate change assumptions.

In the Baseline with Climate Change scenario, return flows, wastewater percolation, and septic system inflow are the same as in Baseline because the demands, which contribute to these flows, are assumed to remain unchanged. Subsurface inflow, drain flow, evapotranspiration, and subsurface outflow are derived from the MODFLOW model described in Section 7.2.5 above. As with Baseline, available local water inflows also include surface water diverted for replenishment. As with Baseline, local surface water diversions increase from 2,630 AFY in 2020 to 6,000 AFY by 2023, all of which is diverted to WWR-GRF subsurface storage and then recovered for delivery.

Colorado River: Colorado River water supplies available under Baseline with Climate Change use the same planning assumptions as Baseline, except with an assumed reduction in Canal deliveries based on the *Lower Basin Drought Contingency Plan* (*Lower Basin DCP*). According to the *Lower Basin DCP*, CVWD is responsible for a portion of California's contribution to demand reduction on the Colorado River (see Chapter 6, *Water Supply*). Under Baseline with Climate Change, Canal deliveries are assumed to be reduced by 14,500 AFY from 2020 to 2026, and by 24,500 AFY after 2026. Colorado River water demand for direct deliveries and recharge capacities are expected to remain the same as in Baseline. Under the Baseline with Climate Change scenario, a portion of available Colorado River supply is not able to be beneficially used.

SWP Exchange: SWP Exchange supplies available under Baseline with Climate Change are the same as under Baseline in terms of 45 percent average annual reliability, variability factors applied based on water years, and Advance Delivery credits applied for 2020 to 2035. Under anticipated climate conditions, reliability is assumed to be reduced by an additional -1.5 percent as compared to Baseline by 2045, as modeled by DWR in its *2019 SWP Delivery Capability Report* (DWR, 2020).

SWP Exchange water is assumed to be used for replenishment at the WWR-GRF and MC-GRF, and the allocation of water between these replenishment facilities is consistent with the 2004 Settlement Agreement.

Recycled Water: Recycled water supplies under the Baseline with Climate Change are identical to the Baseline planning assumptions, remaining at 13,397 AFY.

Other Supplies: Rosedale-Rio Bravo deliveries of 10,583 AFY from 2020 to 2035 assume no loss due to climate change.

7.5.4 5-Year Plan with Climate Change

The 5-Year Plan with Climate Change scenario includes supplies and facilities currently in place to support Subbasin management, along with new projects planned to be completed as part of the GSAs' 2020 5-year capital improvement programs (5-year CIPs) and supplies under the control of GSAs. This scenario assumes that climate change will impact imported water and local water supplies. Table 7-6 provides a summary of 5-Year Plan with Climate Change supplies used to directly meet demand and Table 7-7 provides a summary of supplies used for replenishment. Supply inputs used for the model (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, and watershed runoff) and groundwater pumping are discussed in Section 7.6. Figure 7-24 provides a flow chart that shows the water balance of the basin under 5-Year Plan with Climate Change in year 2045, as well as the supplies used to meet demands. The demand forecast for the Plan Area totals 644,610 AFY in year 2045 (see Chapter 5, *Demand Projections*). A summary of the assumptions applied to each supply source is provided below.

The 5-Year Plan with Climate Change scenario assumes that passive conservation savings, surface water diversions, and GRF operations will continue to be implemented, along with potable water and sewer consolidations. New supply from Lake Perris Seepage project becomes available in 2023. Planned non-potable expansions from WRP-7 and WRP-10 will deliver Canal and recycled water, along with Canal deliveries to East Valley golf courses and the Oasis Distribution System. Additionally, PD-GRF expansion will allow for greater Subbasin replenishment.

Table 7-6. 5-Year Plan with Climate Change Supply Scenario – Modeled Deliveries for Direct Use (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Groundwater[a]	296,089	271,914	284,754	297,440	307,362	316,514
Colorado River[b]	285,337	317,932	314,733	312,385	310,184	307,883
Recycled Water	13,397	17,013	17,813	18,513	19,313	20,213
Total Direct Use Supplies	**594,823**	**606,858**	**617,299**	**628,337**	**636,859**	**644,610**

[a] Simulated groundwater pumping in the model scenarios is within 0.03 percent; the slight difference is due to the differences in model area vs. Subbasin extent and numerical precision.

[b] Colorado River deliveries increase over time due to new non-potable connections.

Table 7-7. 5-Year Plan with Climate Change Scenario – Modeled Deliveries for Replenishment (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Colorado River[a]	97,000	93,868	96,817	97,000	97,000	97,000
SWP Exchange[b]	60,527	62,576	62,125	61,690	81,268	80,733
Other: Rosedale Rio-Bravo	10,563	10,563	10,563	10,563	0	0
Surface Water Diversions[c]	2,630	6,000	6,000	6,000	6,000	6,000
Total Replenishment	**170,720**	**173,007**	**175,505**	**175,253**	**184,268**	**183,733**

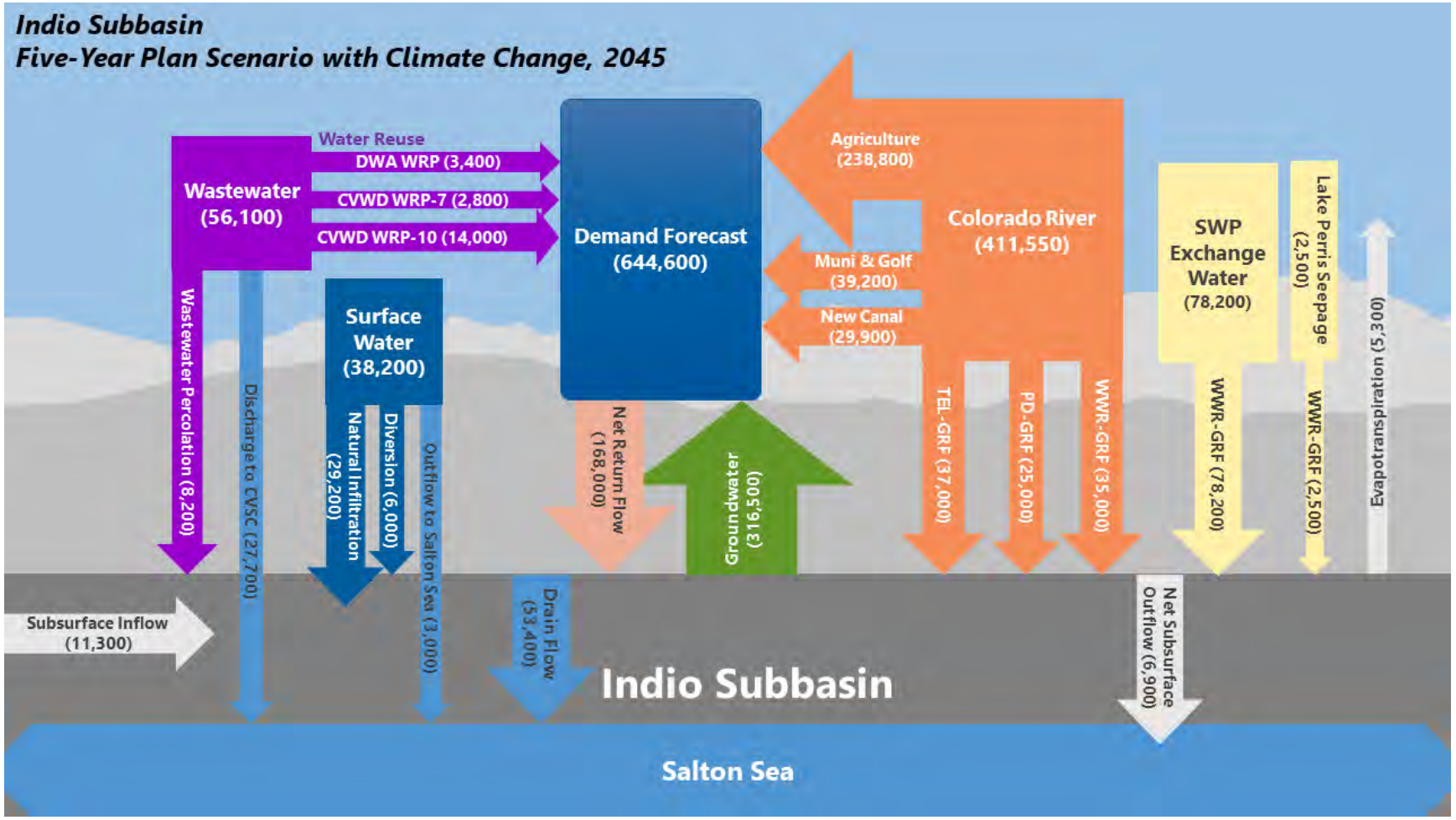
Note: Groundwater inflows and outflows (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, watershed runoff) are described in Section 7.6.

[a] Colorado River volumes assume that 15,000 AFY MWD-SWP transfer ends in 2027.

[b] SWP Exchange volumes assume Advanced Delivery credit from 2002 to 2035. This assumption is used so as not to double count advanced deliveries in future SWP deliveries.

[c] Surface water diversion include a small fraction of direct deliveries; for simplicity, all diversion volumes are assumed herein to be directed to WWR-GRF for recovery.

Figure 7-24. 5-Year Plan with Climate Change Supply and Demand Flow Chart, 2045



Note: Values in this graphic are rounded to the nearest hundred and may not sum to totals. Colorado River volumes do not sum to total due to underrun under Baseline with Climate Change scenario with no new projects assumption.

Local Inflows, Outflows, and Supplies: Surface water hydrology under 5-Year Plan with Climate Change is the same as Baseline with Climate Change, as are return flows and septic system inflows. Wastewater percolation is expected to be reduced due to an increase in recycled water use (described below). In this scenario, wastewater from the MSWD Regional WRF is transferred north for use in the Mission Creek Subbasin starting in 2027. Subsurface inflow, drain flow, evapotranspiration, and subsurface outflow are derived from the MODFLOW model described in Section 7.2.5.

Colorado River: Colorado River water supplies available under the 5-Year Plan with Climate Change are assumed to remain the same as under Baseline with Climate Change (assuming reductions due to *Lower Basin DCP*); however, available supply use increases due to planned expansions to replenishment facilities and direct deliveries. Under 5-Year Plan with Climate Change, the PD-GRF is planned to expand to allow for recharge to increase from 10,000 AFY in 2020 to 25,000 AFY in 2023. By expanding recharge at the PD-GRF and reducing the supply available under climate change conditions, the Colorado River supplies used for recharge at the WWR-GRF are reduced from 2023 to 2045 as the supply is utilized for recharge at PD-GRF, additional non-potable connections in the East Valley and mid-Valley, and by the Oasis In-lieu Project. Increases in Colorado River direct deliveries begin in 2022 at 1,122 AFY and total 36,729 AFY by 2025. As available Colorado River supply is fully utilized in the Mid- and East Valley areas, CVWD will reduce replenishment at the GRFs. The increase in direct deliveries results in a reduction in replenishment of CVWD's 2003 QSA entitlement at WWR-GRF to 22,645 AFY beginning in 2027.

SWP Exchange: SWP Exchange supplies available under 5-Year Plan with Climate Change are the same as under Baseline with Climate Change, with 45 percent reliability varied annually and -1.5 percent reduction due to climate change. SWP Exchange water is assumed to be used for replenishment at the WWR-GRF and MC-GRF, consistent with the *2004 Settlement Agreement*. New supplies (2,500 AFY) from the Lake Perris Seepage Recovery project come online in 2023.

Recycled Water: Recycled water availability is expected to increase due to increased recycled water production and deliveries to new non-potable connections. WRP-7 deliveries increase from 2,201 AFY in 2020 to 2,800 AFY in 2025. WRP-10 deliveries increase from 7,783 AFY in 2020 to 14,000 AFY in 2045. Any recycling of wastewater from WRP-10 and WRP-7 disposed to percolation ponds would offset groundwater pumping, but reduce net return flows to groundwater.

Other Supplies: Rosedale-Rio Bravo deliveries remain the same as in Baseline.

7.5.5 Future Projects with Climate Change

The Future Projects with Climate Change Scenario (Future Projects with Climate Change) includes supplies and facilities currently in place to support Subbasin management, along with projects for new supplies and facilities that are planned by the GSA agencies within the 25-year planning horizon. Supply constraints associated with climate changes are assumed for local and imported supplies. Table 7-8 provides a summary of Future Projects with Climate Change supplies used to directly meet demand and Table 7-9 provides supplies used for replenishment. Other inflows and outflows to the model (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, and watershed runoff) including groundwater pumping are discussed in Section 7.6. Figure 7-25 provides a flow chart that shows the water balance of the Subbasin under Future Projects with Climate Change in year 2045, as well as the supplies used to meet demands. The demand forecast for the Plan Area totals 644,610 AFY in year 2045 (see Chapter 5, *Demand Projections*). A summary of the assumptions applied to each supply source is provided below.

The Future Projects with Climate Change Scenario assumes that passive conservation savings, surface water diversions, and GRF operations will continue to be implemented, along with potable water and sewer consolidations. Participation in the DCF will restore SWP supply reliability to 59 percent, and Sites Reservoir and Lake Perris Seepage will come online in 2023 and 2035, respectively, and continue through the planning horizon. Planned non-potable expansions from WRP-7 and WRP-10 will deliver increased Canal and recycled water, along with increased Canal deliveries to Mid-Valley Pipeline connections, East Valley golf courses, and the Oasis Distribution System (as compared to the 5-Year Plan scenario). The EVRA potable reuse project will be implemented.

Table 7-8. Future Projects with Climate Change Scenario – Modeled Deliveries for Direct Use (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Groundwater[a]	296,088	271,914	266,364	261,423	267,252	276,404
Colorado River[b]	285,337	317,932	333,122	348,401	350,294	347,993
Recycled Water	13,397	17,013	17,813	18,513	19,313	20,213
Total Direct Use Supplies	**594,823**	**606,858**	**617,299**	**628,337**	**636,859**	**644,610**

[a] Simulated groundwater pumping in the model scenarios is within 0.03 percent; the slight difference is due to the differences in model area vs. Subbasin extent and numerical precision.

[b] Colorado River deliveries increase over time due to new non-potable connections.

Table 7-9. Future Projects with Climate Change Scenario – Modeled Deliveries for Replenishment (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Colorado River[a]	97,000	93,868	78,428	63,149	61,256	63,557
SWP Exchange[b]	60,527	62,576	62,125	72,193	91,732	114,720
Other: Rosedale Rio-Bravo	10,563	10,563	10,563	10,563	0	0
Indirect Potable Reuse	0	0	5,000	5,000	5,000	5,000
Surface Water Diversions[c]	2,630	6,000	6,000	6,000	6,000	6,000
Total Replenishment	**170,720**	**173,007**	**162,116**	**156,905**	**163,988**	**189,277**

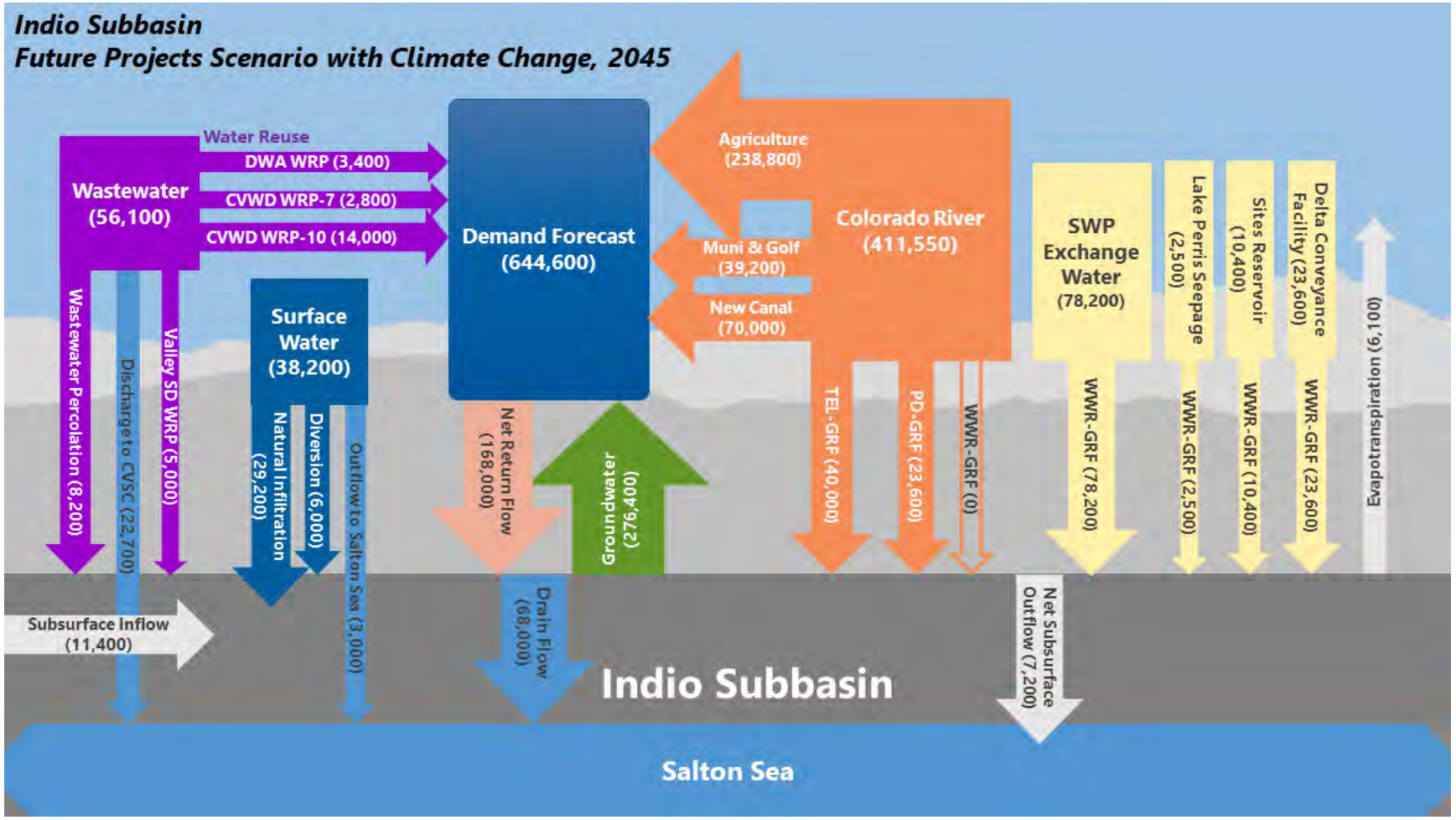
Note: Groundwater inflows and outflows (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, watershed runoff) are described in Section 7.6.

[a] Colorado River volumes assume that 15,000 AFY MWD-SWP transfer ends in 2027.

[b] SWP Exchange volumes assume Advanced Delivery credit from 2002 to 2035. This assumption is used so as not to double count advanced deliveries in future SWP deliveries. SWP Exchange includes future supplies from DCF, Sites Reservoir, and Lake Perris Seepage as described below.

[c] Surface water diversions include a small fraction of direct deliveries; for simplicity, all diversion volumes are assumed herein to be directed to WWR-GRF for recovery.

Figure 7-25. Future Projects with Climate Change Supply and Demand Flow Chart, 2045



Note: Values in this graphic are rounded to the nearest hundred and may not sum to totals.

Local Inflows, Outflows, and Supplies: Surface water hydrology under Future Projects with Climate Change is the same as Baseline with Climate Change, as are return flows and septic system inflows. Wastewater percolation is expected to be reduced due to an increase in recycled water use (described below), along with the transfer of MSWD Regional WRF flows to the Mission Creek Subbasin starting in 2027. Subsurface inflow, drain flow, evapotranspiration, and subsurface outflow are derived from the MODFLOW model described in Section 7.2.5.

Colorado River: Colorado River water supplies available under Future Projects with Climate Change are assumed to remain the same as under the 5-Year Plan with Climate Change, but with additional direct deliveries. Under Future Projects with Climate Change, in addition to the replenishment facility expansions discussed under the 5-Year Plan, the TEL-GRF will expand from a capacity of 37,000 AFY in 2020 to 40,000 AFY in 2025. Increases in Colorado River direct deliveries begin in 2022 at 1,122 AFY and amount to 76,839 AFY by 2045. As available Colorado River supply is fully utilized in the Mid- and East Valley, CVWD will reduce replenishment at WWR-GRF and PD-GRF. The increase in direct deliveries results in a reduction in replenishment of CVWD's 2003 QSA entitlement at PD-GRF beginning in 2031 to a low of 4,535 AFY in 2045. Under this scenario, QSA water is not available for recharge at WWR-GRF starting in 2031.

SWP Exchange: SWP Exchange supplies available under Future Projects with Climate Change include the Table A deliveries (45 percent reliability varied annually based on water year and -1.5 percent reduction due to climate change) assumed under Baseline with Climate Change, with the addition of the following projects:

- Delta Conveyance Facility (DCF) to increase the reliability of SWP deliveries by 26,500 AFY (to 59% of Table A) in 2040 due to improvements in Delta conveyance, reduced by the volume diverted to MC-GRF under the *2014 Mission Creek Water Management Agreement* (see Chapter 6, *Water Supply*).
- Lake Perris Dam Seepage Recovery Project to provide 2,754 AFY, reduced by the volume diverted to MC-GRF. Lake Perris Seepage will come online in 2023 and continue through the planning/modeling horizon.
- Sites Reservoir Project to provide 11,550 AFY, reduced by the volume diverted to MC-GRF. Sites Reservoir will come online in 2035 and continue through the planning/modeling horizon. 30 percent conveyance loss is applied to this supply.

Recycled Water: Recycled water supplies under Future Projects with Climate Change are further expanded from those shown under the 5-Year Plan with Climate Change, including an increase in recycled water deliveries by 6,815 AFY in 2045 and with 5,000 AFY of potable reuse from Valley Sanitary District's WRP (referred to as the EVRA Potable Reuse Project).

Other Supplies: Rosedale-Rio Bravo deliveries remain the same as in Baseline.

7.5.6 Expanded Agriculture with Climate Change

The Expanded Agriculture with Climate Change Scenario (Expanded Agriculture with Climate Change) includes increased agricultural demands, along with the same suite of planned future projects described under the Future Projects with Climate Change Scenario. This scenario assumes 8,000 acres of additional farmland (inclusive of 1,500 AFY in baseline demand forecast). This scenario assumes that new agricultural growth occurs due in part to expanded availability of Canal water to currently idle lands. The

scenario allocates 85 percent of new agricultural demands to Canal water and 15 percent to groundwater.

Table 7-10 provides a summary of Expanded Agriculture with Climate Change supplies used to directly meet demand and Table 7-11 provides a summary of supplies used for replenishment. Other inflow and outflows to the model (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, and watershed runoff) including groundwater pumping are discussed in Section 7.6. Figure 7-26 provides a flow chart that shows the water balance of the Indio Subbasin under Expanded Agriculture with Climate Change in year 2045, as well as the supplies used to meet demands. The demand forecast for the Expanded Agriculture with Climate Change scenario includes an additional 8,000 acres of agricultural production and totals 679,696 AFY in year 2045 (assuming 15 percent of additional crop demand served by groundwater and 85 percent by Canal water). All water supplies and projects described under Future Projects with Climate Change are applied to this scenario.

The Expanded Agriculture with Climate Change scenario assumes the same projects and supplies as the Future Projects scenario. Planned non-potable expansions from WRP-7 and WRP-10 will deliver increased Canal and recycled water, along with increased Canal deliveries to Mid-Valley Pipeline connections, East Valley golf courses, and the Oasis Distribution System (as compared to the 5-Year Plan scenario). The EVRA potable reuse project will be implemented.

Table 7-10. Expanded Agriculture with Climate Change Scenario – Modeled Deliveries for Direct Use (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Groundwater[a]	296,088	272,967	268,470	264,581	271,463	281,667
Colorado River[b]	285,337	323,896	345,051	366,295	374,152	377,816
Recycled Water	13,397	17,013	17,813	18,513	19,313	20,213
Total Direct Use Supplies	**594,823**	**613,876**	**631,334**	**649,389**	**664,928**	**679,696**

[a] Simulated groundwater pumping in the model scenarios is within 0.03 percent; the slight difference is due to the differences in model area vs. Subbasin extent and numerical precision.

[b] Colorado River deliveries increase over time due to new non-potable connections.

Table 7-11. Expanded Agriculture with Climate Change Scenario – Modeled Deliveries for Replenishment (AFY)

Supply (Acre-Feet)	2020	2025	2030	2035	2040	2045
Colorado River[a]	97,000	87,904	66,499	45,255	37,398	33,734
SWP Exchange[b]	60,527	62,576	62,125	72,193	91,732	114,720
Other: Rosedale Rio-Bravo	10,563	10,563	10,563	10,563	0	0
Indirect Potable Reuse	0	0	5,000	5,000	5,000	5,000
Surface Water Diversions[c]	2,630	6,000	6,000	6,000	6,000	6,000
Total Replenishment	**170,720**	**167,043**	**150,187**	**139,011**	**140,130**	**159,454**

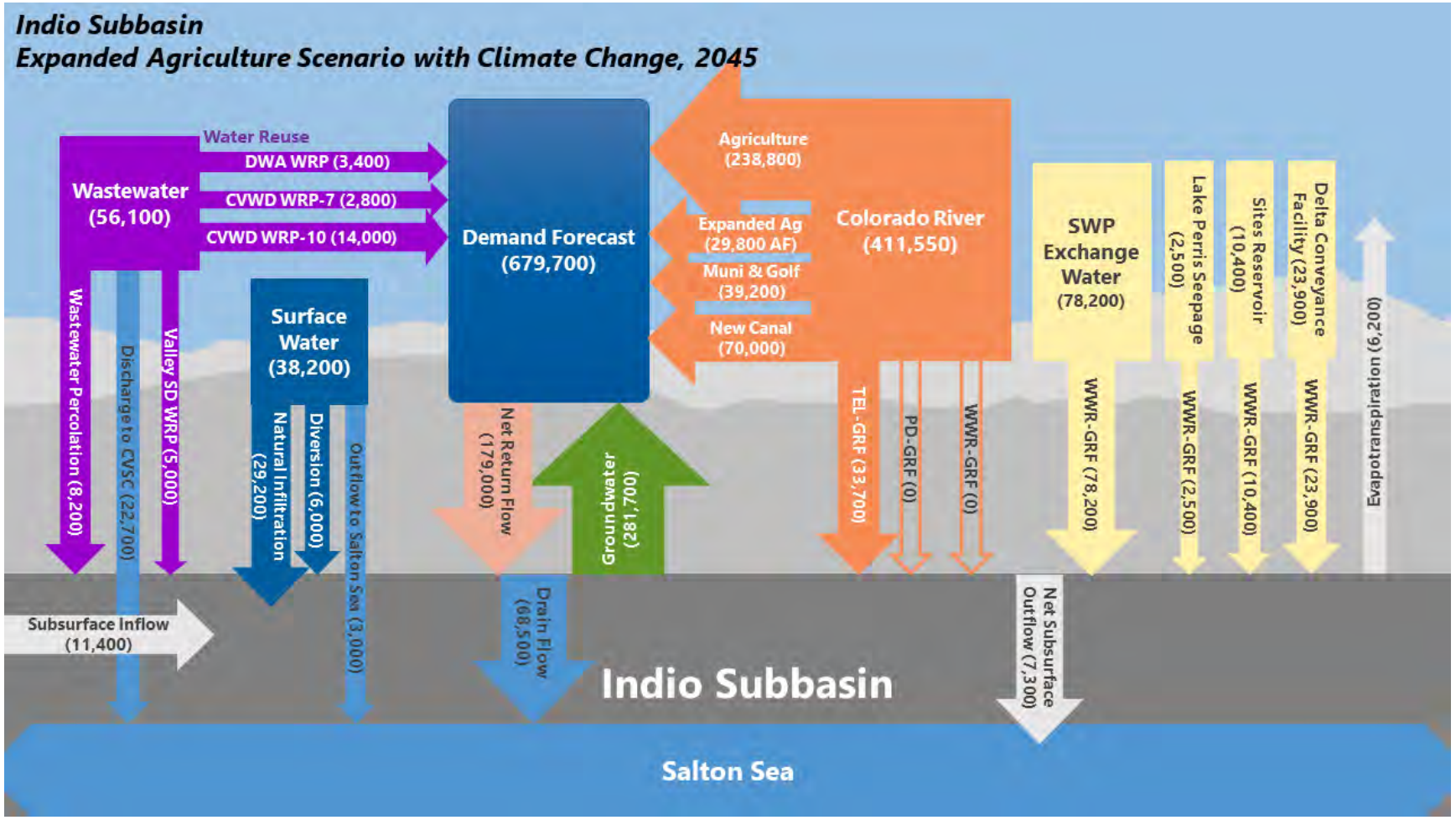
Note: Groundwater inflows and outflows (septic systems, return flows, subsurface inflow and outflow, drain flows, evapotranspiration, watershed runoff) are described in Section 7.6.

[a] Colorado River volumes assume that 15,000 AFY MWD-SWP transfer ends in 2027.

[b] SWP Exchange volumes assume Advanced Delivery credit from 2002 to 2035. This assumption is used so as not to double count advanced deliveries in future SWP deliveries. SWP Exchange includes future supplies from DCF, Sites Reservoir, and Lake Perris Seepage as described below.

[c] Surface water diversions include a small fraction of direct deliveries; for simplicity, all diversion volumes are assumed herein to be directed to WWR-GRF for recovery.

Figure 7-26. Expanded Agriculture with Climate Change Supply and Demand Flow Chart, 2045



Note: Values in this graphic are rounded to the nearest hundred and may not sum to totals.

Local Inflows, Outflows, and Supplies: Surface water hydrology under Expanded Agriculture with Future Projects and Climate Change is the same as Baseline with Climate Change, as are return flows and septic system inflows. Wastewater percolation is expected to be reduced due to an increase in recycled water use (described below), along with the transfer of MSWD Regional WRF flows to the Mission Creek Subbasin starting in 2027. Subsurface inflow, drain flow, evapotranspiration, and subsurface outflow are derived from the MODFLOW model described in Section 7.2.5.

Colorado River: Colorado River water supplies available under Expanded Agriculture with Future Projects and Climate Change are assumed to remain the same as under the Future Projects with Climate Change, but with additional expansions of direct deliveries. Increases in Colorado River direct deliveries begin in 2022 at 1,122 AFY and amount to 106,663 AFY by 2045. As available Colorado River supply is fully utilized in the Mid- and East Valley, CVWD will reduce replenishment at the GRFs. This results in a reduction in replenishment of CVWD's 2003 QSA entitlement at TEL-GRF beginning in 2031 to a low of 14,712 AFY in 2045, along with ending QSA deliveries at WWR-GRF in 2028 and PD-GRF in 2031.

SWP Exchange: SWP Exchange supplies are the same as under Future Projects with Climate Change and include Table A deliveries (45 percent reliability varied annually based on water year and -1.5 percent reduction due to climate change) along with DCF, Lake Perris Dam Seepage Recovery Project, and Sites Reservoir Project.

Recycled Water: Recycled water supplies are the same as under Future Projects with Climate Change.

Other Supplies: Rosedale-Rio Bravo deliveries remain the same as in Baseline.

7.6 Scenario Implementation

The calibrated Indio Subbasin MODFLOW model was used to simulate water budgets and groundwater level changes over a future 50-year period, from January 2020 to December 2069. The same model area, boundaries, layering, aquifer characteristics, drains, and evapotranspiration areas used in the historical model were maintained in the future predictive model. Only model inflow and outflow amounts, and selected model boundary conditions, were changed for the scenario simulations. Model inflow and outflow sources and rates were estimated for five scenarios, as described in Section 7.5. Annual model stress periods and 12 timesteps per stress period were used, as with the updated historical model. Predicted groundwater level changes over time (along with future changes in Subbasin storage, drain flows, and flows to the Salton Sea) were evaluated to assess overall groundwater Subbasin response, local changes, and effectiveness of the potential management actions for each modeled scenario. The methods used to extend the estimates of each element of the water budget and model input are described in detail below.

7.6.1 Inflows

The Indio Subbasin is recharged through a combination of natural inflows of surface water and groundwater, replenishment of imported water, wastewater percolation, and irrigation return flows. Each of these sources was updated to reflect the specific future conditions in each scenario, as described in Section 7.5 above.

Figure 7-27 shows the average water balance by element for each scenario. Figure 7-27 and Table 7-12 shows the average water balance by element for each scenario. The bar chart summarizes each scenario by the average annual contribution by water balance element over the future planning period (2020 to 2045). The following sections describe each of the sources of inflow to the Indio Subbasin.

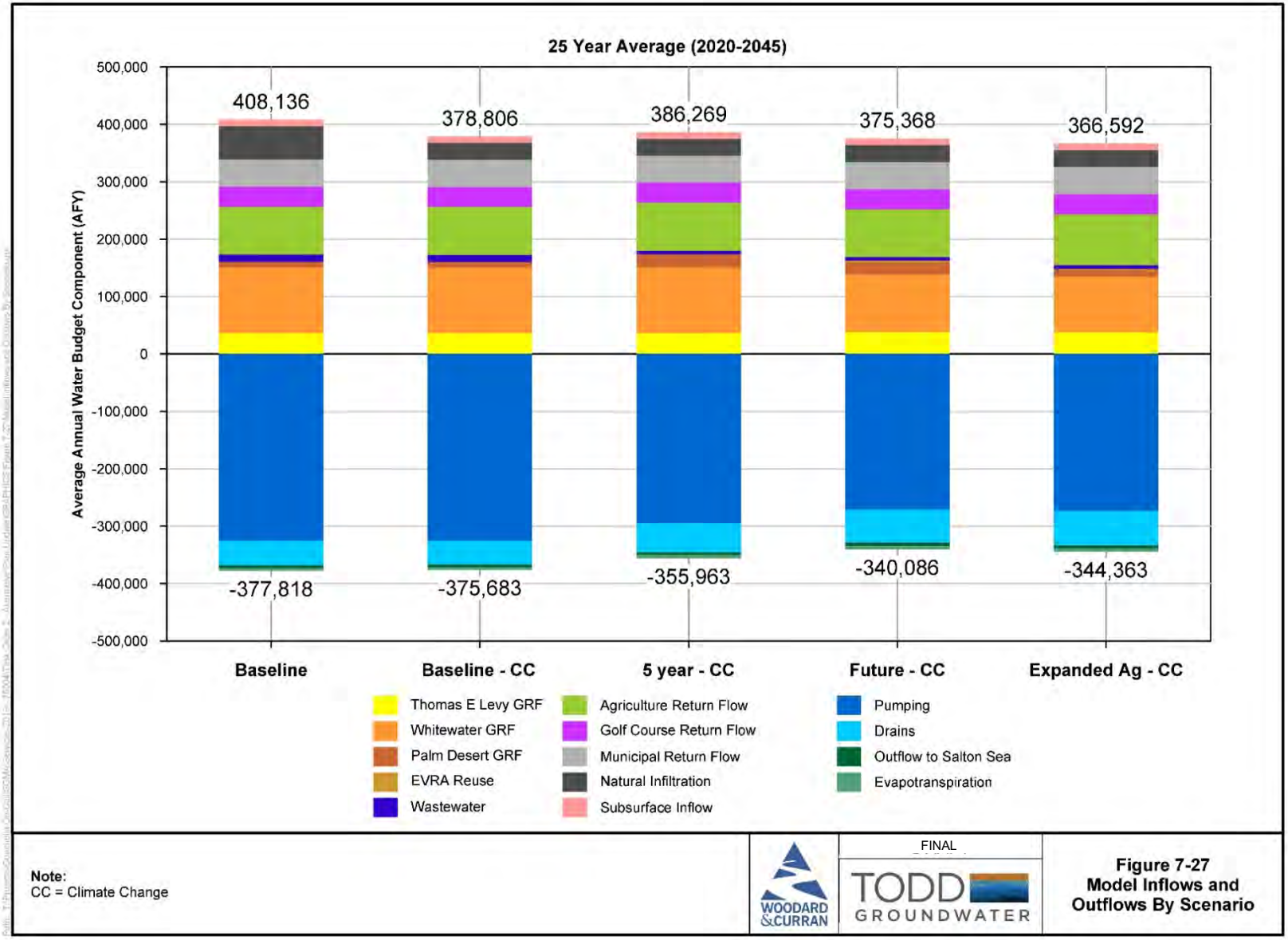
Table 7-12. Simulated Inflows and Outflows, 25-Year Average (2020-2045) (AFY)

	Baseline with Climate Change (AFY)	5-Year Plan with Climate Change (AFY)	Future Projects with Climate Change (AFY)	Expanded Agriculture with Climate Change (AFY)
Inflow				
Whitewater River-GRF[a]	114,775	114,843	100,019	97,637
Thomas E Levy-GRF	36,260	36,260	38,612	37,784
Palm Desert-GRF	9,800	22,736	21,352	10,723
Indirect Potable Reuse	-	-	2,940	2,940
Wastewater Percolation	12,077	6,244	6,244	6,244
Agricultural Return Flow	83,727	83,727	83,727	88,789
Golf Course Return Flow	34,348	34,348	34,348	34,348
Municipal Return Flow	47,626	47,626	47,626	47,626
Natural Infiltration	29,204	29,204	29,204	29,204
Subsurface Inflow	10,990	11,283	11,297	11,298
Total Inflows	**378,806**	**386,269**	**375,368**	**366,592**
Outflow				
Groundwater Pumping	(325,477)	(294,397)	(271,165)	(273,695)
Drain Flows	(40,903)	(50,980)	(57,781)	(59,416)
Evapotranspiration (from Shallow Groundwater)	(4,480)	(5,273)	(5,643)	(5,730)
Outflow to Salton Sea	(4,823)	(5,313)	(5,497)	(5,522)
Total Outflows	**(375,683)**	**(355,963)**	**(340,086)**	**(344,363)**
Average Annual Change in Storage (AFY)	**+3,122**	**+30,306**	**+35,282**	**+22,229**

Note: Totals may not sum due to rounding.

[a] Replenishment estimates for Whitewater River-GRF include imported water and surface water diversions.

Figure 7-27. Model Inflows and Outflows by Scenario



7.6.1.1 Subsurface Inflows

Subsurface inflow from the Mission Creek Subbasin was updated for the entire future period, based on values recently generated from the Mission Creek Subbasin MODFLOW model (Wood, 2021). Predicted subsurface outflows from the Mission Creek Subbasin for future scenarios (corresponding to the Indio Subbasin scenarios) were used as subsurface inflow to the Indio Subbasin. For the Expanded Agriculture with Climate Change scenarios, the Future Projects with Climate Change inflows were used. Flows were allocated to five model boundary segments along the Banning/San Andreas Fault at the eastern edges of the Garnet Hill, Indio Hills, and Thousand Palms Subareas (Figure 7-6). Average annual inflows for the future scenarios range from approximately 2,000 AFY for the Baseline with Climate Change scenario to 2,300 AFY for the Future Projects with Climate Change scenario. Subsurface inflow from the San Gorgonio Pass Subbasin was not changed from the *2010 CVWMP Update* model and was kept at the long-term average of approximately 9,000 AFY used in the calibrated historical model, shown on Figure 7-27**.** As described in Section 7.2.5, uncertainty exists in the historical and potential future amounts of inflow from the San Gorgonio Pass Subbasin. The Indio and San Gorgonio Pass Subbasin GSAs have discussed the discrepancy in simulated amounts of subsurface flow between the Subbasins, and plan to reconcile the differences as a part of the next 5-Year Plan update.

7.6.1.2 Surface Water Inflows

As discussed in Section 7.1, recharge from mountain front inflow and from percolation of stream flows into the Indio Subbasin was estimated for 24 watersheds and stream channels along the southwest edge of the model. Streamflow percolation and mountain front recharge are inflows to the model and vary widely from wet to dry years. As discussed in Section 7.5.1, two hydrological cycles were used for future scenarios, one with Climate Change and one without. Climate change would result in decreased rainfall and therefore decreased mountain front recharge and percolation of stream flows. The long-term average for surface water inflow ranges from 43,319 AFY without climate change and 29,204 AFY with climate change over the entire 50-year simulation. Natural infiltration is shown as dark grey on Figure 7-27**.**

7.6.1.3 Replenishment

The annual volumes of replenishment were compiled and applied to the locations of the GRFs based on the suite of projects included in each scenario as described in Section 7.5. These include the WWR-GRF, TEL-GRF, and the recently completed PD-GRF. The total volume at each location is a result of the available imported water for replenishment and the capacity of the facility. The available imported water in turn is controlled by the contracts, projects, agreements, and hydrological conditions. The assumptions used to develop the future replenishment amounts were described in Section 7.5. Evaporative losses were assumed to be four percent of recharged volume for the WWR-GRF and two percent for all other locations, reflecting the larger surface area and windier conditions at the WWR-GRF. Total annual recharge volumes at the replenishment facilities are shown as yellow, light orange, and dark orange on Figure 7-27**.**

7.6.1.4 Wastewater Discharges

Four wastewater plants discharge to disposal ponds (Palm Springs WWTP and CVWD WRP-2, WRP-7, and WRP-10). In addition, a new MSWD Regional WRF will soon be completed in Garnet Hill. Under the Baseline conditions, wastewater will be percolated at this location, but under 5-Year Plan and Future scenarios, wastewater percolation does not continue past 2025 and recycled water from the plant is delivered to Mission Creek Subbasin. The future percolation volumes for all plants were calculated based on expected inflow and recycled water deliveries. For future conditions, evaporative losses were assumed

at two percent of the recharged volume. The ponds have evaporative losses, calculated by the area of ponds and expected annual evaporation. The remaining volumes percolated into the Subbasin are shown as cobalt blue on Figure 7-27**.**

7.6.1.5 Applied Water Return Flows

Irrigation needs are expected to follow the increases (or decreases) in demands for each of the major categories – agricultural, golf, and municipal. The demands are documented in Chapter 5, *Demand Projections,* and expected return flows are calculated with the same methodology as the historical model. Agricultural change, both the conversion of agricultural parcels to urban in some areas and the increase in acreage in others, is detailed in Chapter 5, *Demand Projections*. Expected return flows were increased or decreased based on the percentage of expected change in agricultural acreage (either conversion to municipal uses or conversion from idle land to active agriculture) by geographic area. Future agricultural demand projections are the same in all scenarios, with the exception of the expanded agricultural scenario. The areal distribution was the same as the historical model which used the CVWD crop censuses to identify specific crop areas, only the volumes adjusted based on land use changes.

Municipal return flow is estimated using the percent of outdoor irrigation expected to result in return flow and the volume of septic system return flow by geographic area. The expected future outdoor municipal demand and septic system flow is documented in Chapter 5, *Demand Projections,* and the percent resulting in return flow is the same by geographic area as used in the historical model calculations, which relied on the most recent crop census, Section 7.2.5.5.

Return flow from golf courses was based on the calculated return flow in the historical model using the demand and supply at the locations of the existing courses (Section 7.2.5.5). Additional return flow (34 percent of expected demand of each golf course) was added for the three expected new golf courses based on the timing and location of those projects (refer to Chapter 5, *Demand Projections*).

Municipal return flows also include expected septic system return flow. For all but the Expanded Agriculture with Climate Change scenario, return flows remain the same for each scenario. Agricultural, golf, and municipal return flows are shown green, magenta, and light grey, respectively on Figure 7-27**.**

As described in Section 7.5 above, the Expanded Agriculture with Climate Change scenario includes an additional 8,000 acres of irrigated agricultural land in the East Valley. Additional agricultural demand was estimated by applying the average applied water rate in the East Valley (5.4 AFY/acre). The irrigation source was assumed to be 15 percent additional groundwater pumping and 85 percent new direct delivery connections. Return flows associated with the additional agricultural were increased relative to the expected demand increase and applied over areas with existing agriculture in the East Valley.

7.6.2 Outflows

For each scenario, the only prescribed outflow was groundwater pumping. The remaining outflows (drain flows, ET, and groundwater outflows to the Salton Sea) are dependent on the simulated water levels of the model.

7.6.2.1 Groundwater Production

For the future scenarios, pumping was assumed to continue from the same distribution of wells in the Subbasin as the historical model. Increased water demands were identified on a geographic area and the volume of pumping for that area was increased to meet the total expected volume (current plus increased demand). The increase in demand is detailed in Chapter 5, *Demand Projections*. For all but the Expanded

Agriculture with Climate Change scenario, forecasted water demands remain the same, but depending on what projects are implemented, the source of supply differs by individual scenario (e.g., groundwater pumping may shift to Canal direct deliveries). The Expanded Agriculture with Climate Change scenario includes an increase in agricultural water demand, 15 percent of which is assumed to be met by groundwater pumping.

The Baseline and Baseline with Climate Change scenarios reflect the current level of pumping, plus the expected change in demand from municipal, golf, and agricultural uses (it was assumed the increase in demands for the "Other" category is satisfied by other water sources). For the scenarios with planned source substitution projects, pumping volumes are reduced by the expected direct delivery volumes. Most notably, the planned Oasis project will supply up to 32,000 AFY of imported water to growers in the East Unincorporated area, about 25,000 to 27,000 AFY which previously relied on groundwater and therefore pumping in the area is reduced by an equal amount. Groundwater pumping amounts are shown dark blue on Figure 7-27.

7.6.3 Other Predictive Model Inputs

In addition to the inflow and outflow model input datasets, several other model input parameters and future boundary conditions were defined for the future scenario simulations.

- The model grid initial groundwater elevation conditions for all predictive scenarios, beginning on January 1, 2020, were set to the values from the final historical simulation ending December 31, 2019.
- The Salton Sea, simulated as a MODFLOW General Head Boundary, was assigned future sea elevations for 2020 to 2069, based on the modified Salton Sea Accounting Model (Tetra Tech and Salton Sea Authority, 2016). Sea level elevations are predicted to decline from -238 ft msl in 2020 to -250 ft msl in 2069, and this decline was applied to the GHB representing the Sea.
- Drains and evapotranspiration zones were unchanged relative to the historical model for all scenarios simulated.

In addition, a subset of 12 monitoring wells (see Chapter 10, *Monitoring Program*) were used as future observation wells for the predictive model simulations. The wells are distributed in the West Valley, Mid Valley, and East Valley areas, and future simulated water levels for each scenario are plotted in a series of hydrographs for each well) (see Section 7.7.1.2).

7.7 Results

Modeling results are presented first in Section 7.7.1 for the Baseline and Baseline with Climate Change scenarios, allowing direct evaluation of the effect of simulated climate change on groundwater levels and storage. Results are shown in terms of the respective water balances, cumulative change in storage, selected hydrographs, and groundwater level change maps.

Section 7.7.2 presents modeling results for all four scenarios with climate change: Baseline with Climate Change, 5-Year Plan with Climate Change, Future Projects with Climate Change, and Extended Agriculture with Climate Change. Results of these scenarios are shown together to allow comparison in terms of model inflows, simulated pumping, simulated drain flow, simulated net outflow to Salton Sea, hydrographs, and maps showing change in groundwater levels.

7.7.1 Baseline Scenarios - Impact of Climate Change

As discussed in 7.5.1, two separate future hydrological periods were developed so that the GSAs could assess the impacts of climate change. The Baseline scenario was run assuming no change in hydrologic conditions (repeated local hydrology of 1970 to 2019). A second simulation was run for Baseline with Climate Change (repeated local hydrology 1995 to 2019 two times - first backward and then forward). The availability of imported water is also impacted by expected climate change. As discussed in Section 7.5.2 and 7.6.1, SWP reliability is assumed to be reduced by an additional -1.5 percent and Colorado River water deliveries are assumed to be reduced by 24,500 AFY under the climate change scenario as compared to Baseline by 2045.

7.7.1.1 Water Budget – Baseline Scenarios

Figure 7-28 shows the water balances for the scenarios of Baseline and Baseline with Climate Change for the 50-year period 2020 to 2069.

The Baseline scenario (upper Figure 7-28) reflects the expected inflows from natural infiltration and imported water based on the repeated hydrologic conditions of the past 50 years. Mountain front and stream recharge observed over the past 50 years was repeated as model input, and imported water was reduced by an additional -1.5 percent to account for decreased availability of SWP supplies, and Colorado River supplies were reduced by -24,500 AFY, as discussed in Section 7.5.1 and 7.5.2. The chart shows the simulated total annual inflows and outflows between 2020 and 2069 by source, along with simulated annual (black line on the chart) and cumulative (orange line on chart) change in storage. A key difference between the Baseline scenario and Baseline Scenario with Climate Change is the hydrological variability. The Baseline scenario is characterized by a high average inflow due in part to several wet years that occurred in the 50-year period. These wet years, which occur early in the simulation, provide an increase in storage that serves as a buffer for the end of the model simulation when drought conditions reduce change in storage. Over the planning period, the model simulation shows a 486,000 AF increase in storage by the end of 2045.

In contrast, Baseline with Climate Change (lower Figure 7-28) simulates a drier period of record, with the last 25 years repeated twice and with reductions in imported water (Section 7.5.2). The climate change scenario begins the simulation with drier conditions and does not include the very wet years previously observed in the basin. Without the wet years, the annual change in storage remains close to zero and inflows and outflows generally balance, but cumulative storage does not increase in the early years as in the Baseline. In fact, by the end of the 25-year planning period after drought conditions are repeated, the model shows a cumulative decline in storage amounting to 96,000 AF. Climate change is also assumed to impact imported water availability. While all scenarios assume 45 percent reliability of SWP supplies, the climate change scenarios assume an additional reduction in reliability of -1.5 percent by year 2045. Further, given the tendency to recurring drought in climate change conditions, those scenarios assume CVWD will contribute to California's *Lower Basin DCP* allotment for Colorado River water.

Figure 7-29 shows the cumulative change in groundwater storage for Baseline and for Baseline with Climate Change. The impact of additional inflow in the early part of the simulation in the baseline scenario is evident. By 2033, the Baseline scenario has an additional 553,000 AFY more groundwater in storage over Baseline with Climate Change and by 2044, the Baseline scenario has a cumulative change in storage of 631,000 AFY more than the Baseline with Climate Change. For the rest of the model simulation, 2045

to 2069 when hydrology is the same for both scenarios, this difference in cumulative storage is maintained because both simulations use the observed data from most recent 25 years for this period.

Figure 7-28. Annual Model Water Budget for Baseline with Climate Change

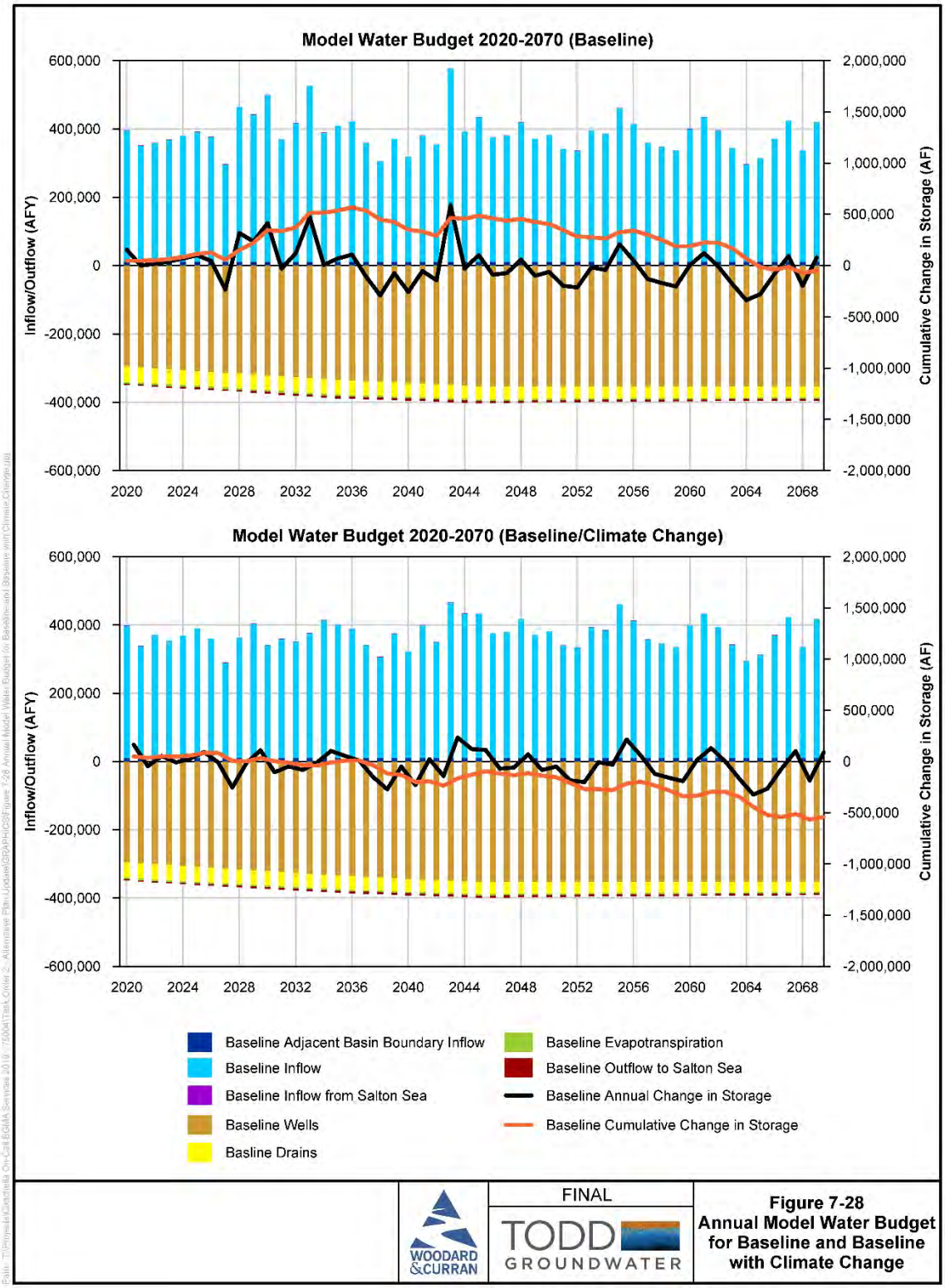
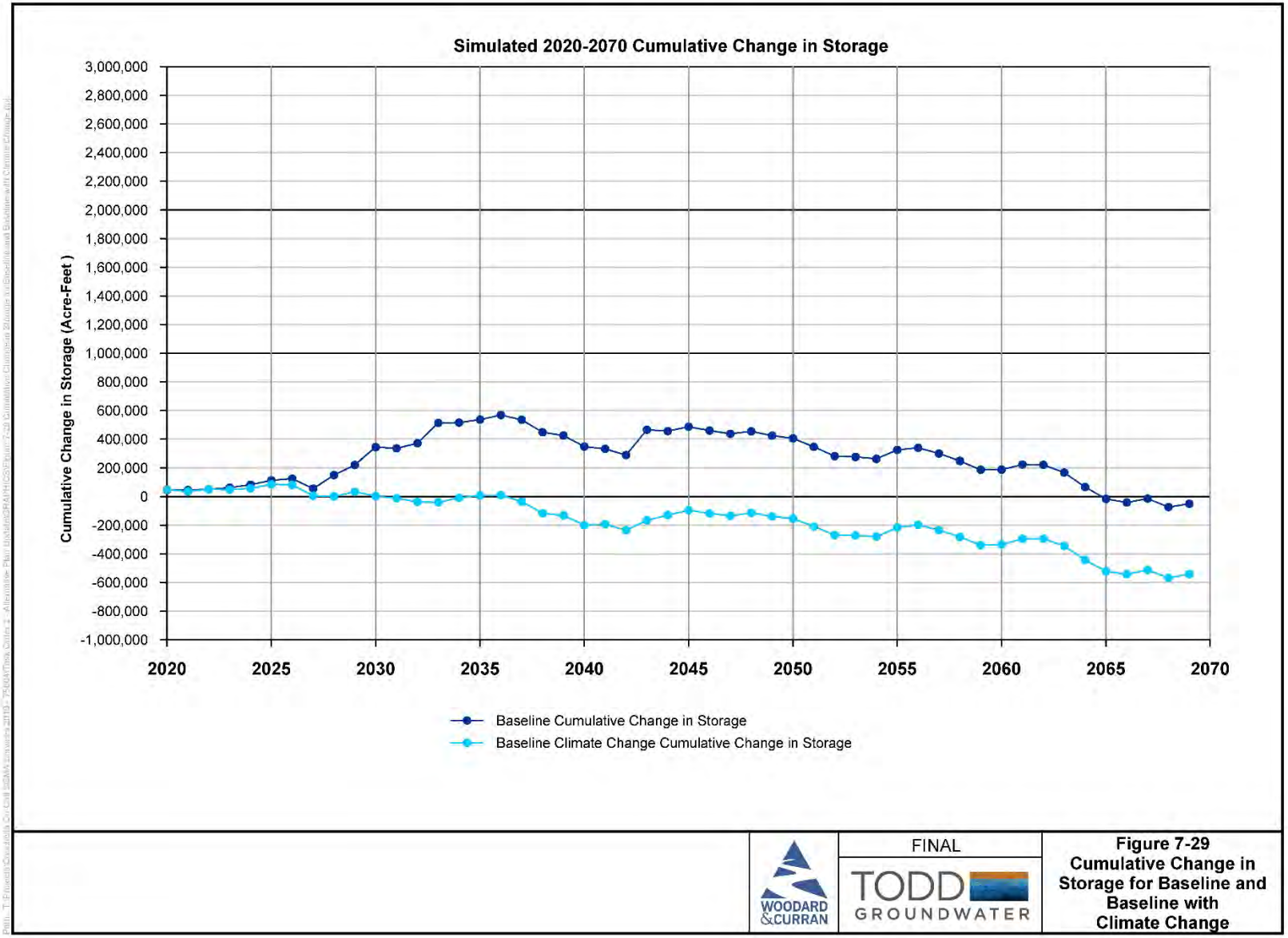


Figure 7-29. Cumulative Change in Storage for Baseline and Baseline with Climate Change



These scenarios reflect the same management actions and existing projects. The only difference is the projected hydrology with and without climate change, which is beyond the control of the GSAs. Because the actual future hydrology is unknown and will likely be affected by climate change, it is critical that GSAs assess their existing and planned projects assuming constraints to local and imported surface water supplies. Simulating the management actions and projects under a range of hydrologic conditions helps to evaluate the effectiveness of these actions.

7.7.1.2 Simulated Hydrographs – Baseline Scenarios

Simulated water levels from the 12 model observation wells were used to illustrate the predicted groundwater level changes for Baseline and Baseline with Climate Change. Simulated 1997 to 2019 water levels for the wells are included to provide context for the future scenarios.

Figure 7-30 and Figure 7-31 show the simulated groundwater elevation hydrographs for Baseline and Baseline with Climate Change scenarios in the West Valley and East Valley, respectively. Historical groundwater levels are shown in black. Baseline conditions are shown with solid blue lines on the graphs, while Baseline with Climate Change levels are shown as the dashed lines. All hydrographs use a 300-foot elevation range on the hydrographs.

West Valley/Palm Springs Subarea

The three observation wells in the Upper West Valley/Palm Springs Subarea (hydrographs along the left side of Figure 7-30) show dynamic fluctuations associated with recharge events at the WWR-GRF, with water level mounding and recovery cycles muted in wells located down the valley. For both scenarios, the larger fluctuations are observed in Well 03S04E20F01S near the WW-GRF, as was observed in historical level trends. Predicted fluctuations in well 03S04E34R01S in Palm Springs are lower but still reflect water level fluctuations associated with the wet/dry replenishment cycles at the WW-GRF and show a net rise of around 50 feet by 2045, followed by a decrease from 2045 to 2070. Well 04S05E17Q02S farther southeast shows increases of around 40 feet by 2045 with minor dampened fluctuations possibly associated with the WWR-GRF, but also potentially influenced by simulated replenishment at PD-GRF to the south. Predicted groundwater elevations for Baseline for well 03S04E34R01S in Palm Springs are around 60 feet higher than for Baseline with Climate Change at 2045, while predicted levels in Well 04S05E17Q02S are around 30 feet higher in 2045. Levels in both wells show a slight increasing trend between 2020 and 2045, then a stable or slight declining trend for 2045-2070, reflecting the later lower inflow amounts. Overall groundwater levels in this Subarea are proportional to the groundwater recharge. Future conditions mirror future recharge– in wet years water levels rise and in dry years water levels decline.

West Valley/Garnet Hill Subarea

The two observation wells in the Garnet Hill Subarea (hydrographs along the top of Figure 7-30) show increasing water level trends for both scenarios. Water levels in Well 03S04E17K01S in the northern portion of Garnet Hill and Well 03S05E30G01S in the southern portion of Garnet Hill are predicted to rise 60 to 80 feet by 2045. Part of the water level rise is due to the MSWD Regional WRF that is expected to percolate treated water in the Baseline scenario.

Figure 7-30. Model Baseline Scenario Hydrographs, West Valley 2020-2069

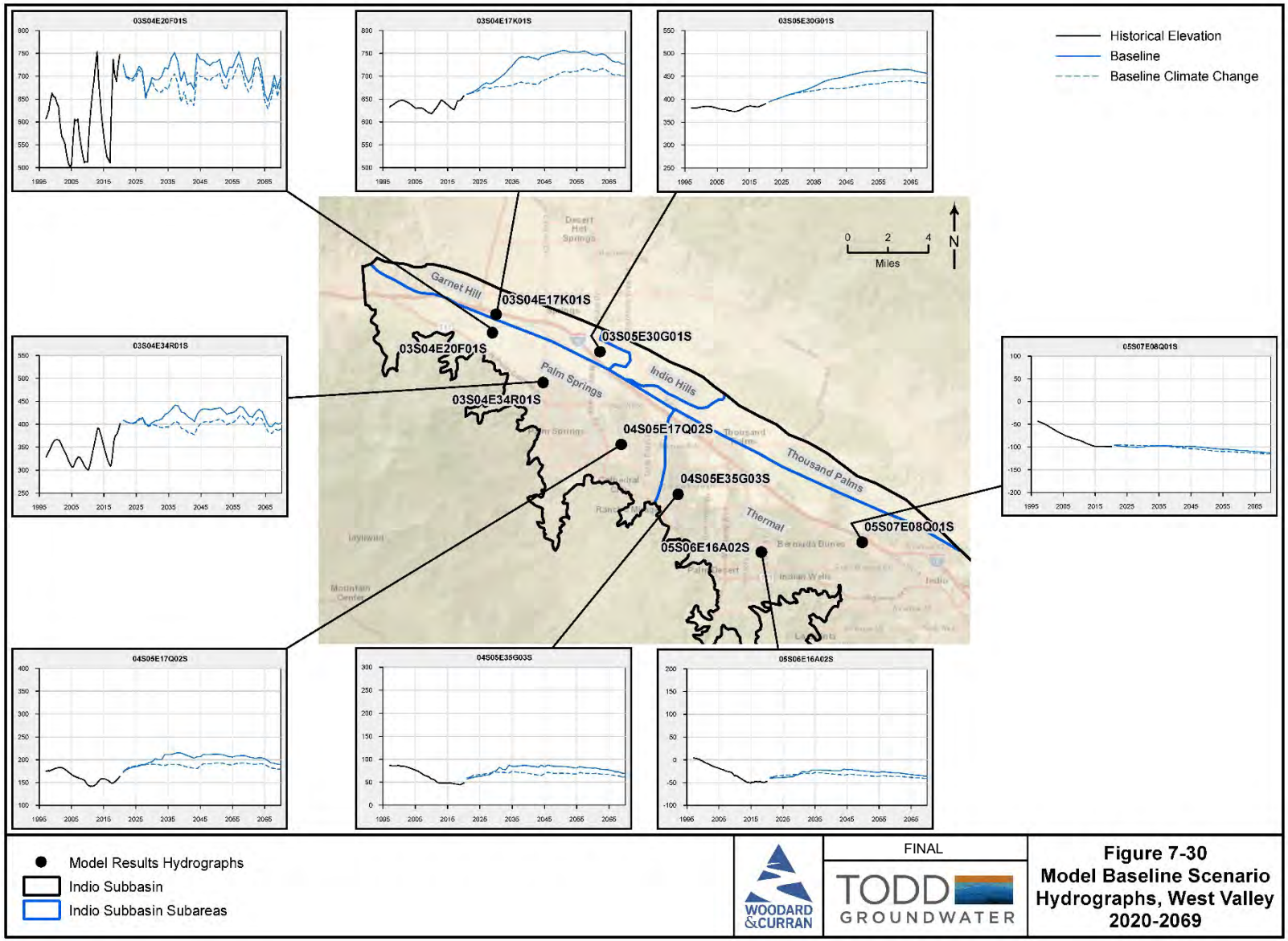
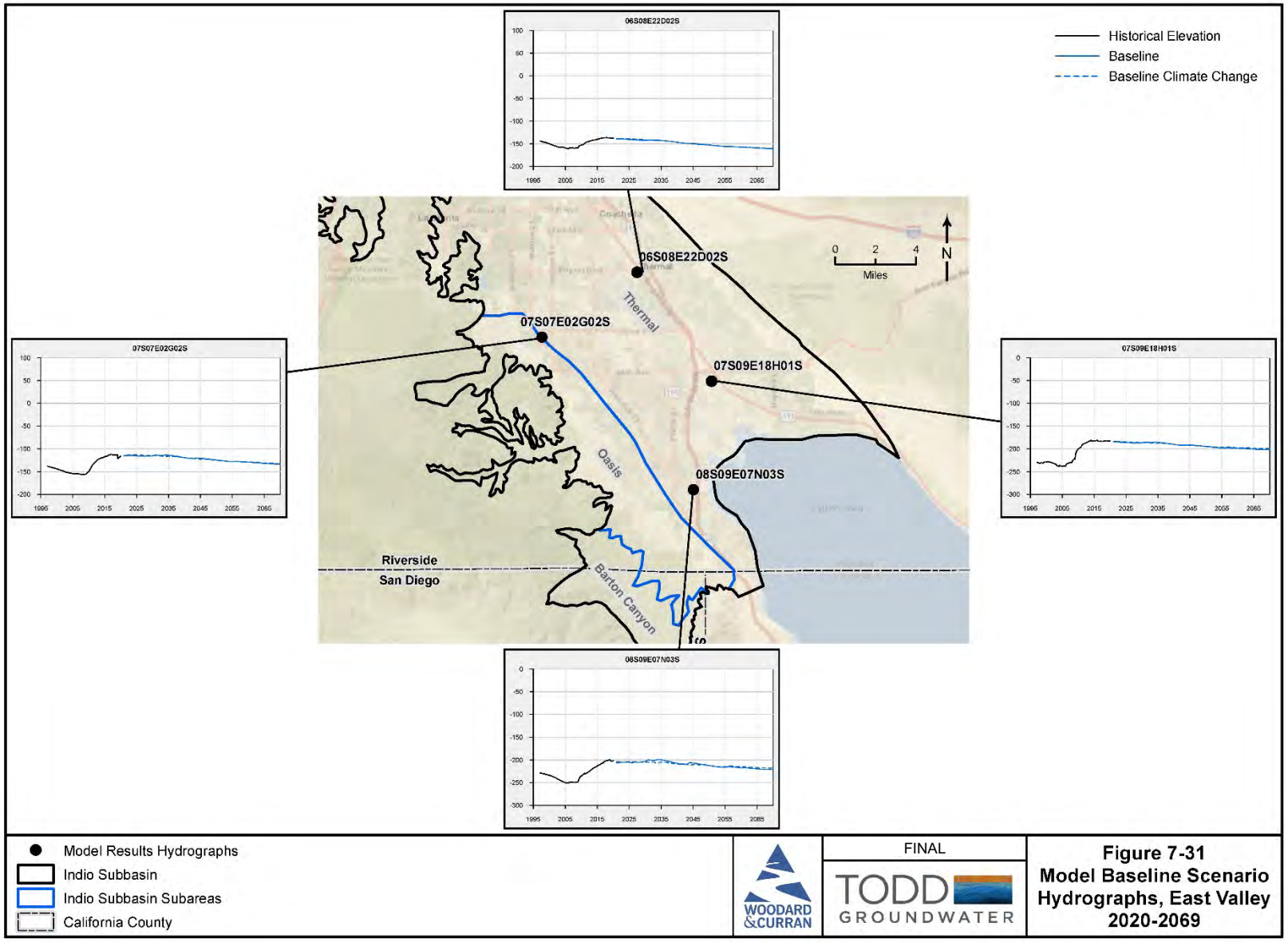


Figure 7-31. Model Baseline Scenario Hydrographs, East Valley 2020-2069



West-Valley/Cathedral City to Indio Area

Predicted water levels in the three observation wells in the mid- and lower-West Valley/ Cathedral City to Indio area (hydrographs along the bottom of Figure 7-30) show slightly increasing to stable trends for the Baseline scenario. Water levels in Wells 04S05E35G03S and 05S06E16A02S in the Rancho Mirage and Palm Desert areas show increasing levels of around 40 feet, in part due to replenishment at WWR-GRF and PD-GRF. Baseline levels in Indio Well 05S075E08Q01S are predicted to be relatively stable from 2020 to 2070. For Baseline with Climate Change, predicted levels in all four wells are around 20 feet lower than for Baseline, the result being only modest increases in levels in the Rancho Mirage and Palm Desert wells, and slightly declining levels in Indio between 2045 and 2070.

East Valley/La Quinta, Thermal, Mecca, and Oasis Areas

Predicted water levels in the four observation wells in the East Valley areas (Figure 7-31) show stable to slightly decreasing trends for the Baseline scenario. Only minor differences are observed in the simulations for the Baseline with Climate Change scenario.

7.7.1.3 Simulated Change in Water Level Maps – Baseline Scenarios

Simulated changes in water levels for the Baseline and Baseline with Climate Change scenarios between 2009 and 2045 are shown (Figure 7-32 and Figure 7-33)**.** 2009 was selected as the period for comparison because it generally reflects historically low groundwater elevations in most of the Subbasin, and these values are used as sustainability criteria for groundwater levels. As detailed in Section 7.5, the Baseline scenarios reflect no new additional projects and the two model simulations simulate different future hydrologic conditions to assess the range of possible outcomes of this no project scenario.

These color-fill contour maps illustrate predicted spatial trends in water level declines or increases across the Subbasin for the scenarios. Simulated changes in water levels are shown for Model Layer 4, representing the deep aquifer. Figure 7-32 shows the predicted change in groundwater levels between the recent historical low, 2009, and the end of the planning period, 2045, for the Baseline scenario and reveals that minor declines (less than 25 feet) would occur in a small area north of the Mid-Valley around Indio. Groundwater level increases would occur in the uppermost West Valley, Garnet Hill, and most of the lower East-Valley areas.

Figure 7-33 shows the predicted changes in levels for Baseline with Climate Change and shows that larger declines (up to 50 feet) would occur under this scenario in the Mid-Valley area north of Palm Springs. Smaller groundwater level increases are predicted in the uppermost West Valley, Garnet Hill, and most of the lower East-Valley areas, as compared with the Baseline scenario.

Figure 7-32. Change in Groundwater Levels, 2009-2045 Baseline Scenario

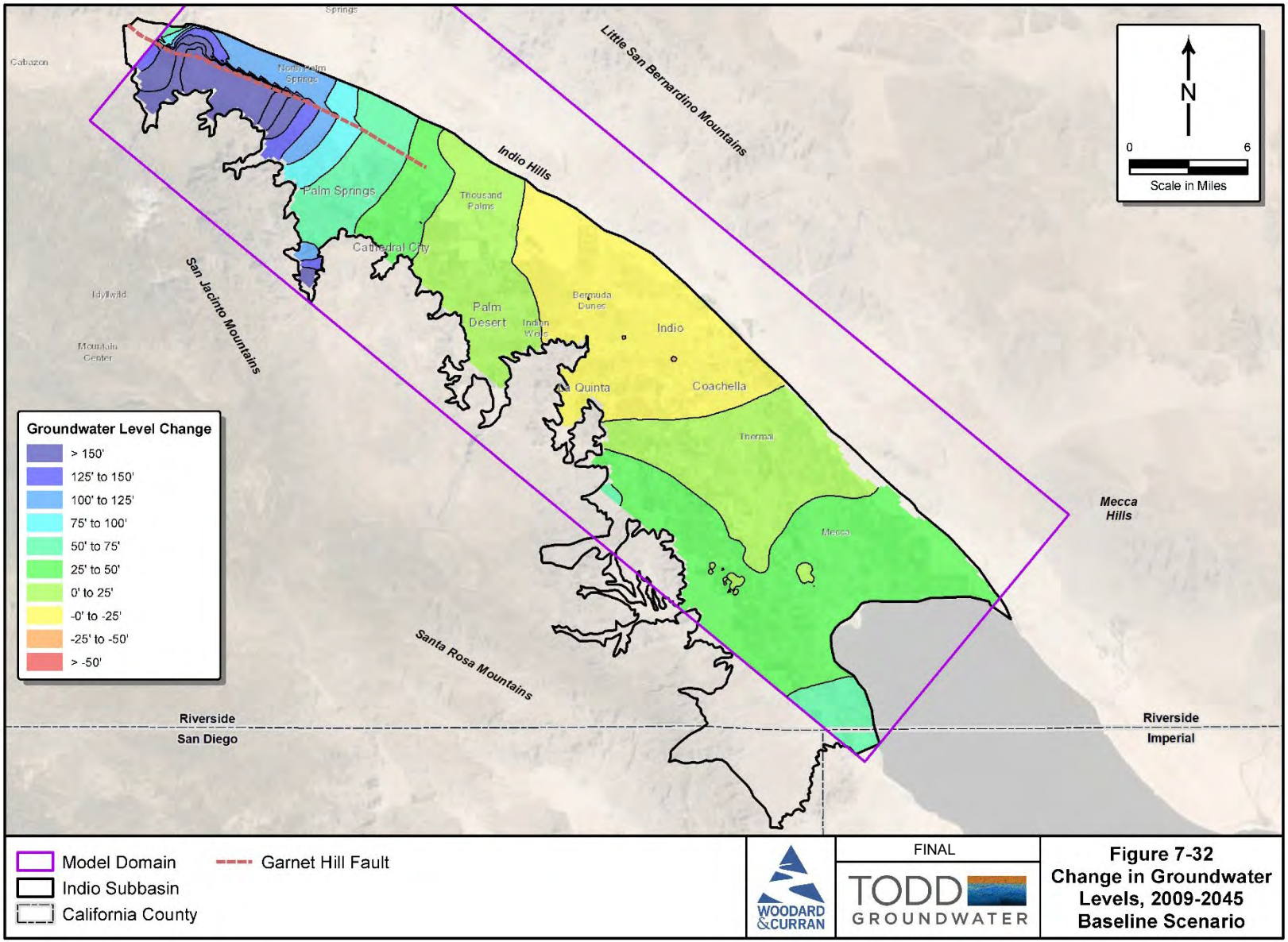
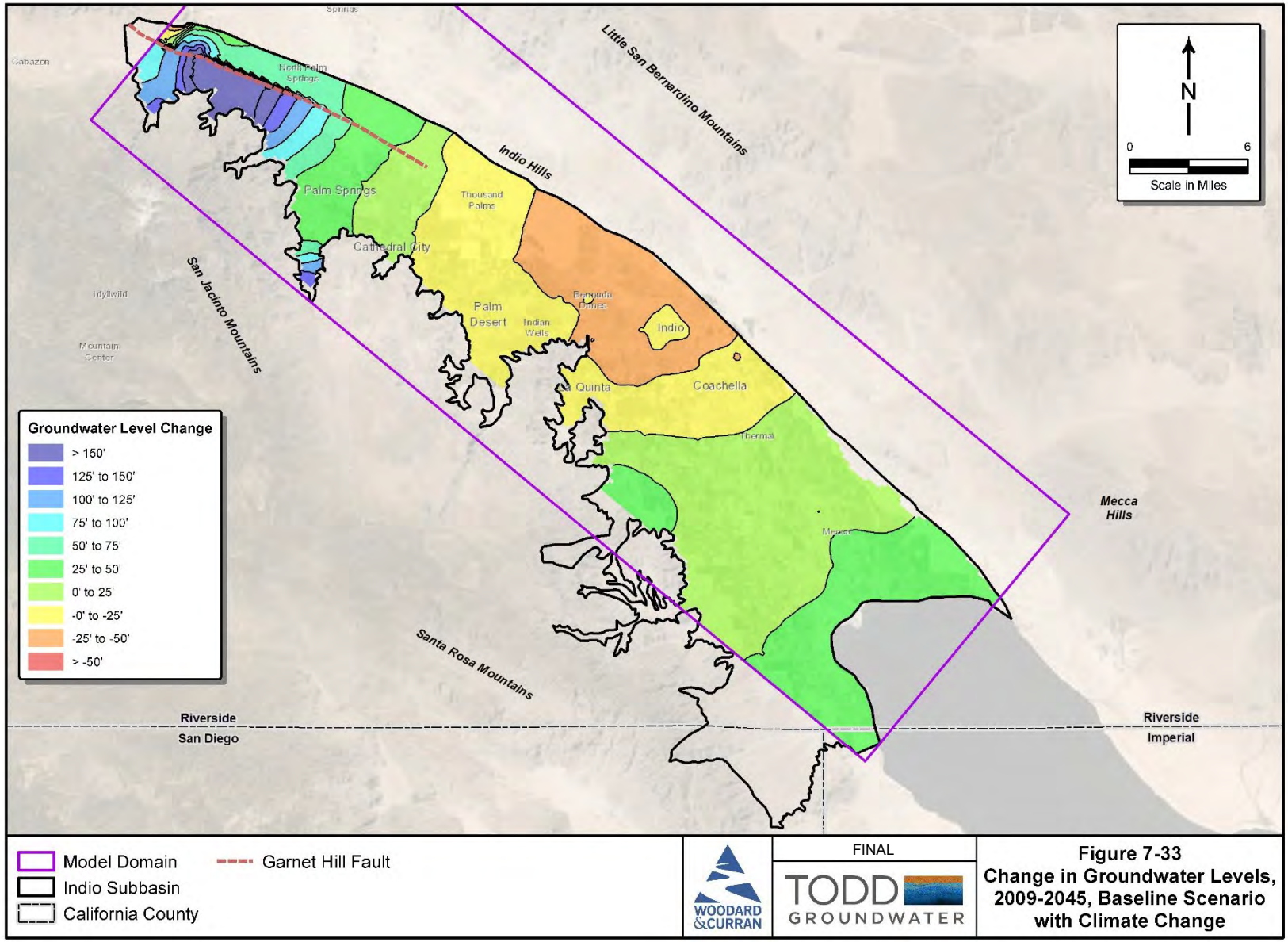


Figure 7-33. Change in Groundwater Levels, 2009-2045, Baseline Scenario with Climate Change



7.7.1.4 Baseline Scenarios Summary

Collectively, the simulated hydrographs and changes in water levels maps for the Baseline and Baseline with Climate Change scenarios indicate that both local increases in future groundwater levels and decreases in levels are predicted. The local differences may be due in part to assumptions regarding the future distributions of replenishment at the GRFs, return flows, and pumping. Regardless, a net increase in Subbasin-wide storage is predicted for the Baseline scenario, while a decrease in total Subbasin storage is predicted for Baseline with Climate Change. In the climate change scenario, simulated groundwater levels are up to 25 feet lower in portions of the Mid-Valley with smaller increases in levels in the West and East Valley than in the baseline scenario without climate change.

The baseline scenarios with and without climate change simulate the same management scenarios under different future hydrology. The differences in water levels and the water budget scenarios highlight the potential range of response under different hydrology, a variable that is not controlled by the GSAs. The baseline scenario with climate change indicates a negative change in storage and does not meet the sustainability goals defined by the GSA. To prepare for an uncertain future, the GSAs are planning for impacts from climate change by assessing future management scenarios under the climate change hydrology and also through adaptive management that will assess the changing groundwater basin.

7.7.2 Climate Change Scenarios – Baseline and with Projects

In addition to the Baseline with Climate Change scenario, three other scenarios were simulated to assess planned projects and supply conditions in the near-term (5 years) and planning horizon (25 years) on the Subbasin. These four scenarios were simulated with both the 50-year hydrology and the climate change hydrology. Only the climate change versions of those scenarios are presented here, as the Indio GSAs are committed to achieving sustainability under changing climate conditions.

7.7.2.1 Water Budget – Scenarios with Climate Change

As described in Section 7.5, additional future scenarios were developed to simulate projects included in the GSAs' 5-year capital improvement plans, future projects, and potential expanded agricultural areas. Natural inflow, municipal return flows, and golf return flow amounts remain the same for each scenario. As shown on Figure 7-27, average inflow for groundwater replenishment and wastewater percolation differs between scenarios, reflecting the addition of projects that utilize imported and recycled water for direct use rather than indirect use through replenishment and percolation. Of the scenarios simulated with climate change, the Baseline with Climate Change scenario simulated the greatest average annual inflow to the Subbasin (more than 408,000 AFY) because of increased direct use under other scenarios, while Expanded Agriculture with Climate Change simulates the least inflow (367,000 AFY). However, the difference between these scenarios for the planning period (2020 to 2045) is only ten percent of the total inflow.

Figure 7-34 shows total inflow for all scenarios with climate change assumptions. Note the peaks and valleys are a product of simulating annual variability for wet and dry years. Hydrology plays a critical role for basin inflows because natural infiltration varies based on year type and the volume of available SWP exchange water also varies greatly based on year type. As shown on Figure 7-27, the Future Projects with Climate Change scenario has less average inflow in the first 25 years than Baseline, Baseline with Climate Change, and 5-Year Plan with Climate Change scenarios; this reflects the assumed new source substitution projects coming online to deliver Canal water directly to users. The Expanded Agriculture shows the least

total inflow because additional imported water is delivered to users to meet the increased demand, rather than recharged at GRFs.

Figure 7-35 shows the differences in pumping between the scenarios. As described above, planned source substitution projects will increase the volume of direct deliveries of imported and recycled water and offset a comparable volume of pumping. As described in Section 7.5, these volumes differ among scenarios based on simulated projects. The Baseline scenario assumes expected increases in demand will be satisfied by increased pumping. For the 5-Year Plan with Climate Change and Future Projects with Climate Change scenarios, the new direct delivery connections decrease pumping. The Expanded Agriculture with Climate Change scenario shows a slight increase in pumping over the Future Projects with Climate Change scenario, reflecting an expected increase in agricultural pumping due to the increase in demand. Fifteen percent of the new irrigated agricultural area is assumed to be served by groundwater, with the rest served through direct delivery of Canal water.

Figure 7-36 shows the cumulative change in groundwater storage for the four climate change scenarios. In the Future Projects with Climate Change scenario, decreased pumping and similar levels of inflow to the other climate change scenarios result in an increase in groundwater storage of 1,394,000 AF at the end of the 50-year simulation. The Expanded Agriculture with Climate Change scenario shows less cumulative storage change due to increased agriculture pumping and reduced groundwater replenishment as increased demands are met by direct delivery of Canal water. The change in storage for Expanded Agriculture with Climate Change is 588,000 AF at the end of the 50-year simulation, while the cumulative storage change for the 5-Year Plan with Climate Change scenario is 691,000 AF. Baseline with Climate Change is the only scenario that results in a negative cumulative change in storage after the 50-year simulation, approximately 542,000 AF is expected to be removed from storage. All scenarios show a net increase in storage at the end of the 25-year planning horizon, followed by declining storage through 2069 for Baseline with Climate Change only, net stable storage for 5-Year Plan with Climate Change projects, and increasing storage for Future Projects with Climate Change and Expanded Agriculture with Climate Change.

Simulated drain flow for the four climate change scenarios is shown Figure 7-37, along with the historical simulated and observed volumes for comparison context. The volume of drain flows is calculated by the model based on defined drain locations, depths, and hydraulic conductance parameter, and predicted groundwater levels at the drains. When groundwater is simulated as rising to or above the drain elevation, groundwater is removed via the drains, with larger amounts of drain flow predicted for higher groundwater elevations. For the Baseline with Climate Change scenario, drain flows are predicted to decline from around 45,000 to 30,000 AFY. The Future Projects with Climate Change scenario involve a decrease in pumping in the East Valley that results in an increase in drain flow, up to 70,000 AFY. For the Expanded Agriculture with Climate Change scenario, groundwater replenishment is reduced in the scenario at Whitewater and Palm Desert GRF facilities in the East Valley to meet the increased direct delivery demands. This reduction of replenishment, especially at TEL-GRF, results in a decrease of drain flows after 2040 relative to the Future Projects with Climate Change scenario. This can be seen on Figure 7-37 when the volume percolated at TEL-GRF is first reduced, and hydrographs of wells near TEL-GRF (e.g., Well 07S07E02G02S) and drain flows both exhibit declines.

Figure 7-34. Total Model Inflow for Future Scenarios

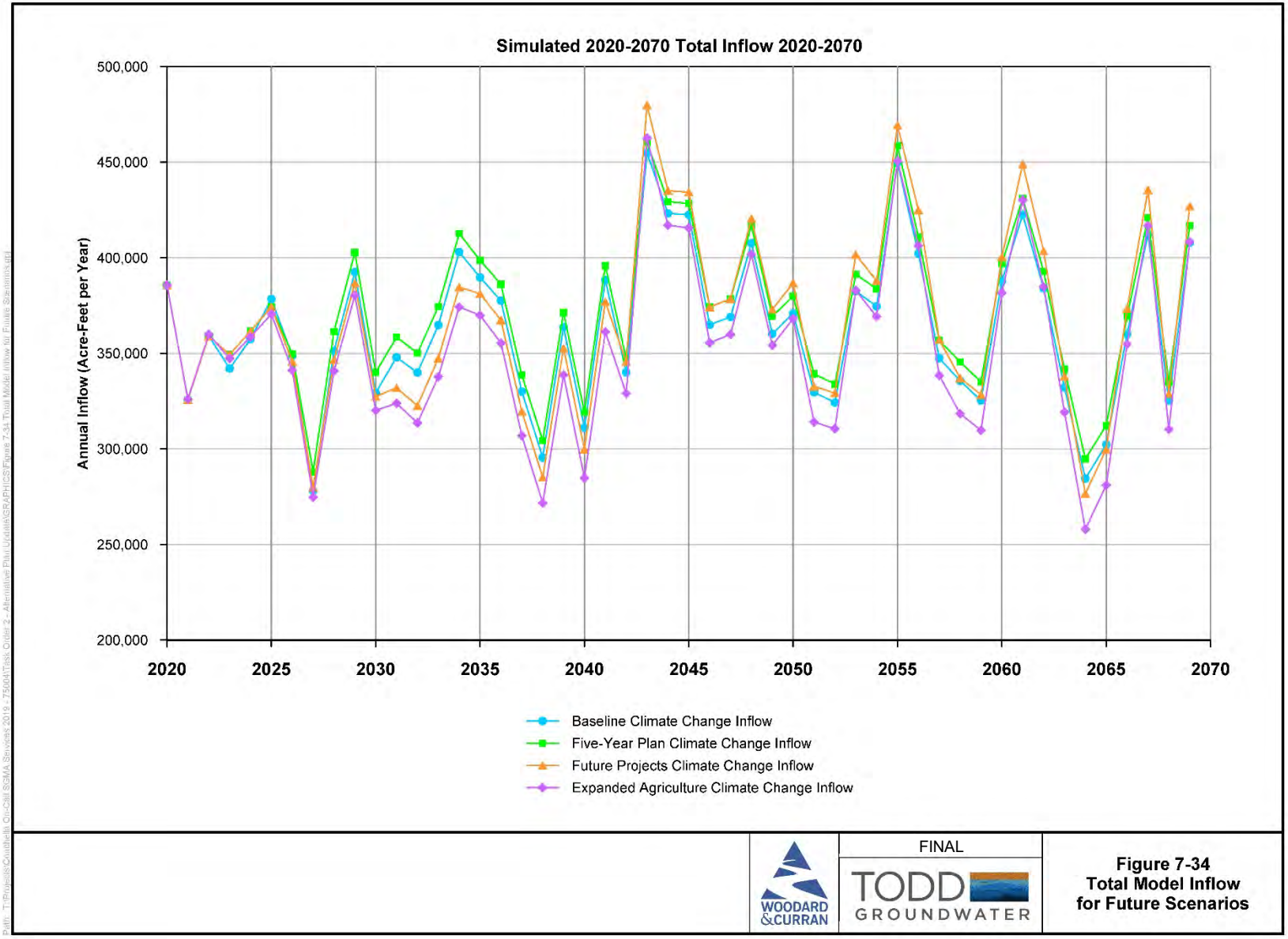


Figure 7-35. Simulated Pumping for Future Scenarios

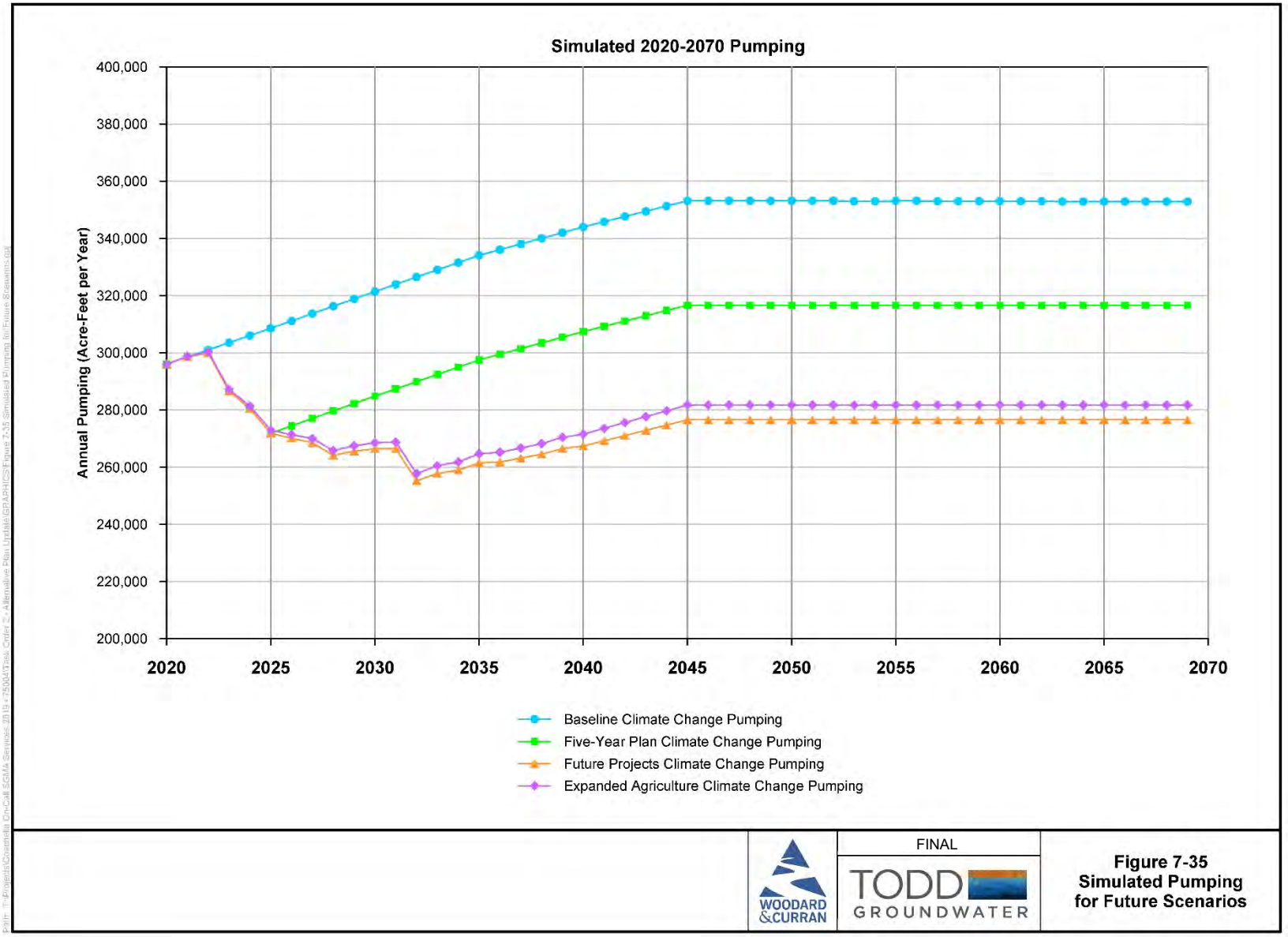


Figure 7-36. Cumulative Change in Storage for Future Scenarios

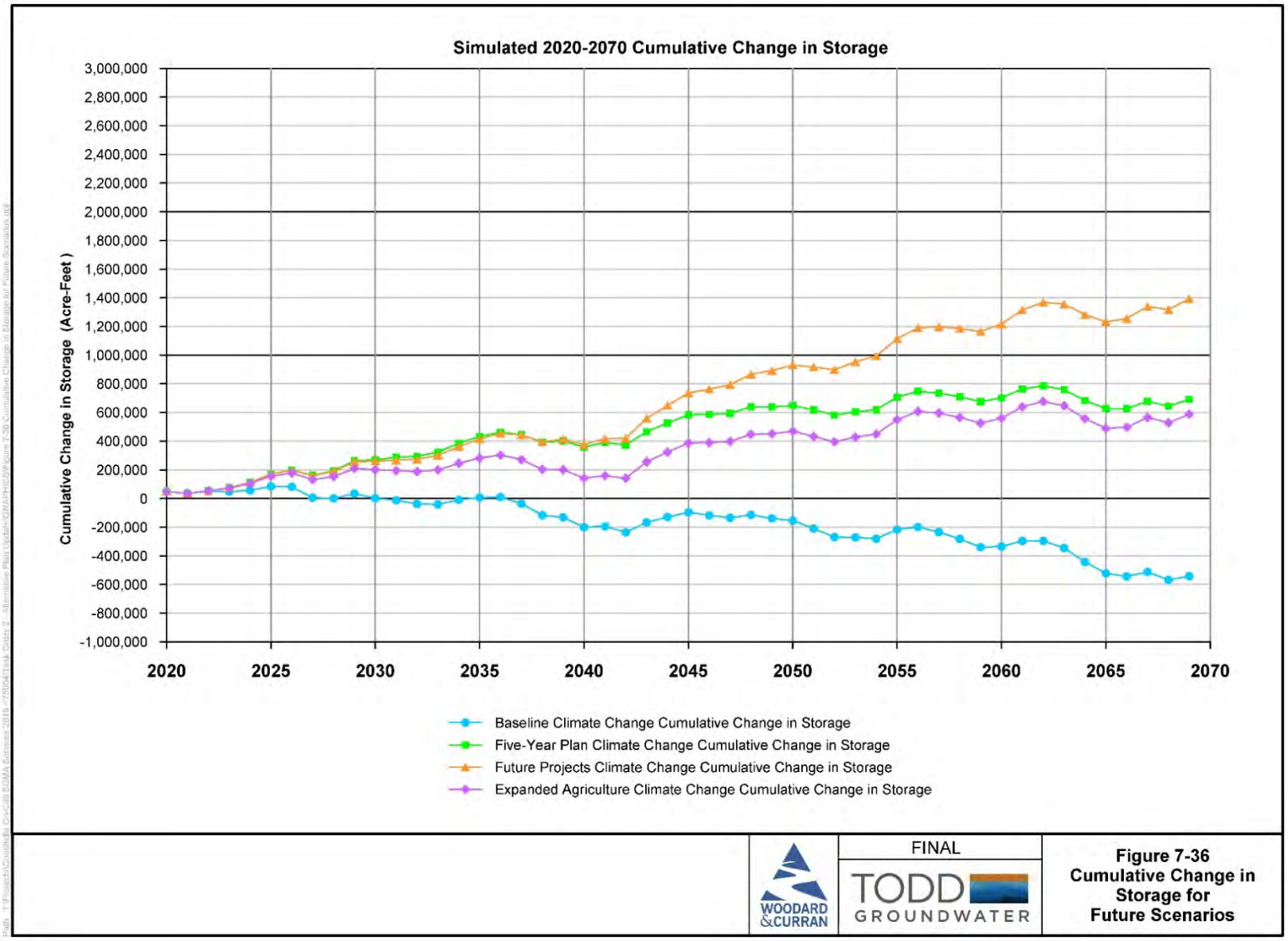


Figure 7-37. Simulated Drain Flow for Future Scenarios

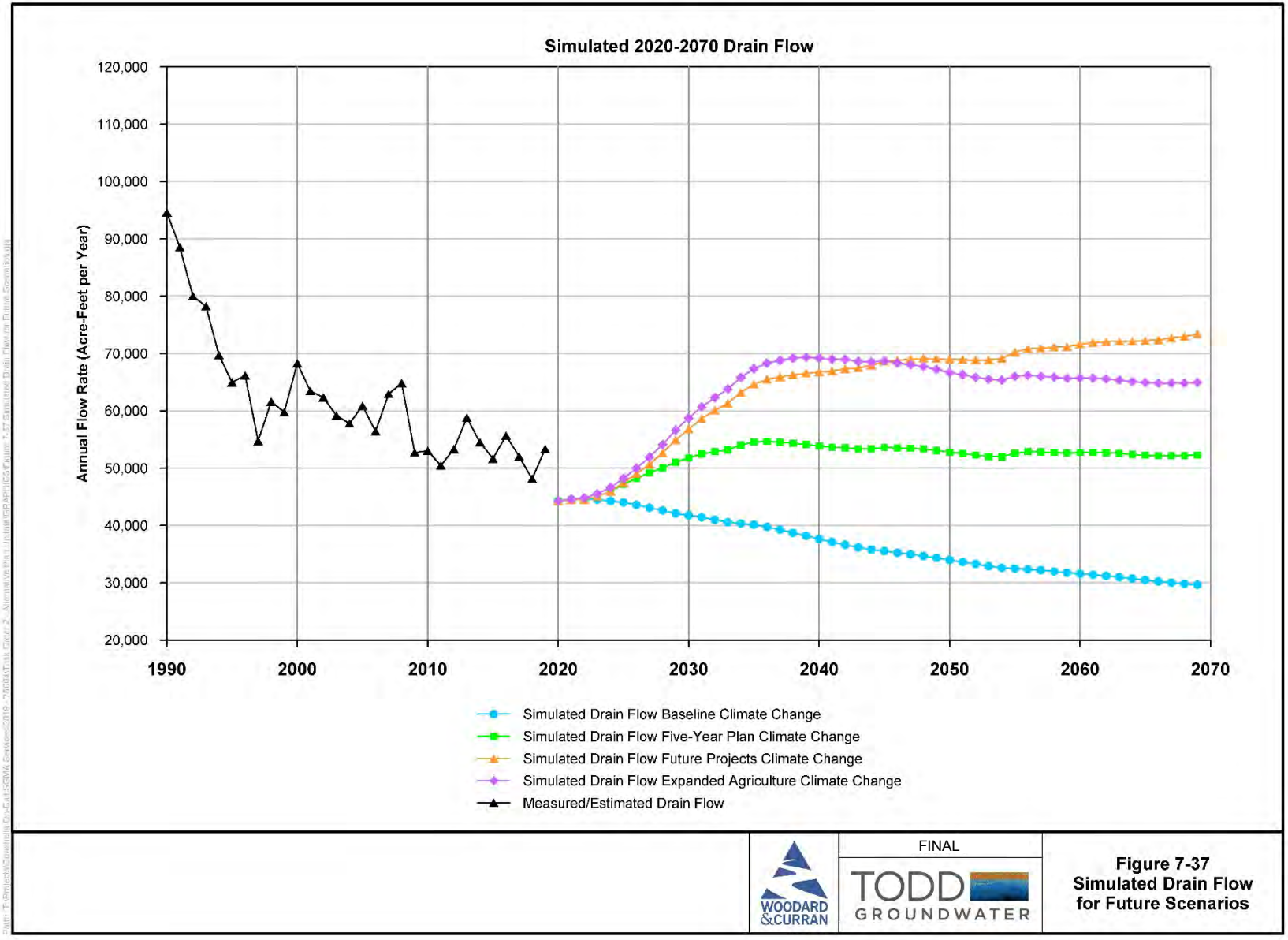


Figure 7-38 shows the net groundwater discharge to the Salton Sea for the four climate change scenarios. Predicted groundwater discharge amounts increase between 2020 and 2045, then stabilize or slightly decline. Discharge at 2045 ranges from approximately 4,800 AFY for Baseline with Climate Change to 5,500 AFY for Future Projects with Climate Change and Expanded Agriculture with Climate Change. The amounts do not vary much between the scenarios, because flow is limited by the relatively low conductance value assigned to the Sea boundary condition and because groundwater levels in the area north of the Sea are partially controlled by the drain system.

7.7.2.2 Simulated Hydrographs – Future Scenarios with Climate Change

Figure 7-39 and Figure 7-40 show the simulated groundwater elevation hydrographs for the four climate change scenarios in the West Valley and East Valley, respectively. Baseline with Climate Change conditions are shown with blue lines on the graphs, 5-Year Plan with Climate Change as the magenta lines, Future Projects with Climate Change as orange lines, and Expanded Agriculture with Climate Change as the green lines.

West Valley/Palm Springs Subarea

The three observation wells in the Upper West Valley/Palm Springs Subarea (hydrographs along the left side of Figure 7-39) show dynamic fluctuations associated with recharge events at the WWR-GRF for all scenarios, with water level mounding and recovery cycles decreasing in magnitude down the valley. The highest groundwater levels in Well 03S04E20F01S near the WW-GRF and in Well 03S04E34R01S in Palm Springs are predicted for the Future Projects with Climate Change scenario, with the lowest levels simulated for the Expanded Agriculture with Climate Change scenario. By the end of the future simulation, Well 04S05E17Q02S farther southeast shows the lowest levels for the Expanded Agriculture with Climate Change scenario.

West Valley/Garnet Hill Subarea

The two observation wells in the Garnet Hill Subarea (hydrographs along the top of Figure 7-39) show increasing water level trends for all scenarios. Water levels in Well 03S04E17K01S in the northern portion of Garnet Hill and Well 03S05E30G01S in the southern portion of Garnet Hill are predicted to rise 30 to 60 feet by 2070, with the largest rises simulated for the Five-Year Plan with Climate Change scenario.

Mid-Valley/Cathedral City to Indio Area

Predicted water levels in the three observation wells in the Mid-Valley/ Cathedral City to Indio area (hydrographs along the bottom of Figure 7-39) show slightly to moderately increasing to stable trends for all scenarios, except the Baseline with Climate Change scenario. Groundwater levels in Well 04S05E35G03S near Rancho Mirage increase 80 feet for the Future Projects Scenario, with Wells 05S06E16A02S in Palm Desert and Well 05S075E08Q01S in Indio also showing the greatest increases for Future Projects with Climate Change. Simulated levels for the 5-Year Plan with Climate Change and Extended Agriculture with Climate Change scenarios also rise in all wells, while levels decline slightly in all wells for the Baseline with Climate Change scenario.

Figure 7-38. Simulated Salton Sea Net Outflow for Future Scenarios

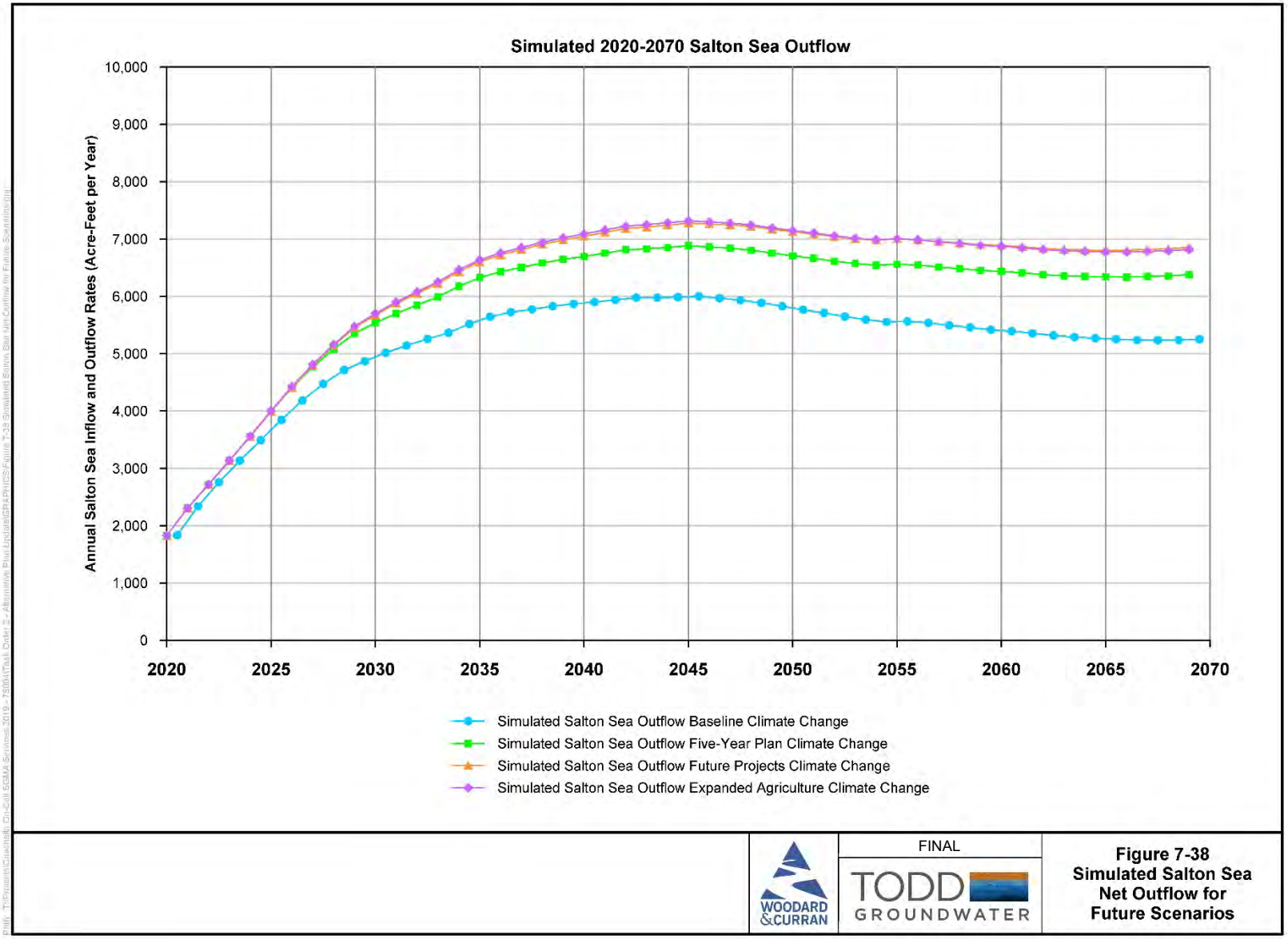


Figure 7-39. Model Future Scenario Hydrographs, West Valley 2020-2069

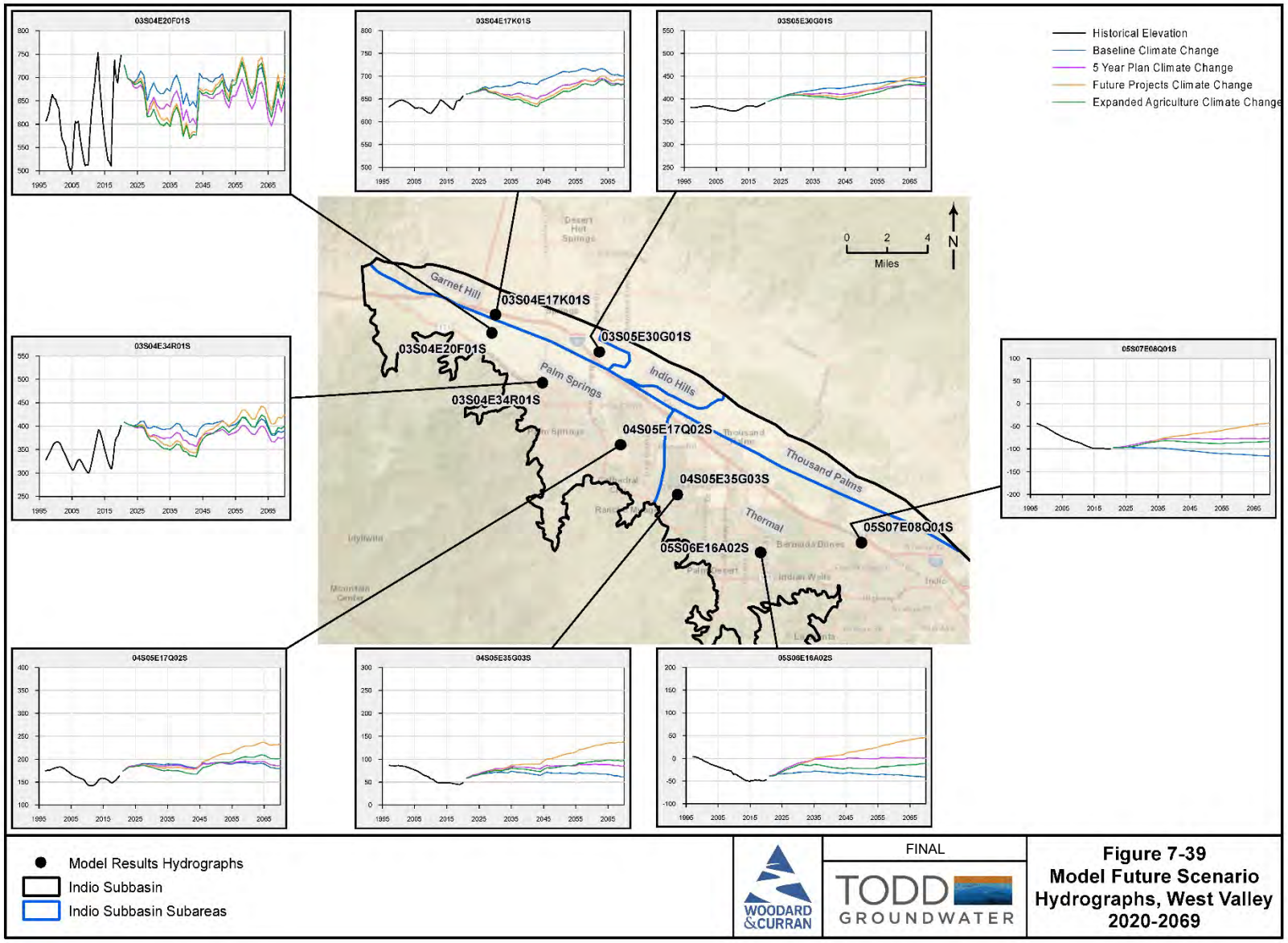
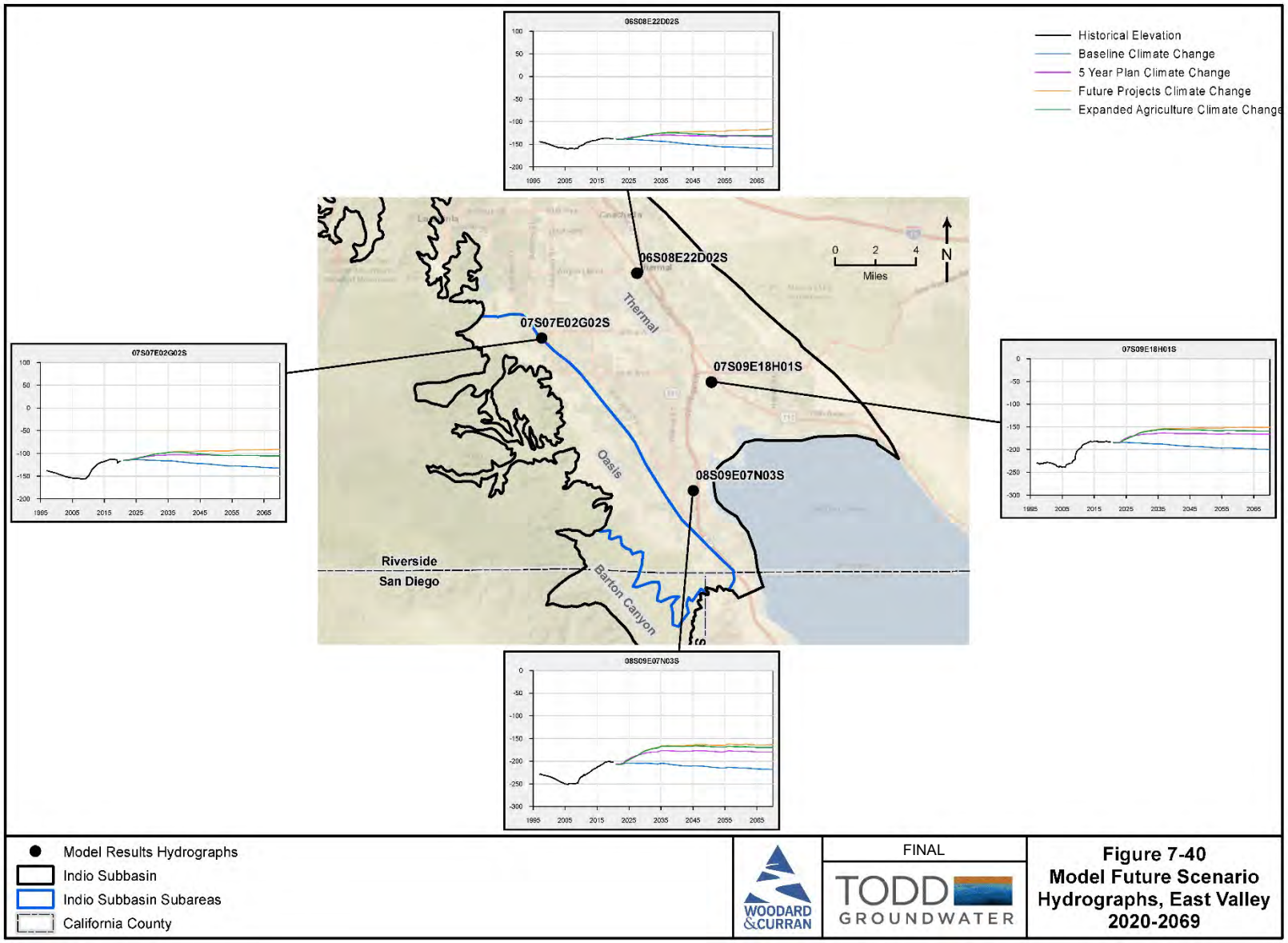


Figure 7-40. Model Future Scenario Hydrographs, East Valley 2020-2069



East Valley/La Quinta, Thermal, Mecca, and Oasis Areas

Predicted water levels in the four observation wells in the East Valley areas (Figure 7-40) show slightly decreasing trends for the Baseline with Climate Change and Extended Agriculture with Climate Change scenarios, while levels rise in all wells for Future Projects with Climate Change and 5-Year Plan with Climate Change scenarios.

7.7.2.3 Simulated Change in Water Level Maps – Future Scenarios

Simulated changes in water levels for the Future Projects with Climate Change, 5-Year Plan with Climate Change, and Extended Agriculture with Climate Change scenarios between 2009 and 2045 are shown on Figure 7-41 through Figure 7-43. Figure 7-41 shows the predicted change in groundwater levels between 2009 and 2045 for the 5-Year Plan with Climate Change scenario and reveals that minor declines (less than 25 feet) are occur in this scenario in a small area near the City of Coachella in the East Valley area. Level increases are predicted in the uppermost West Valley, the southern portion of Garnet Hill, and most of the Mid-Valley and East Valley areas. Level rises in the Mid-Valley may be associated with simulated operation of the PD-GRF.

Figure 7-42 shows the predicted changes in levels for the Future Projects with Climate Change scenario and similar changes occur for this scenario in the West- and Mid-Valley areas. No declines are predicted except in a very small area where the Whitewater River enters the subbasin.

Figure 7-43 shows the predicted change in groundwater levels between 2020 and 2045 for the Expanded Agriculture with Climate Change scenario. Minor declines (less than 25 feet) occur in this scenario in small areas near the Cities of Indio and Coachella. This decline is likely due to the reduction in groundwater replenishment as expanded agriculture increases the direct delivery of imported water. Level increases are predicted in the Upper West Valley and southern portion of the East Valley. These increases in the Upper West Valley are similar to the groundwater elevation rises observed in all scenarios, a result of continued groundwater replenishment at WWR-GRF.

Figure 7-41. Change in Groundwater Levels, 2009-2045, 5-Year Plan Projects Scenario with Climate Change

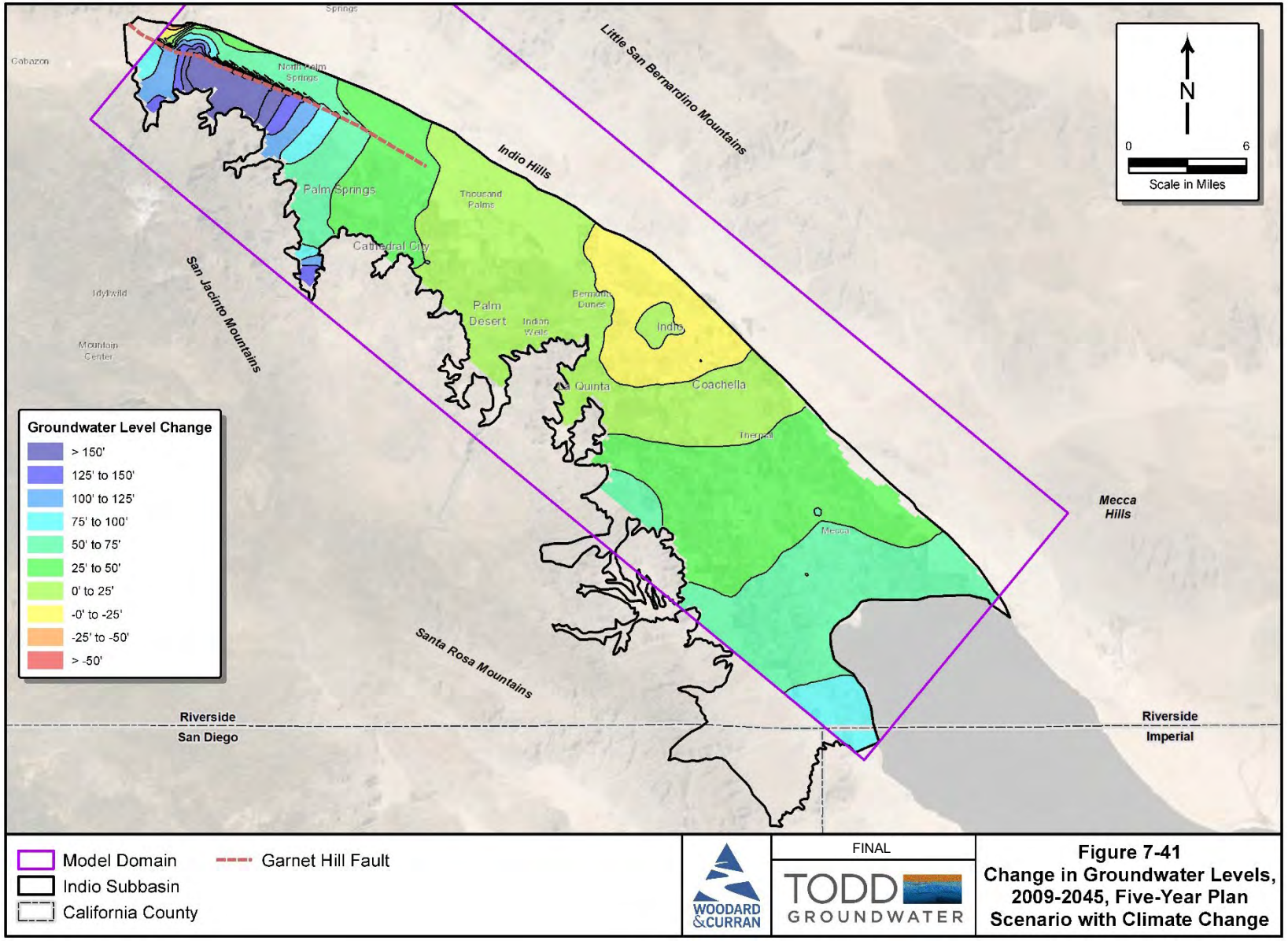


Figure 7-42. Change in Groundwater Levels, 2009-2045, Future Projects Scenario with Climate Change

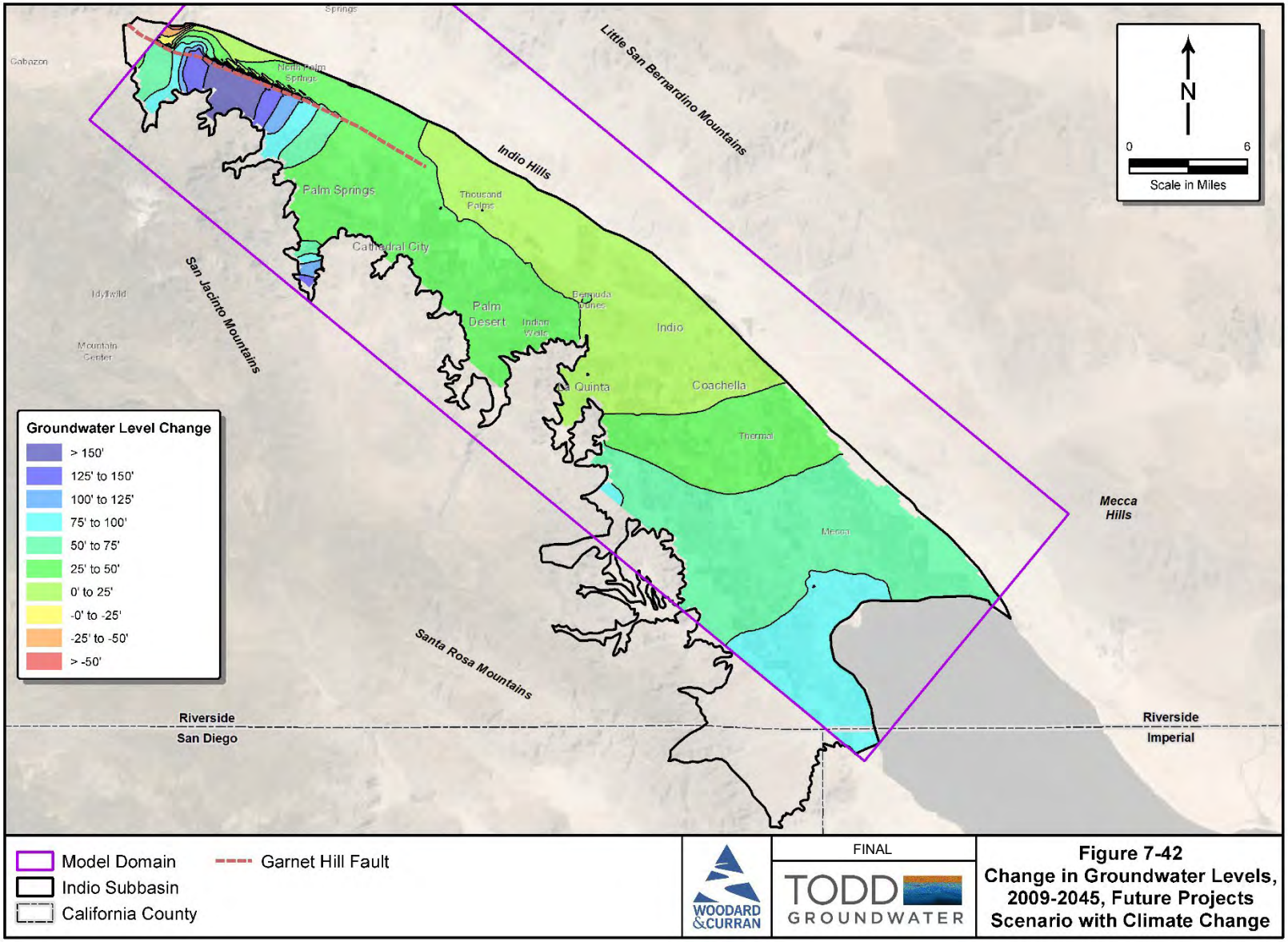
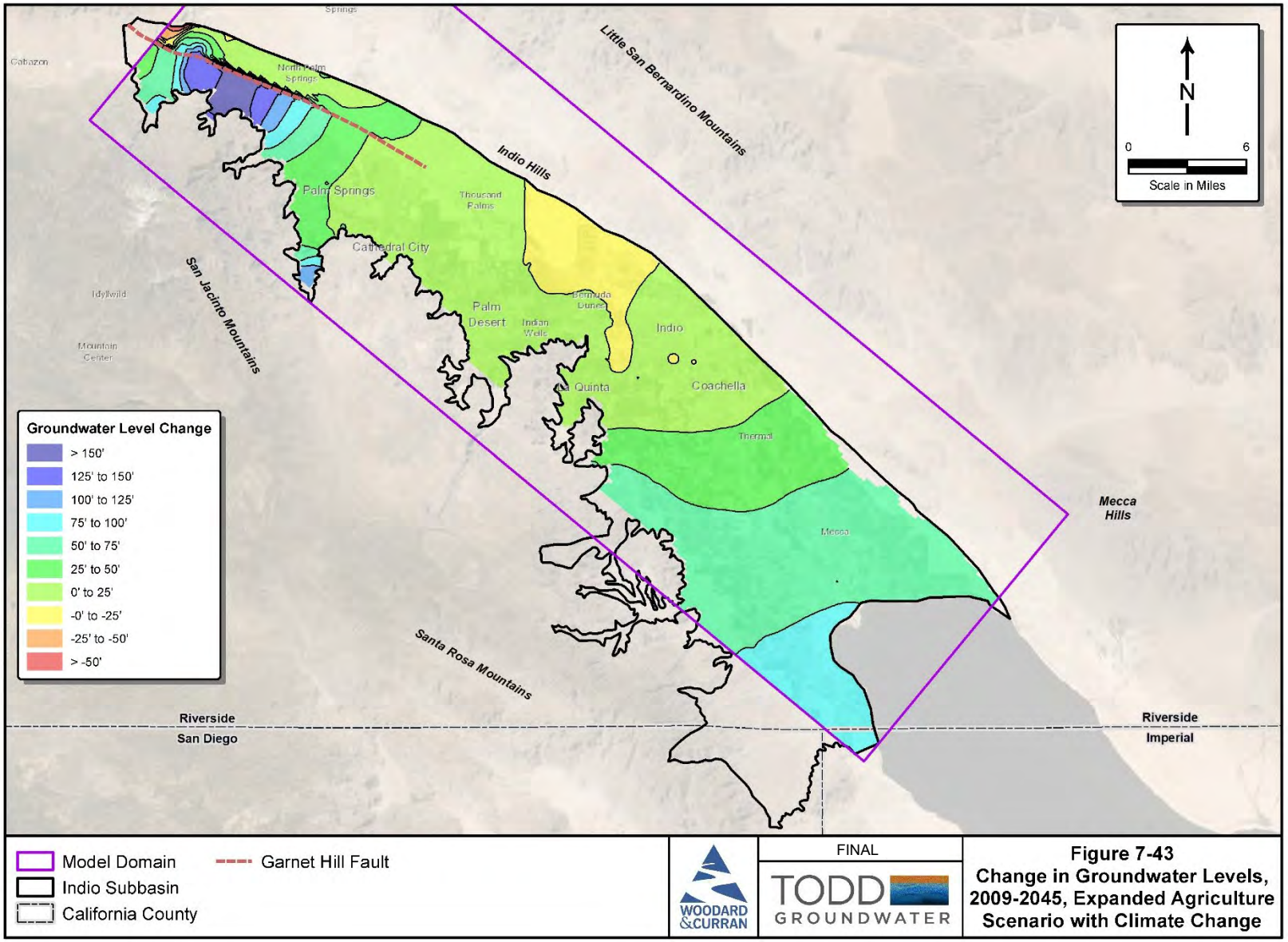


Figure 7-43. Change in Groundwater Levels, 2009-2045, Expanded Agriculture Scenario with Climate Change



7.8 Conclusions

Simulation of the Baseline (No New Projects) and Baseline with Climate Change scenarios allows direct evaluation of the effect of simulated climate change on groundwater conditions. As indicated in this chapter, a net increase in Subbasin-wide storage is predicted for the Baseline scenario, but a net decrease in Subbasin storage is predicted for Baseline with Climate Change. With climate change, not implementing new projects is not sustainable.

The major conclusion from simulation of the other three Plan scenarios—5-Year Plan with Climate Change, Future Projects with Climate Change, and Expanded Agriculture with Climate Change—is that the Indio GSAs can maintain a sustainable Subbasin water balance with planned projects for the near-term and future. The three Plan scenarios involve varying project implementation and/or agricultural demands. For all three of these scenarios, simulation results show a net increase in storage at the end of the 25-year planning horizon and continuing stability through the end of the modeling timeframe. The three scenarios show storage increases in the Mid-Valley and most of the East Valley and varying levels of water level declines in the West Valley, which are an artifact of wet and dry year cycles and the subsequent rapid response of groundwater levels near WWR-GRF. These results demonstrate the importance to the Indio Subbasin balance of a portfolio of projects and management actions that allow adjustments through time and across the Subbasin.

Simulation of the 5-Year Plan with Climate Change scenario shows that already-planned projects and management actions can maintain the water balance, even with climate change, while the Future Projects with Climate Change scenario demonstrates that future projects can address uncertainty in water supply, water demand, and other circumstances and maintain the Subbasin water balance.

While the GSAs have a suite of potential projects that can maintain the Indio Subbasin water balance, adaptive management will be critical when planning for future conditions to ensure the most effective projects are implemented in areas where additional resources are needed.

Mission Creek Subbasin Alternative Plan Update

In Compliance with the Sustainable Groundwater Management Act

Volume I

Prepared For:
Coachella Valley Water District
Desert Water Agency
Mission Springs Water District

November 2021







Coachella Valley region, the general understanding from the Agencies and other water management agencies in the Coachella Valley is that the region could be experiencing ongoing below normal average precipitation conditions with more recurring dry years. As such, the Indio Subbasin and MCSB technical teams and management committees agreed to use the recent observed below normal precipitation condition from 1995 through 2019 as the **Climate Change** scenario for the region. The assumption for this scenario is that climatic conditions of this 25-year period in the Coachella Valley is duplicated to provide the full 50-year hydrologic period. The period was implemented in a reverse order (i.e., 2019 to 1995) for the first 25-year portion of the forecast period, then forward order (i.e., 1995- 2019) for the second 25-year portion of the period. This results in a hydrologic period that starts and ends with multiple dry years. It was also assumed that climate change will impact the reliability of SWP deliveries as described in Section 4.2.4. The Technical Addendum to the 2019 SWP Delivery Capability Report (CDWR, 2020b) provides a "Future Conditions with Climate Change and 45 cm Sea Level Rise Scenario," which projects a further decrease in SWP deliveries over time. The 2019 SWP Delivery Capability Report estimates a future delivery reliability of 58 percent (%) declining to 52% by 2040 (CDWR, 2020a). However, based on the average SWP deliveries since the 2007 Wanger Decision, this Alternative Plan Update recognizes the significant potential reduction in reliability associated with Delta export litigation and climate change, if the Delta Conveyance Facility (DCF) Project is not constructed, and therefore, assumed a SWP delivery reliability of 45% through the planning horizon for all scenarios. In addition, as modeled by CDWR in its 2019 SWP Delivery Capability Report (CDWR, 2020), climate is anticipated to result a decrease of SWP deliveries of 1.5% by 2045.

7.2.3 Summary of Modeled Scenarios for Water Management Forecasting

Each of the three water management scenarios was simulated with and without climate change assumptions. This resulted in a total of six scenarios:

1) Baseline,
2) Near-Term Projects,
3) Future Projects,
4) Baseline with Climate Change,
5) Near-Term Projects with Climate Change, and
6) Future Projects with Climate Change.

The Wood Team and the Management Committee agreed the two scenarios that involve additional projects (Near-Term Projects and Future Projects) and climate change assumptions are reasonable and conservative and should be the focus of MCSB planning. The Baseline scenario is presented with and without climate change for comparison of the impact of the climate change assumptions. Therefore, the following discussion is focused on scenarios 1, 4, 5, and 6. Scenarios 2 and 3 are described in detail in **Appendix B**. Key hydrologic assumptions

incorporated into all the scenarios are described below. Hydrologic assumptions specific to scenarios 1, 4, 5, and 6 are described in Section 7.4.

7.3 Common Assumptions

Several assumptions and hydrologic inputs are common to all the forecast scenarios. These are discussed in the following sections.

7.3.1 Model Domain and Simulation Period

The calibrated MCSB Model summarized above formed the hydrogeologic basis of the forecast model. There were no structural or hydrogeologic changes to the forecast model except for the addition or removal of scenario specific recharge areas or pumping wells.

As recommended by SGMA guidance documents, the forecast model simulates the 50-year period from 2020 to 2069 using 50 annual stress periods. Annual stress periods were used because the majority of available historical data and forecast estimates are annualized.

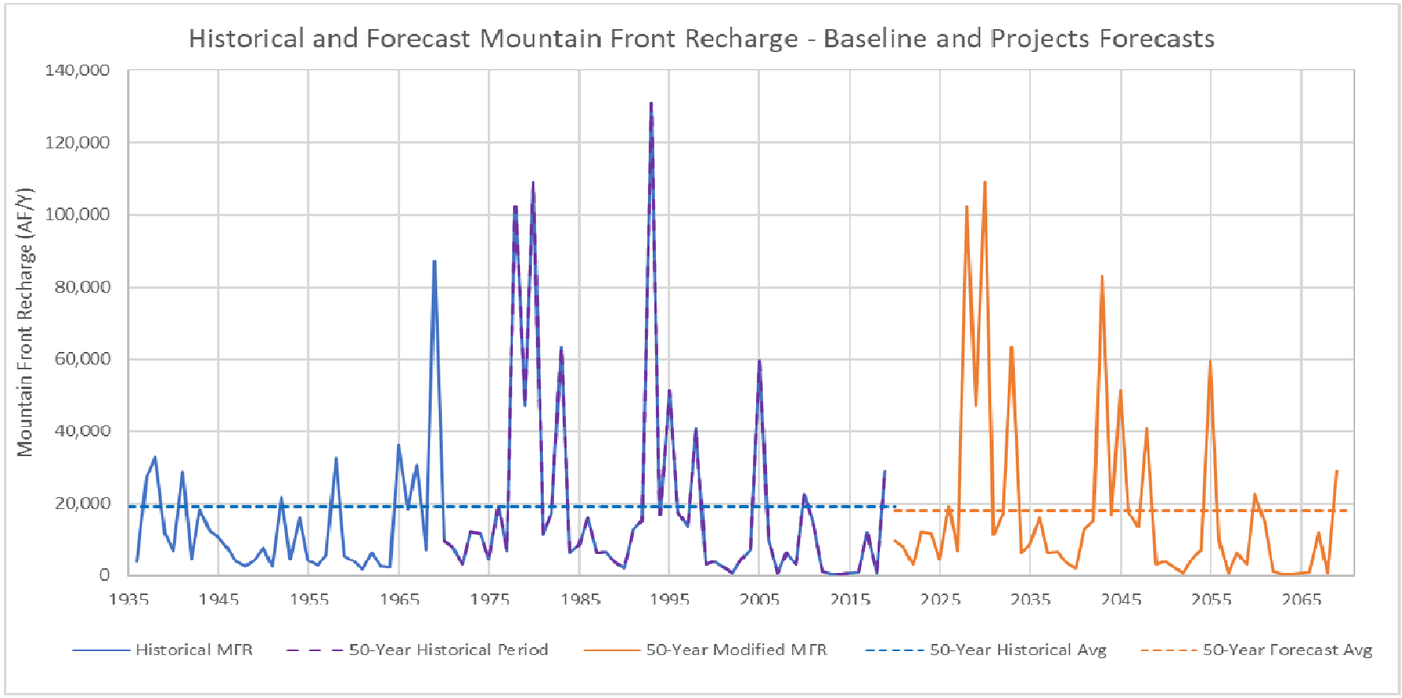
7.3.2 Mountain Front Recharge

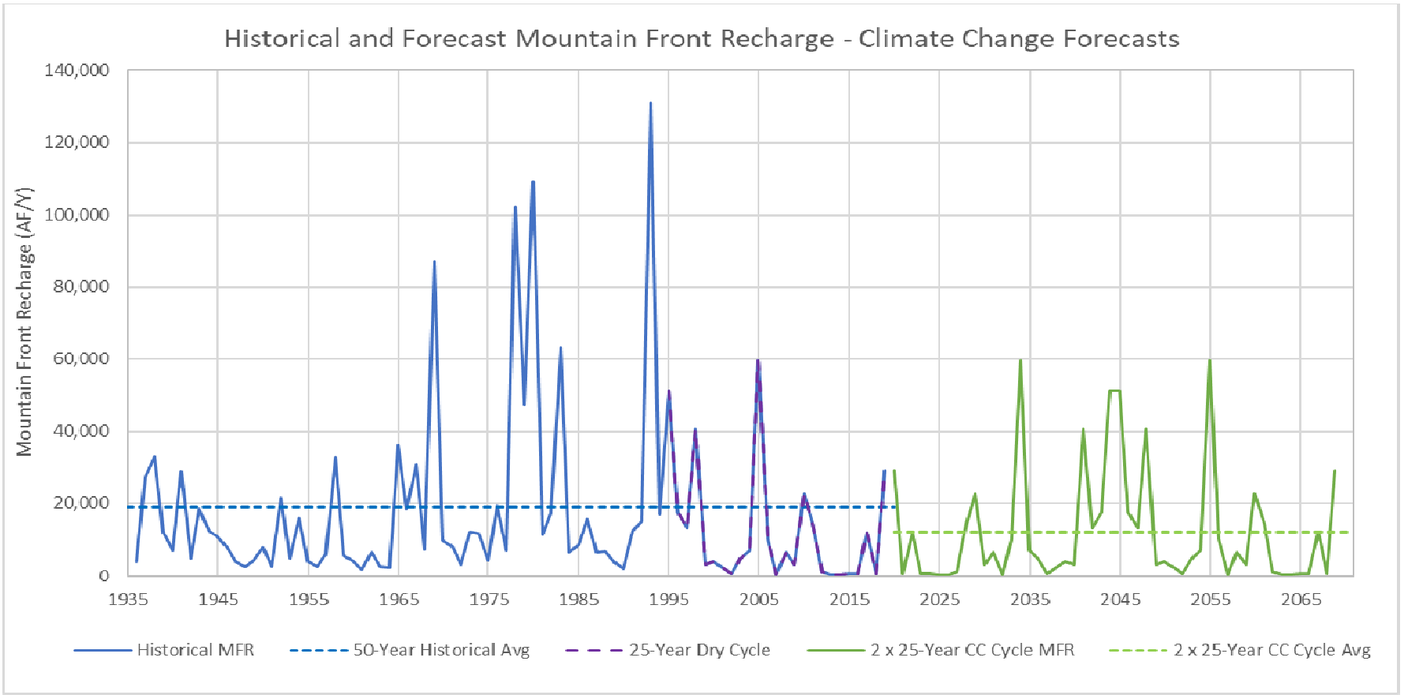
MFR within the model domain occurs from 13 watershed located in the San Bernardino and Little San Bernardino mountains (see Section 5). Between 1936 and 2019 (84 years), the period of record, MRF within the model domain ranged from 372 to 241,935 acre-feet per year (AFY) and averaged 19,145 AFY (**Figure 7-1**).

The SGMA guidance requires that forecast hydrology be based on at least 50 years of historical hydrology. All forecast scenarios utilize the historical MFR from 1970 through 2019 as the basis for MFR estimates. Note that 1993 (forecast year 2043) was an exceptionally wet year. It is unlikely that this exceptionally wet year will be repeated in the next 50 years; hence, the MFR for forecast year 2043 was decreased to bring the 50-year forecast average MFR to 21,390 AFY, closer to 19,145 AFY long-term, 84-year period of record average. Scenario-specific MFR is described for each scenario in Section 7.4.

7.3.3 State Water Project Deliveries for Aquifer Replenishment

Aquifer replenishment in the MCSB is conducted through surface water deliveries by exchanging SWP water, including Table A allocation (Table A) and other SWP water, for Colorado River Aqueduct (CRA) water. Table A amounts and Yuba River Accord Dry Year Water Purchase Program (Yuba Accord) amounts for delivery are common to each scenario and each Climate Change scenario after applying the climate change factor. The Table A amount is 194,100 AFY assuming 100% SWP delivery reliability and the Yuba Accord amount is 651 AFY, both to be proportioned between Indio Subbasin and the MCSB, as described below. As described previously, this Alternative Plan Update assumes 45% SWP reliability through the planning horizon.





Notes:
MFR = Mountain Front Recharge
CC = Climate Change

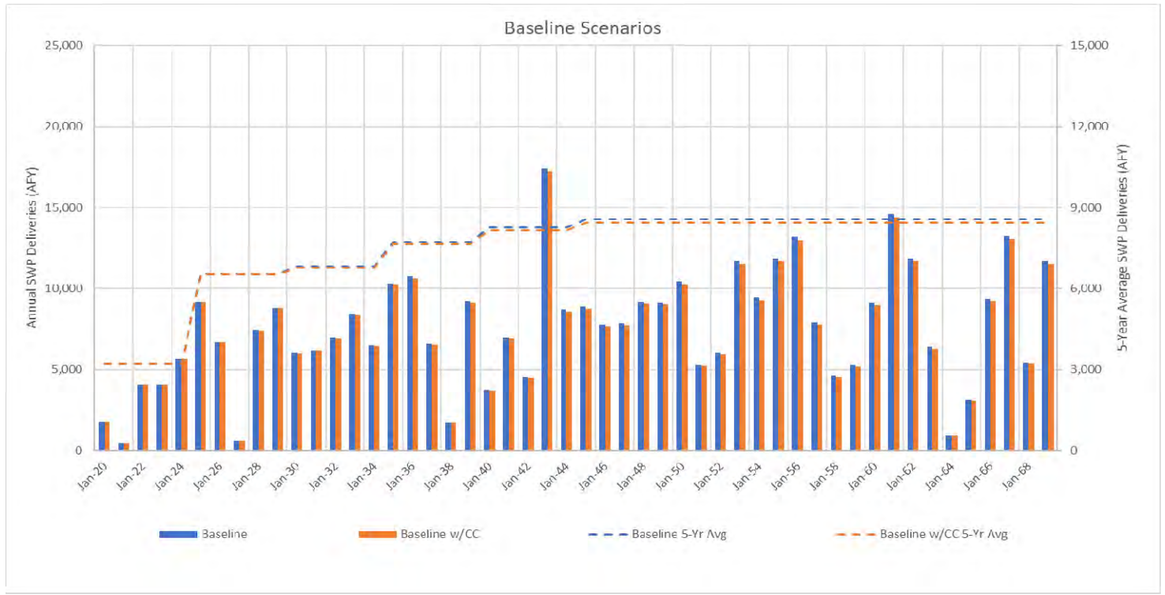
MOUNTAIN FRONT RECHARGE FORECASTS
Mission Creek Subbasin Alternative Update
Coachella Valley , California

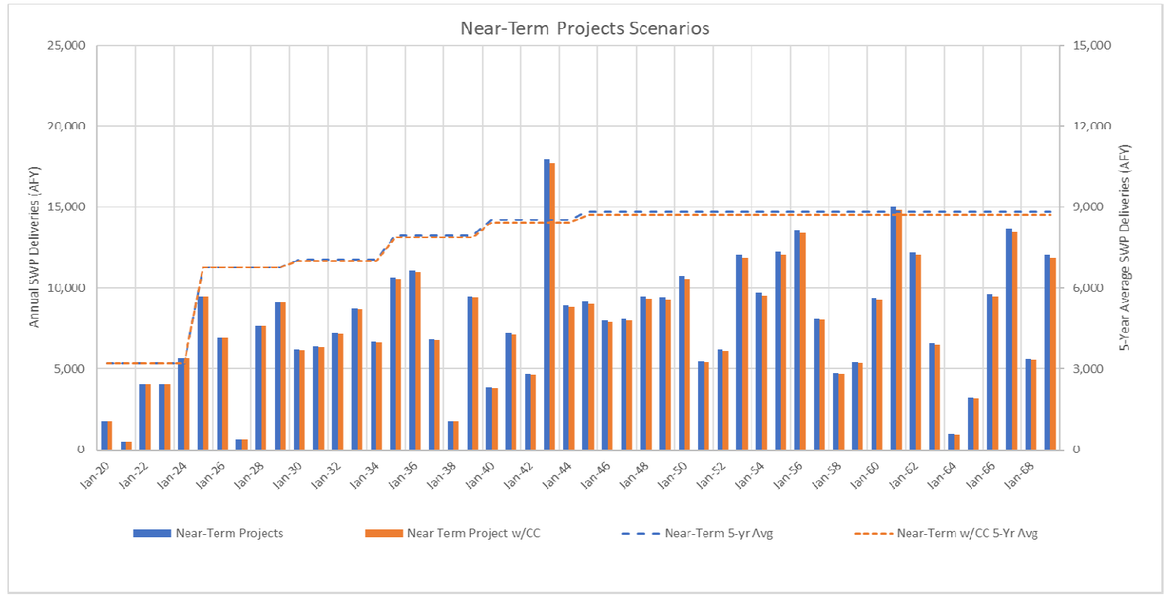
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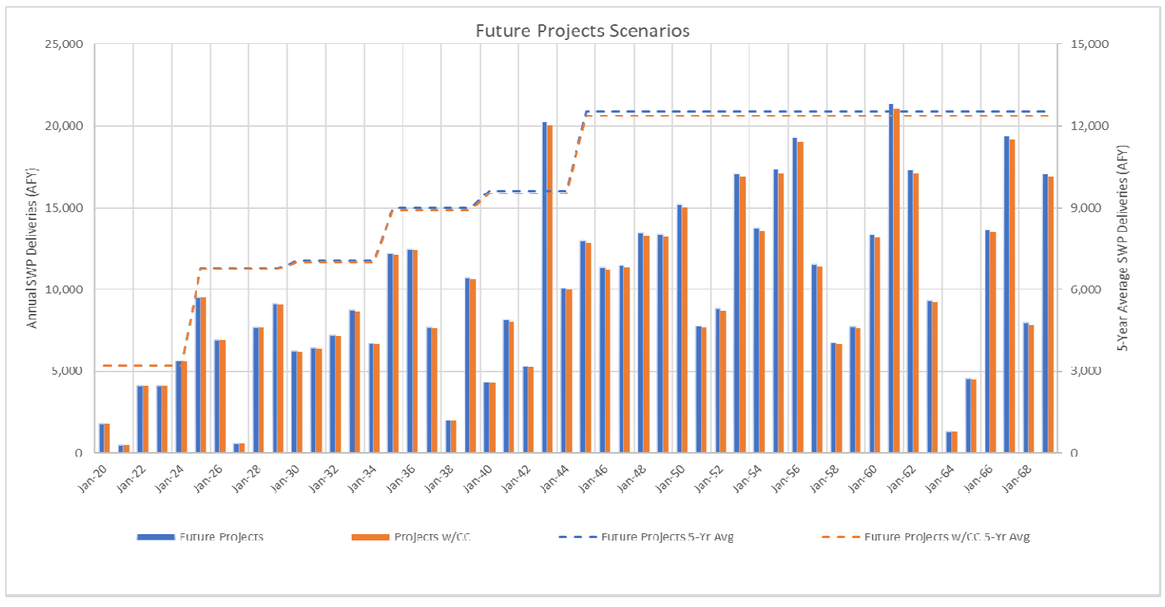
Table B4a in **Appendix B** shows the estimated Baseline SWP Table A and Yuba Accord deliveries for five-year projections starting in 2020 using the 45% delivery reliability. Supplies are then split between the two groundwater replenishment facilities in the West Whitewater River Management Area (in the Indio Subbasin) and the Mission Creek Management Area based on groundwater production in these two management areas. For 2020, the split is approximately 92% of the projected SWP water is delivered to the WWR-GRF and approximately 8% is delivered to the MC-GRF. Based on the demand projections, the percentage of recharge water delivered to the MC-GRF increases to approximately 9% in 2030 and increases again to approximately 10% in 2045. This process was used to estimate five-year projections for the MC-GRF from 2020 to 2045. Finally, the delivery is adjusting for "takes" on advance deliveries provide by Metropolitan Water District of Southern California (MWD) that are stored in the Coachella Valley and that maybe credited against future deliveries. These are referred to as Advanced Delivery Credits). The actual dates that Advanced Delivery Credits will be exercised is unknown. However, for the purpose of the model the Advanced Delivery Credit is deducted from the model from 2025 to 2035 to prevent double counting of the advanced deliveries. Similar SWP Table A five-year projections for the MC-GRF from 2020 to 2045 were developed for the Near-Term Projects scenario (**Table B4b** in **Appendix B**) and the Future Projects Scenario (**Table B4c** in **Appendix B**). Following 2045, SWP deliveries are assumed to be the same as 2045 through the end of the simulation in 2069.

The five-year projections were then annualized over the forecast period from 2020 through 2069 using a SWP factor developed for the Indio Subbasin Water Management Plan Update (Todd/W&C, 2021) to provide variability and is described in further detail in Appendix B. Application of the annual SWP factor to the five-year average delivery for each scenario, provided in **Tables B4a, B4b, and B4c** in **Appendix B,** results in a time-variant forecast of annual SWP deliveries that averages the same as the five-year projection for each scenario. **Table B5** in **Appendix B** provides the analog Table A reliability, calculated annual SWP factor, average annual delivery for the five-year period, and calculated annual SWP deliveries for each scenario. **Figure 7-2** shows a graphic of the five-year average deliveries and annual deliveries after applying the annual SWP factor.

SWP replenishment water for years 2020 through 2024 was tabulated separately based on known or reasonably estimated actual conditions and the contractual obligation to rebalance deliveries between the West Whitewater River Management Area and the Mission Creek Management Area. During the period 2000-2010, there were several years in which SWP deliveries to the MC-GRF were greater than obligations based on proportion of pumping. The MCSB Settlement Agreement required that SWP deliveries be rebalanced over a 20-year period beginning December 2004 and ending in December 2024. Currently, 8,096 acre-feet (AF) of replenishment water will need to be deducted from the MC-GRF replenishment allocation to achieve the rebalance obligation by December 2024.







Notes:
CC = Climate Change

FORECAST STATE WATER PROJECT DELIVERIES
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wood.		Figure **7-2**

Coachella Valley region, the general understanding from the Agencies and other water management agencies in the Coachella Valley is that the region could be experiencing ongoing below normal average precipitation conditions with more recurring dry years. As such, the Indio Subbasin and MCSB technical teams and management committees agreed to use the recent observed below normal precipitation condition from 1995 through 2019 as the **Climate Change** scenario for the region. The assumption for this scenario is that climatic conditions of this 25-year period in the Coachella Valley is duplicated to provide the full 50-year hydrologic period. The period was implemented in a reverse order (i.e., 2019 to 1995) for the first 25-year portion of the forecast period, then forward order (i.e., 1995- 2019) for the second 25-year portion of the period. This results in a hydrologic period that starts and ends with multiple dry years. It was also assumed that climate change will impact the reliability of SWP deliveries as described in Section 4.2.4. The Technical Addendum to the 2019 SWP Delivery Capability Report (CDWR, 2020b) provides a "Future Conditions with Climate Change and 45 cm Sea Level Rise Scenario," which projects a further decrease in SWP deliveries over time. The 2019 SWP Delivery Capability Report estimates a future delivery reliability of 58 percent (%) declining to 52% by 2040 (CDWR, 2020a). However, based on the average SWP deliveries since the 2007 Wanger Decision, this Alternative Plan Update recognizes the significant potential reduction in reliability associated with Delta export litigation and climate change, if the Delta Conveyance Facility (DCF) Project is not constructed, and therefore, assumed a SWP delivery reliability of 45% through the planning horizon for all scenarios. In addition, as modeled by CDWR in its 2019 SWP Delivery Capability Report (CDWR, 2020), climate is anticipated to result a decrease of SWP deliveries of 1.5% by 2045.

7.2.3 Summary of Modeled Scenarios for Water Management Forecasting

Each of the three water management scenarios was simulated with and without climate change assumptions. This resulted in a total of six scenarios:

1) Baseline,
2) Near-Term Projects,
3) Future Projects,
4) Baseline with Climate Change,
5) Near-Term Projects with Climate Change, and
6) Future Projects with Climate Change.

The Wood Team and the Management Committee agreed the two scenarios that involve additional projects (Near-Term Projects and Future Projects) and climate change assumptions are reasonable and conservative and should be the focus of MCSB planning. The Baseline scenario is presented with and without climate change for comparison of the impact of the climate change assumptions. Therefore, the following discussion is focused on scenarios 1, 4, 5, and 6. Scenarios 2 and 3 are described in detail in **Appendix B**. Key hydrologic assumptions

incorporated into all the scenarios are described below. Hydrologic assumptions specific to scenarios 1, 4, 5, and 6 are described in Section 7.4.

7.3 Common Assumptions

Several assumptions and hydrologic inputs are common to all the forecast scenarios. These are discussed in the following sections.

7.3.1 Model Domain and Simulation Period

The calibrated MCSB Model summarized above formed the hydrogeologic basis of the forecast model. There were no structural or hydrogeologic changes to the forecast model except for the addition or removal of scenario specific recharge areas or pumping wells.

As recommended by SGMA guidance documents, the forecast model simulates the 50-year period from 2020 to 2069 using 50 annual stress periods. Annual stress periods were used because the majority of available historical data and forecast estimates are annualized.

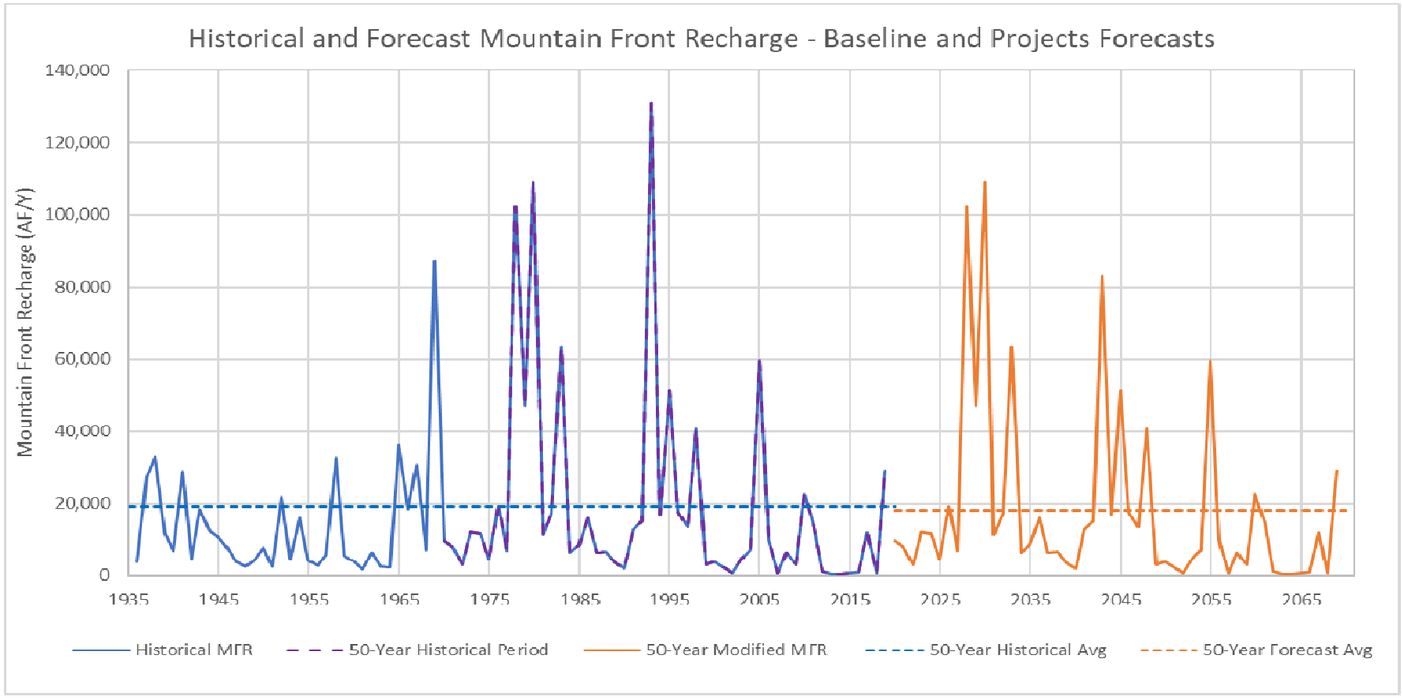
7.3.2 Mountain Front Recharge

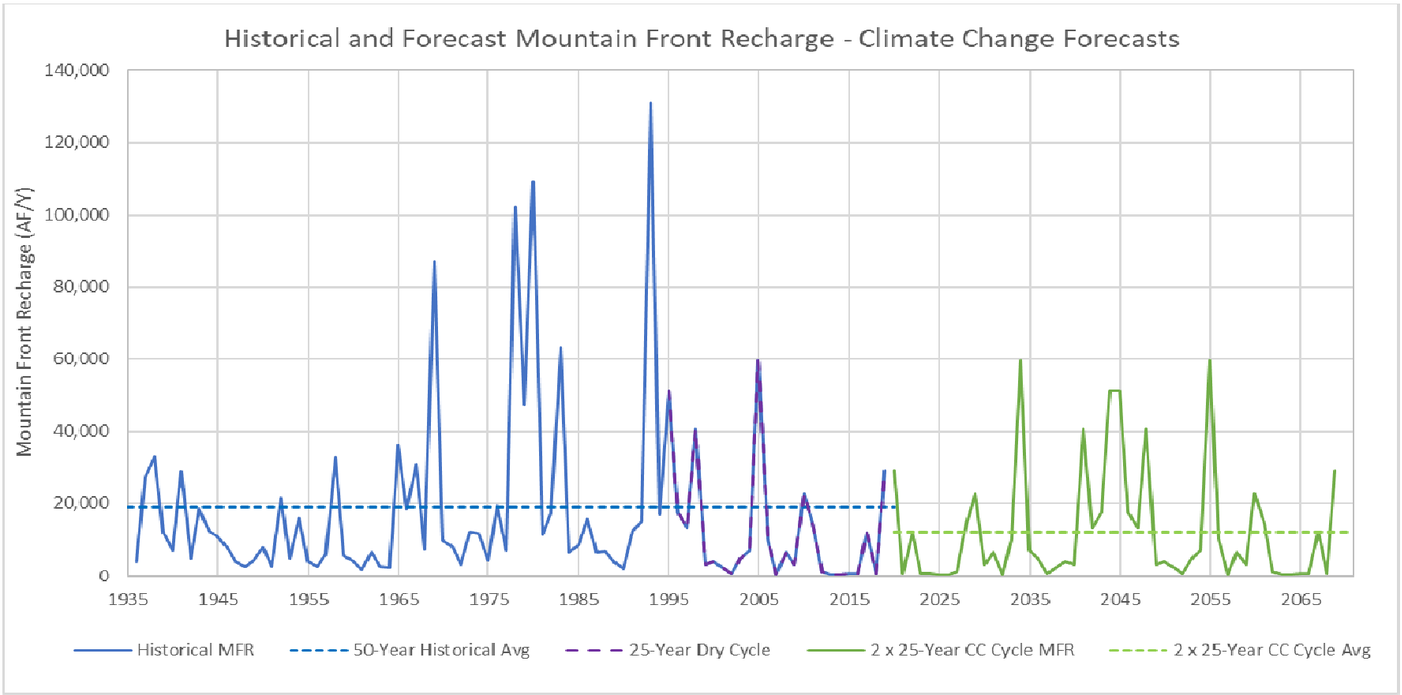
MFR within the model domain occurs from 13 watershed located in the San Bernardino and Little San Bernardino mountains (see Section 5). Between 1936 and 2019 (84 years), the period of record, MRF within the model domain ranged from 372 to 241,935 acre-feet per year (AFY) and averaged 19,145 AFY (**Figure 7-1**).

The SGMA guidance requires that forecast hydrology be based on at least 50 years of historical hydrology. All forecast scenarios utilize the historical MFR from 1970 through 2019 as the basis for MFR estimates. Note that 1993 (forecast year 2043) was an exceptionally wet year. It is unlikely that this exceptionally wet year will be repeated in the next 50 years; hence, the MFR for forecast year 2043 was decreased to bring the 50-year forecast average MFR to 21,390 AFY, closer to 19,145 AFY long-term, 84-year period of record average. Scenario-specific MFR is described for each scenario in Section 7.4.

7.3.3 State Water Project Deliveries for Aquifer Replenishment

Aquifer replenishment in the MCSB is conducted through surface water deliveries by exchanging SWP water, including Table A allocation (Table A) and other SWP water, for Colorado River Aqueduct (CRA) water. Table A amounts and Yuba River Accord Dry Year Water Purchase Program (Yuba Accord) amounts for delivery are common to each scenario and each Climate Change scenario after applying the climate change factor. The Table A amount is 194,100 AFY assuming 100% SWP delivery reliability and the Yuba Accord amount is 651 AFY, both to be proportioned between Indio Subbasin and the MCSB, as described below. As described previously, this Alternative Plan Update assumes 45% SWP reliability through the planning horizon.





Notes:
MFR = Mountain Front Recharge
CC = Climate Change

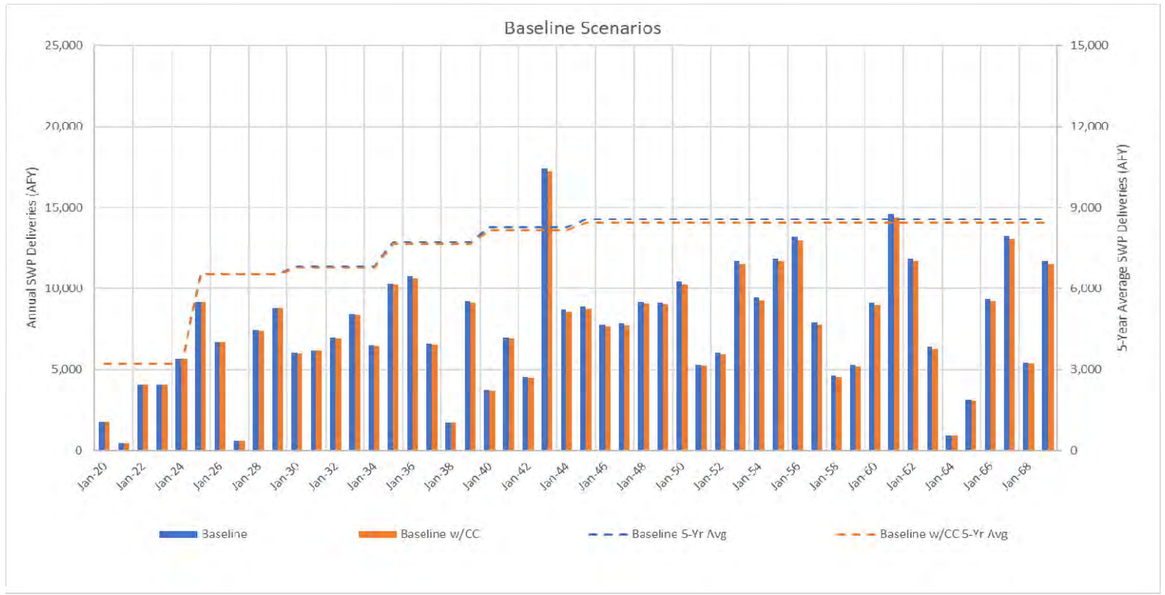
MOUNTAIN FRONT RECHARGE FORECASTS
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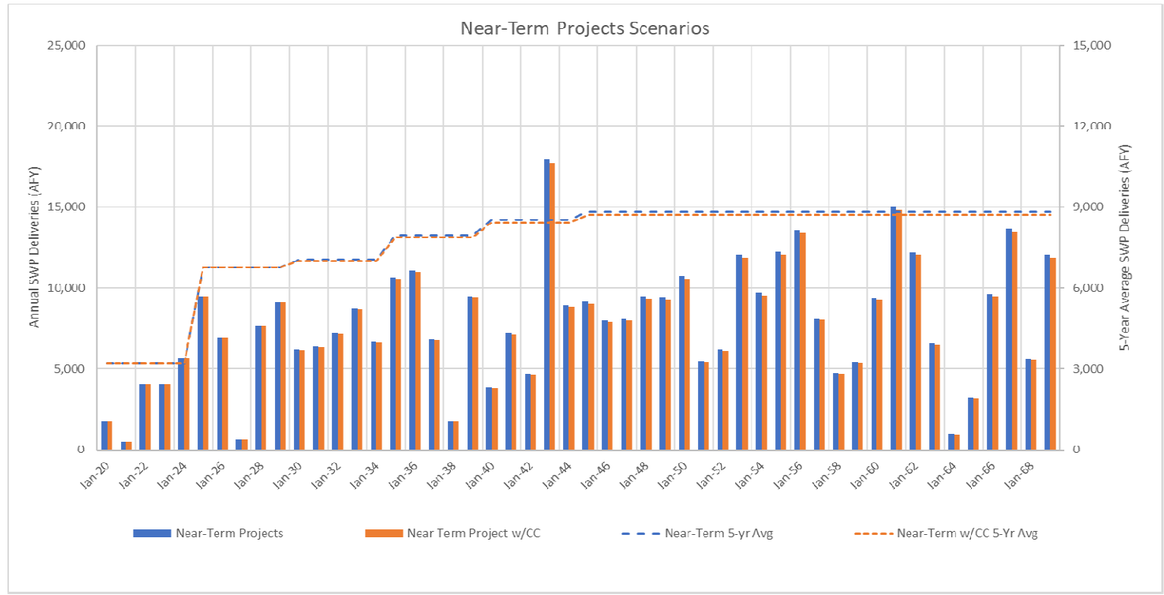
By: dmb	Date: 09/30/2021	Project No.: CM19167351
wood.		Figure **7-1**

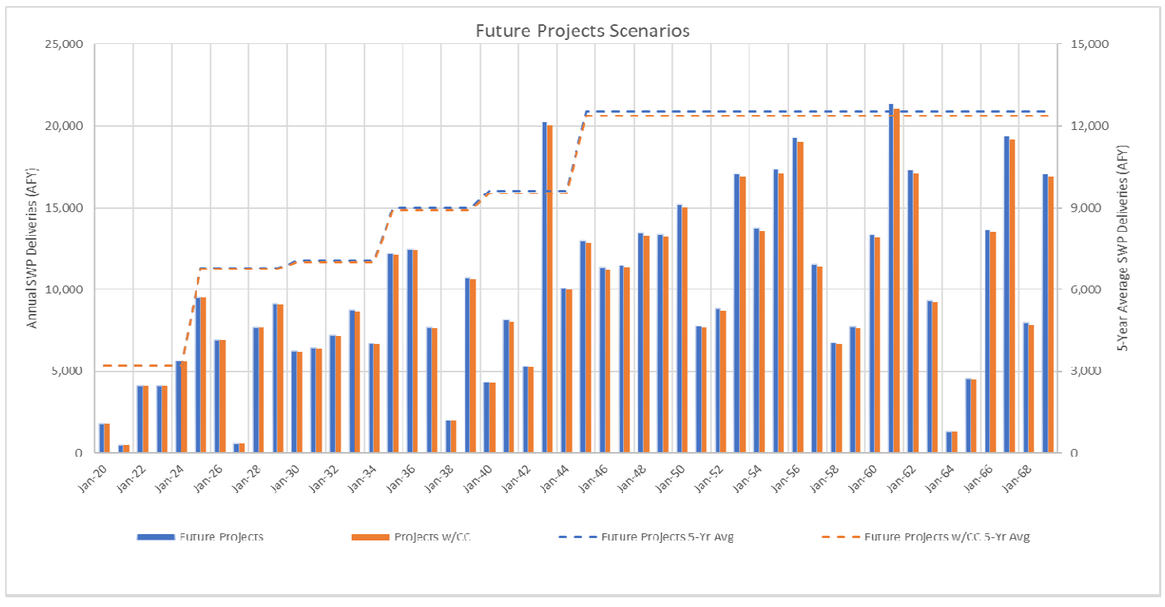
Table B4a in **Appendix B** shows the estimated Baseline SWP Table A and Yuba Accord deliveries for five-year projections starting in 2020 using the 45% delivery reliability. Supplies are then split between the two groundwater replenishment facilities in the West Whitewater River Management Area (in the Indio Subbasin) and the Mission Creek Management Area based on groundwater production in these two management areas. For 2020, the split is approximately 92% of the projected SWP water is delivered to the WWR-GRF and approximately 8% is delivered to the MC-GRF. Based on the demand projections, the percentage of recharge water delivered to the MC-GRF increases to approximately 9% in 2030 and increases again to approximately 10% in 2045. This process was used to estimate five-year projections for the MC-GRF from 2020 to 2045. Finally, the delivery is adjusting for "takes" on advance deliveries provide by Metropolitan Water District of Southern California (MWD) that are stored in the Coachella Valley and that maybe credited against future deliveries. These are referred to as Advanced Delivery Credits). The actual dates that Advanced Delivery Credits will be exercised is unknown. However, for the purpose of the model the Advanced Delivery Credit is deducted from the model from 2025 to 2035 to prevent double counting of the advanced deliveries. Similar SWP Table A five-year projections for the MC-GRF from 2020 to 2045 were developed for the Near-Term Projects scenario (**Table B4b** in **Appendix B**) and the Future Projects Scenario (**Table B4c** in **Appendix B**). Following 2045, SWP deliveries are assumed to be the same as 2045 through the end of the simulation in 2069.

The five-year projections were then annualized over the forecast period from 2020 through 2069 using a SWP factor developed for the Indio Subbasin Water Management Plan Update (Todd/W&C, 2021) to provide variability and is described in further detail in Appendix B. Application of the annual SWP factor to the five-year average delivery for each scenario, provided in **Tables B4a, B4b, and B4c** in **Appendix B,** results in a time-variant forecast of annual SWP deliveries that averages the same as the five-year projection for each scenario. **Table B5** in **Appendix B** provides the analog Table A reliability, calculated annual SWP factor, average annual delivery for the five-year period, and calculated annual SWP deliveries for each scenario. **Figure 7-2** shows a graphic of the five-year average deliveries and annual deliveries after applying the annual SWP factor.

SWP replenishment water for years 2020 through 2024 was tabulated separately based on known or reasonably estimated actual conditions and the contractual obligation to rebalance deliveries between the West Whitewater River Management Area and the Mission Creek Management Area. During the period 2000-2010, there were several years in which SWP deliveries to the MC-GRF were greater than obligations based on proportion of pumping. The MCSB Settlement Agreement required that SWP deliveries be rebalanced over a 20-year period beginning December 2004 and ending in December 2024. Currently, 8,096 acre-feet (AF) of replenishment water will need to be deducted from the MC-GRF replenishment allocation to achieve the rebalance obligation by December 2024.







Notes:
CC = Climate Change

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wood.		Figure **7-2**

During the forecast period, actual SWP deliveries in 2020 were 1,768 AF and SWP deliveries for 2021 are estimated to be only 476 AF. These values were used as known or estimated without application of the Annual SWP factor. The smaller volumes of replenishment water delivered to the MC-GRF in 2020 and 2021 were recharged and not used to reduce the surplus in the balance obligation. It was assumed that projected SWP deliveries averaging 7,143 AFY (**Table B5** in **Appendix B**) will begin in 2022 that between 2022 and 2024, a corresponding total of 21,429 AF of replenishment water will be available to the MC-GRF. An additional 233 AFY is added to this total for two years of the Lake Perris Seepage starting in 2023 (466 AF). This brings the total to 21,895 AF. It was further assumed the volume needed for rebalance will be deducted at a rate of 2,699 AF each year for 2022 through 2024 (8,096 AF total deduction). The remaining balance of approximately 13,800 AF allocated to the three years 2022, 2023 and 2024.

This process of estimating the SWP supplies for replenishment based on the five-year projections was used for 2020 through 2045. SWP deliveries for years after 2045 are assumed to be identical to those of 2045 through the end of the simulation in 2069. Additional water supply assumptions under the Near-Term Projects and Future Projects scenarios result in additional SWP Table A supplies (**Tables B4b** and **B4c** in **Appendix B**). Changes in SWP Table A supplies as a result of climate change factors were also calculated (**Tables B4a, B4b,** and **B4c** in **Appendix B**). These differences are described where applicable for each scenario in Section 7.4.

7.3.4 Population Growth and Pumping Demand

There are no surface water supplies used to meet demands within the model domain (study area). All water supplies are from pumped groundwater. Hence, population growth will result in increased pumping demand. All forecast scenarios utilize the same assumptions regarding population growth and the associated groundwater pumping demand.

7.3.4.1 Population Growth

As described in Sections 2 and 3, Planning Area demographics are based on population information from the Southern California Association of Governments' (SCAG) regional growth forecast contained in the 2020 Regional Transportation Plan and Sustainable Communities Strategy (SCAG, 2020). The forecast includes population estimates for the base year 2016 and projections for years 2020, 2035, and 2045. SCAG used the Transportation Analysis Zones (TAZ), which are similar to the Census Block Groups, in their population projections.

The projected population for each TAZ polygon within the Planning Area was analyzed using graphical information system (GIS) methods to provide population estimates for the Planning Area of approximately 53,000 in 2020, 74,000 in 2035 and 88,000 in 2045 (Section 2, **Table 2-1**). These projections were linearly interpolated to provide an annual estimate of future population in the study area from 2020 through 2045.

7.3.4.2 Groundwater Pumping Demand

Municipal pumping, which accounts for about 75% of total pumping, is directly related to population. Historically, total pumping (municipal and private) in the Planning Area has ranged from a few thousand AFY in the 1950s to almost 20,000 AFY in 2006 (**Figure 7-3, bottom left**). Based on the demand projections in Section 3 and **Appendix C**, total municipal pumping demand was estimated to increase from about 10,700 AFY in 2018 to about 16,820 AFY by 2045 (**Figure 7-3, upper left; Table B6** in **Appendix B**). The increased pumping demand was distributed to existing well fields for each municipal planning area based on the population projections by TAZ polygons (**Figure 7-3, upper right**). Production for existing wells was allowed to increase to the historical high groundwater production for each well in the Planning Area to accommodate the increase in demand. Based on historical performance, the currently existing wells could accommodate the increase in municipal demand, so no additional wells were added to the model.

Metered private well production, consisting of pumping for golf courses, agricultural (primarily fish farms), industrial, and single domestic wells, was assumed to remain at the average 2015-2019 rate of 3,504 AFY through 2039. In 2040, the CPV Sentinel Energy Project is anticipated to be complete, and an average of 295 AFY will no longer be required for this industrial use. This results in metered private production declining to 3,209 AFY in 2040 and remaining at this level through the remainder of forecast simulation period.

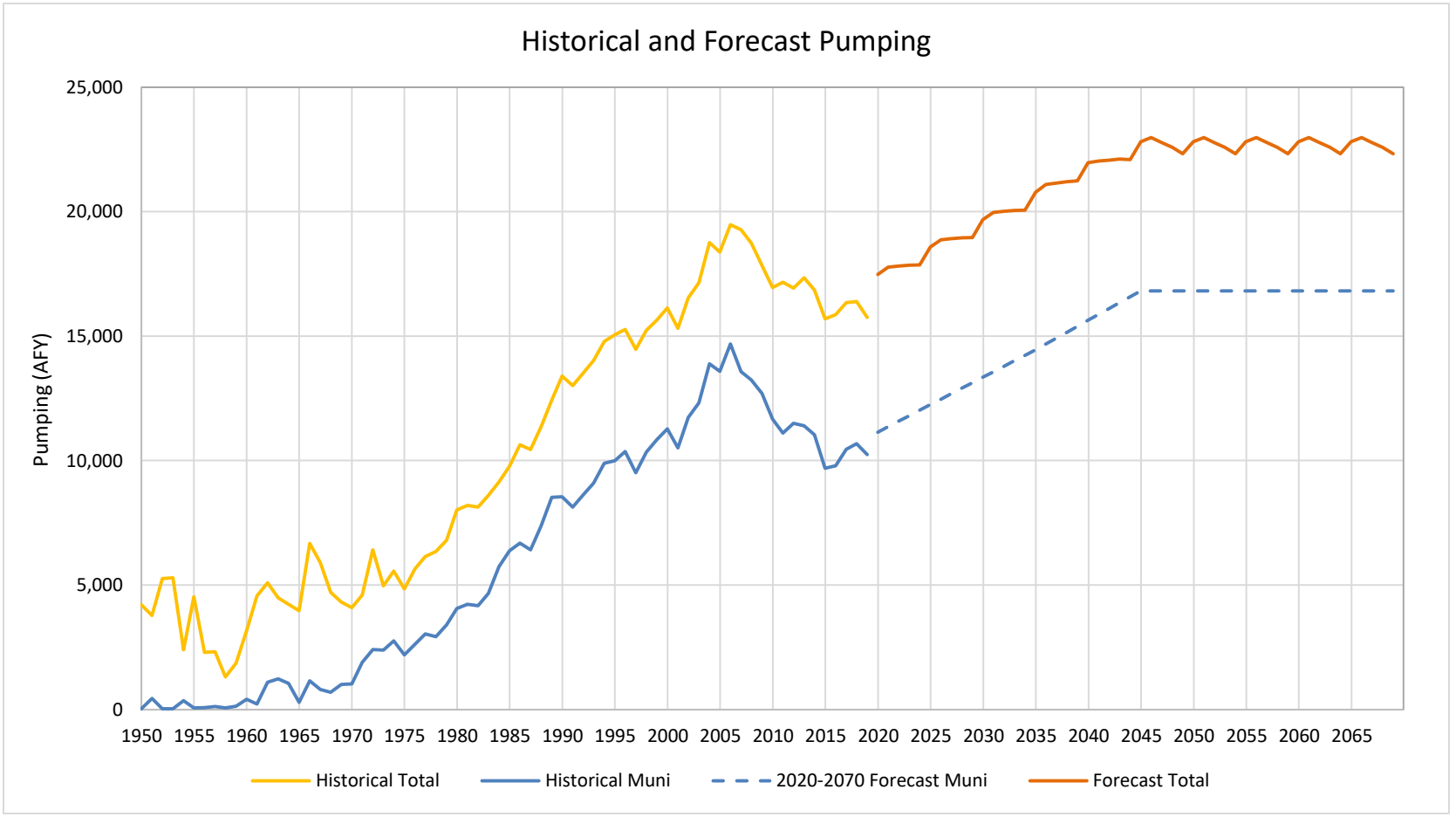
Since the SCAG projections end in 2045, it was further assumed that all pumping demand would be held constant after 2045 (**Appendix B, Table B6**). Unmetered private well pumping assumed to be used primarily to meet domestic demands was estimated to decrease from 474 AFY in 2020 to 466 AFY in 2045 due to passive conservation assumptions. However, because the unmetered pumping estimates are based on highly uncertain assumptions, this pumping was rounded up to 500 AFY through the planning horizon for modeling purposes.

This pumping demand described above is common to all forecast scenarios.

7.3.5 Return Flow Recharge

Return flow consists of the proportion of pumped groundwater that returns to the water cycle as recharge to groundwater after it has been used for its intended purpose (municipal, agricultural, industrial, or golf course). The assumptions for the return flow calculations for the forecast model are the same as those used in the calibration model (**Table B7** in **Appendix B**) and are based on return flows estimated for the Coachella Valley Groundwater Basin as documented by K&SEC and Stantec (2018).

\\IRV-FS1\Share\CM19167351 (CVWD Alt update)\4.2 Forecast\Appendix_B_Forecast_Figures_v6_10-05-21Fig_7-3 GW Demand 10/18/2021



Note:
Pumping records compiled from various sources including Fogg, 2000, PSOMAS, 2010, and Agency records
Muni = municipal pumping

GROUNDWATER DEMAND
Mission Creek Subbasin Groundwater Model Update
Riverside County, California

By: dmb	Date: 10/18/2021	Project No.: CM19167351
wood.		Figure 7-3

7.3.5.1 Applied Water Return Flow

Applied water return flow includes return flow from municipal and private outdoor use of pumped groundwater including agricultural, industrial, and golf course irrigation. Because private metered production remains the same for the forecast period, the return flow for this use remains the same. Return flow for municipal outdoor use increases with increasing production through the planning horizon. Return flows for the Baseline scenario are provided in **Table B7** in **Appendix B**. Return flow from applied water has been estimated to be approximately 25%. Because applied water use is the same for all scenarios, applied water return flows are the same for all scenarios

7.3.5.2 Septic and Treated Wastewater Return Flows

MSWD plans to continue to convert areas currently on septic systems to the municipal sewer system. The location of the areas to be converted (A, D3, M2, etc.) are shown on **Figure 7-4**. An estimated 2,331 parcels will be converted in the MCSB and DHSSB from 2022 to 2035 (**Figure 7-5**). The top chart on **Figure 7-5** depicts the timeline of the conversion of septic systems to municipal sewer connections for the conversion areas. The lower chart on **Figure 7-5** shows the decrease in septic system flows as systems are converted and the increase in sewer system flows as septic systems are converted, and as undeveloped parcels are developed over the build-out period. Septic to sewer conversions are incorporated into the Baseline return flow provided in **Table B7** of **Appendix B**. Total forecast return flows were calculated for each subbasin/subarea and are forecast to increase gradually from about 7,000 AFY to about 10,800 AFY by 2045 as a result of population growth. Forecast return flow volumes are the same for each scenario. However, the disposal locations for the treated wastewater differ between the Baseline, the Near-Term with Climate Change and Future Project with Climate Change scenarios, as discussed under each scenario. Additional information on return flows is provided in **Appendix B**.

7.3.6 Garnet Hill Fault Flux and Whitewater River Recharge

As discussed in **Appendix B**, Section B.1.1, Wood adopted the hydraulic properties from the 1997-2019 Indio Subbasin model into the MCSB Calibration model in the GHSA, where the models overlap. Wood also incorporated the simulated underflow between the GHSA and main Indio Subbasin across the Garnet Hill Fault and Whitewater River recharge into the into the GHSA portion of the MCSB Model. The processes for extracting the Garnet Hill Fault flux and Whitewater River recharge from the Indio Subbasin model and importing them into the MCSB Calibration model are discussed more fully in **Appendix A**, Section A.4.5.8.

As discussed in The Indio Subbasin Water Management Plan Update (Todd/W&C, 2021), the Indio Subbasin model was also used to perform multiple forecast scenarios, including scenarios similar to the six scenarios listed above in Section 7.2. Using the same processes as described in **Appendix A**, the Garnet Hill Fault flux and Whitewater River recharge were extracted from the Indio Subbasin model for each of the six forecast scenarios and incorporated into the MCSB forecast scenarios (**Figure B12** in **Appendix B**). This resulted in a consistent treatment of Whitewater River recharge and Garnet Hill Fault flux between the two models for all forecast scenarios. Although the Garnet Hill Fault flux varies between the scenarios, it has little influence on the MCSB and therefore is not discussed in this section. For a discussion of the Garnet Hill Fault flux for each scenario refer to **Appendix B**.

San Bernardino County

Riverside County

Mission Creek

Mission Creek Groundwater Replenishment Facility

an Bernardino Mountains

Little San Bernardino Mountains

Mission Creek Subbasin

Whitewater River

Bonnie Bell

Proposed Percholation/ Recharge Location for Regional Wastewater Reclamation Facility

Horton Wastewater Treatment Plant

Proposed Regional Wastewater Reclamation Facility

Garnet Hill Subarea

Desert Hot Springs Subbasin

Desert Crest Wastewater Treatment Plant

Indio Hills

Whitewater River Groundwater Replenishment Facility

A

D-3

G

H

I

J-2

K

M2

62

10

111

Explanation

- Wastewater Treatment and Reclamation facility
- A — Septic to sewer conversion area
- Groundwater Replenishment Facility
- Planning Area
- Approximate Active Model Boundary
- Streams
- Highway/road
- Mission Creek Subbasin fringe area
- Garnet Hill Subarea of Indio Subbasin
- Low permeability/non-water bearing sediments/bedrock
- Desert Hot Springs Subbasin
- Indio Subbasin
- Mission Creek Subbasin

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Feet

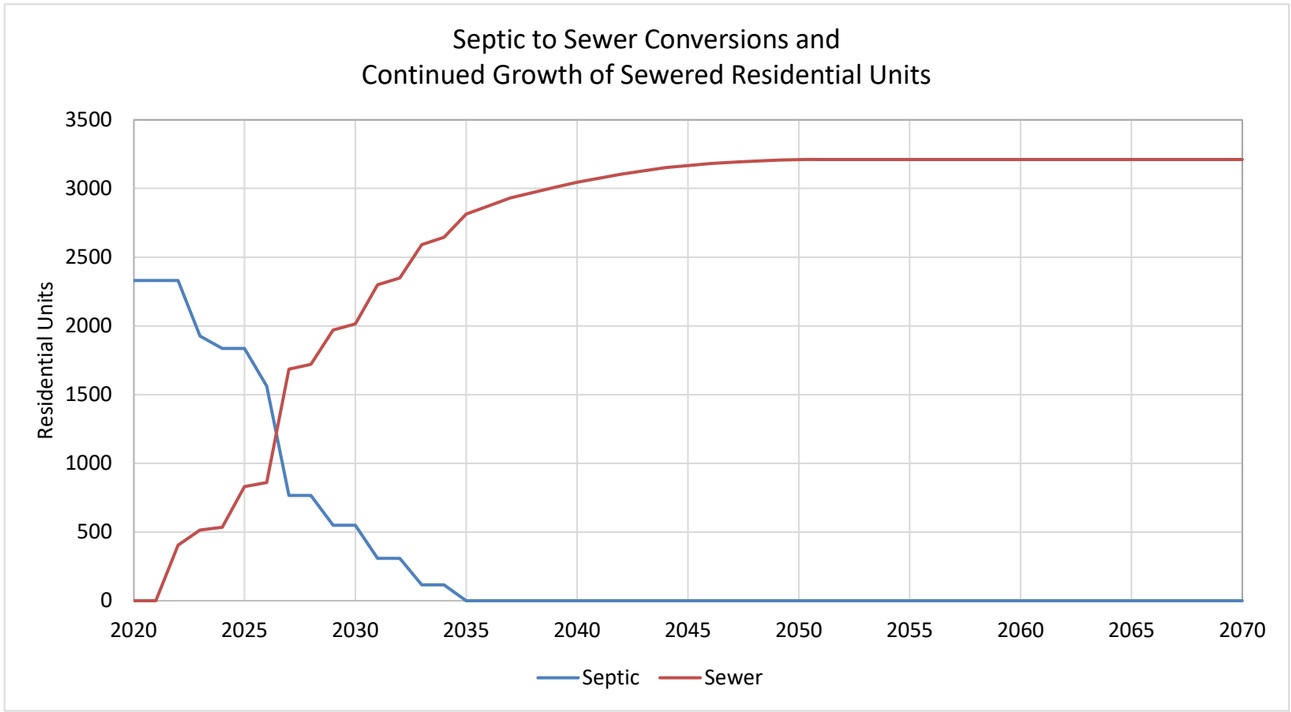
Basemap modified from aerial photograph provided by Esri, dated November 9, 2016. GSA areas from SGMA. Water.CA.gov.

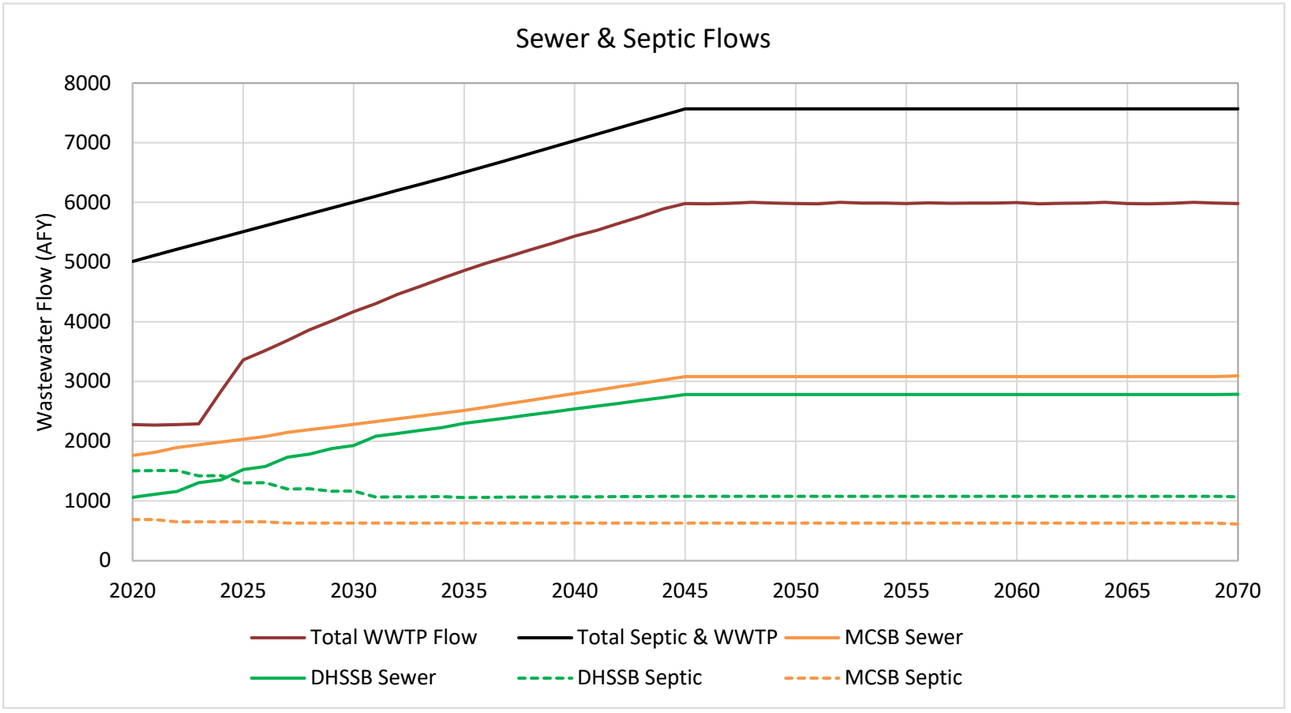
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WASTEWATER TREATMENT AND RECLAMATION FACILITIES AND SEPTIC TO SEWER CONVERSION AREAS
Mission Creek Subbasin Alternative Update
Coachella Valley, California

By: jrw/pah	Date: 9/22/2021	Project No.: CM19167351
wood.		Figure 7-4

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PROJECTED SEPTIC TO SEWER CONVERSIONS
AND SEWER AND SEPTIC FLOWS
Mission Creek Groundwater Model Update
Riverside County, California

By: dmb	Date: 10/18/2021	Project No.: CM19167351
wood.		Figure **7-5**

7.4 Scenario Assumptions

The following sections discuss the specific assumptions unique to each of the forecast scenarios.

7.4.1 Scenario 1 – Baseline Scenario Assumptions

The Baseline scenario assumptions are discussed below.

7.4.1.1 Mountain Front Recharge

Estimated MFR for the Baseline scenario was assumed to be a repeat of the MFR estimated for the calibration model for the period 1970 through 2019 (**Figure 7-1, top; Table B3** in **Appendix B**). This 50-year period includes several drought intervals, several wet intervals, and is about 3,000 AFY greater than the long-term average hydrology. As described above in Section 7.3.2, the MFR for forecast year 2043 was decreased to 28.3% of historical (1993) MFR to bring the 50-year forecast average MFR close to the long-term average of 19,145 AFY (**Figure 7-1, bottom; Table B3** in **Appendix B**).

7.4.1.2 State Water Project Deliveries for Groundwater Replenishment

SWP deliveries for groundwater replenishment under the Baseline scenario are listed in **Table B4a** of **Appendix B**. Under the Baseline scenario, SWP deliveries are forecast to range from 6,540 to 8,565 AFY and average about 6,510 AFY from 2020 through 2044 and 8,565 AFY from 2045 through 2069 (**Figure 7-2**).

7.4.1.3 Wastewater Treatment Plant and Regional Water Reclamation Facility Return Flow

Figure 7-4 shows the location of the existing Horton and Desert Crest wastewater treatment plants (WWTPs), the proposed RWRF, and the proposed RWRF recharge location. **Figure B10** of **Appendix B**, top plot**,** shows MSWD projected total wastewater flows and flows to the individual WWTP/RWRF. This estimate closely matches the estimate of wastewater effluent based on the municipal sewered indoor use (**Table B7, Figure B10**, bottom plot in **Appendix B**). For purpose of modeling, indoor water use was used to estimate wastewater effluent to maintain the overall water balance of the model. All wastewater effluent has a 3% evaporation loss applied to calculate the return flow (See **Appendix A**). A summary of the WWTP/RWRF return flows assumptions are provided below.

- Desert Crest WWTP – Desert Crest WWTP will continue to operate at capacity levels, using the observed return flows from 2015-2019 (ranging from approximately 40.5 to 51 AFY) on a recuring cycle through the planning horizon (**Table B7**, Zone 35 in **Appendix B**). This return flow is the same for all scenarios.
- Horton WWTP – Horton WWTP will continue to operate at capacity until 2023 when the RWRF comes online. A portion of the Horton WWTP will be diverted to the RWRF beginning in 2023. Sewer flow to the Horton WWTP will then increase until it returns to its operating capacity of about 2,500 AFY in 2035 (**Table B7**, Zone 13 in **Appendix B**).
- RWRF – The RWRF comes online in 2023. A portion of the Horton WWTP is diverted to the facility for startup through 2027 and then the RWRF wastewater grows with population growth and septic to sewer conversions in the Planning Area (**Table B7**, Zone 44 in **Appendix B**). For the Baseline Scenario, all the wastewater treated at the

RWRF is percolated in ponds at the RWRF in the GHSA. The volume of this water in 2023 is approximately 330 AF and grows to approximately 3,250 AF by the end of the planning horizon in 2045. The wastewater percolation remains constant from 2045 through the simulation period ending in 2069 because assumed population growth and water demand are held constant.

7.4.2 Scenario 4 – Baseline with Climate Change Assumption

The Baseline with Climate Change scenario assumptions are identical to the Scenario 1, Baseline scenario assumptions discussed in Section 7.4.1 with differences discussed below.

7.4.2.1 Mountain Front Recharge

MFR for the Climate Change scenario utilizes a 25-year drought cycle based on data from 1995 through 2019 (**Figure 7-1**, bottom chart; **Table B8** in **Appendix B**). For the 50-year forecast period, this cycle was first simulated in reverse order (2019 to 1995) and then repeated in forward order (1995 to 2019). This resulted in four notably dry periods: the first occurring between 2023 and 2027, the second between 2035 and 2040, the third between 2049 and 2054, and the fourth between 2062 and 2066 (**Figure 7-1**, bottom chart). The resulting Climate Change scenario has a significantly lower average annual MFR of 12,740 AFY (**Table B8** in **Appendix B**) compared to 21,390 AFY for the Baseline scenario (**Table B3** in **Appendix B**). This dry cycle forecast of MFR more closely represents the recent historical conditions in the Coachella Valley and is more conservative than the CDWR climate change forecast. The Agencies considered the dry cycle MFR as the most appropriate scenario to use for planning purposes. This change in MFR is the same for all Climate Change scenarios.

7.4.2.2 State Water Project Deliveries for Groundwater Replenishment

As described in Section 7.3.3, the five-year estimates of SWP deliveries (**Table B4a** in **Appendix B**) were annualized using the annual SWP delivery reliability factors for the forecast period analog years of 1970 through 2019 (**Table B5** in **Appendix B**). SWP deliveries for the Baseline with Climate Change scenario were based on the annual SWP delivery reliability factors and an added climate change factor based on CDWR modeling (CDWR climate change factor). Under anticipated climate conditions, reliability is assumed to be reduced by an additional 1.5% as compared to Baseline by 2045, as modeled by CDWR in its 2019 SWP Delivery Capability Report (CDWR, 2020). The CDWR climate change factor is applied to each five-year delivery period starting at 0.3% in 2025 and increasing by 0.3% each year until 2045 when the CDWR climate change factor is 1.5% (**Table B4a** in **Appendix B**). The climate change scenarios average deliveries from **Table B4a** in **Appendix B** are used to calculate annual deliveries for these scenarios in **Table B5** in **Appendix B.** Consequently, CDWR climate change factors are incorporated into the annual delivery for the climate change scenario in **Table B5** in **Appendix B**. These deliveries are shown graphically on **Figure 7-2**.

7.4.3 Scenario 5 – Near-Term Projects with Climate Change Assumptions

The Near-Term Projects with Climate Change scenario assumptions are identical to those described in Section 7.4.4 for Scenario 4, Baseline with Climate Change, with differences as discussed below.

7.4.3.1 Additional State Water Project Supply

The Near-Term Projects with Climate Change scenario includes the Lake Perris Seepage supply beginning in 2023. The details of this project are provided in Section 4.2.6. This Lake Perris project is assumed to provide additional SWP water for groundwater replenishment at the MC-GRF with volumes estimated at 233 AFY starting in 2023, increasing to 242 AFY in 2030, and ultimately increasing to 265 AFY in 2045 and beyond (**Table B4b** in **Appendix B**).

7.4.3.2 Regional Water Reclamation Facility Return Flow Location

The RWRF is planned to begin construction before the end of 2021 and will be constructed in the GHSA (**Figure 7-4**). The RWRF will initially discharge treated water into evaporation/percolation ponds located at the facility and the Baseline Scenario maintains that condition though the simulation period. Under the Near-Term Projects with Climate Change scenario, it is assumed that the RWRF discharge will be transported via pipeline to the MCSB for percolation and/or groundwater recharge into new ponds at the RWRF disposal/recharge location (**Figure 7-4**). Intentional recharge of the treated effluent to replenish groundwater would involve different permitting and regulatory approval steps than would disposal of the treated effluent in evaporation/percolation ponds. From a water balance standpoint, however, this project will result in an increase in return flow to the MCSB regardless of whether the treated effluent is considered to be disposed of by percolation and evaporation or used for groundwater recharge. The proposed treated water pipeline and evaporation/percolation ponds are in the design phase and are scheduled to be completed by 2028. Hence it is assumed that under the Near-Term Project scenario, the discharge from the RWRF will shift to the MCSB in 2028.

7.4.4 Scenario 6 – Future Projects with Climate Change Scenario Assumptions

The Future Projects with Climate Change scenario assumptions are identical to those described in Section 7.4.3 for Scenario 5, Near-Term Projects with Climate Change, with the differences discussed below.

The Future Projects with Climate Change scenario includes the Sites Reservoir project and the Delta Conveyance Facility project. The details of these two projects are provided in Section 4.2. For the purposes of the model forecast, these two projects increase the SWP deliveries to the MC-GRF for groundwater replenishment. The Sites Reservoir project increases SWP deliveries starting in 2035 by approximately 1,050 AFY. In 2045, the increase in deliveries becomes approximately 1,120 AFY (**Table B4c** in **Appendix B**). The Delta Conveyance project increases SWP deliveries in 2042 by approximately 2,380 AFY.

7.5 Scenario Simulation Results

Forecast scenario groundwater elevations and water balances for the MCSB are discussed in the following sections.

7.5.1 Simulated Groundwater Levels

Hydrographs of observed 2009-2019 groundwater elevations and 2020-2069 forecast groundwater elevations were prepared for the nine Key Wells in the MCSB (**Figure 7-6** and **Appendix B, Attachment B1**). Because the calibration model does not exactly match physical water levels and the forecast starts at the end of the calibration model, the forecast water levels were modified as needed to match measured groundwater levels in the wells at the end of the calibration period (the end of 2019). Each hydrograph shows the Measurable Objective based on 2009 groundwater levels and the Minimum Threshold described in Section 6 of the Alternative Plan Update.

Simulated groundwater elevations are shown for the Baseline scenario and Baseline with Climate Change scenario (**Figure 7-6**). Also shown are hydrographs for the Near-Term Projects with Climate Change and Future Projects with Climate Change scenarios.

The hydrographs show that under Baseline conditions, groundwater levels in all the Key Wells fall below their Measurable Objectives. By the end of the planning horizon (2045), groundwater levels in five Key Wells fall below their Minimum Thresholds; these include wells 02S04E36K01 (36K01), 3S4E11L04 (11L04), 03S04E12C01 (12C01), 03S05E15R01 (15R01), and 03S05E17J01 (17J01). Groundwater levels in the remaining Key Wells stay above their Minimum Thresholds through the planning horizon of 2045.

Under the Baseline with Climate Change scenario, groundwater levels in all Key Wells fall below their Measurable Objectives during the planning horizon. Six of the Key Wells also fall below their Minimum Thresholds during the planning horizon (36K01, 11L04, 03S04E04P01 [4P01], 12C01, 15R01, and 17J01).

The hydrographs show that under the Near-Term Projects scenario, all the Key Wells stay above their Measurable Objectives through the forecast period. Under the Near-Term Projects with Climate Change scenario, all but three Key Wells (4P01, 15R01, and 17J01) also stay above their respective Measurable Objectives. All Key Wells stay above their Minimum Thresholds.

The hydrographs show that under the Future Projects scenario, all the Key Wells stay above their Measurable Objectives. Under the Future Projects with Climate Change scenario, the hydrographs show that all but three Key Wells (4P01, 15R01, and 17J01) will stay above their Measurable Objectives. Well 4P01 falls below its Measurable Objective in 2029 by 3.1 feet and then recovers above the Measurable Objective in 2041. Two wells that fall below their Measurable Objective (15R01 and 17J01) are in the southern part of the MCSB and only fall below their Measurable Objectives by 1.6 feet and 0.4 feet, respectively. Wells 4P01 and 15R01 have limited historical records and the Measurable Objectives for these wells are considered provisional (see Section 6.3.2). All wells remain above their Minimum Thresholds through the planning horizon.

The forecast hydrographs indicate that the Baseline scenario is not sustainable under normal nor climate change conditions. The Baseline scenarios are only shown for comparison purposes and are not a scenario that is planned for implementation. The Near-Term Projects and Future Projects are necessary to maintain groundwater elevations in the MCSB under climate change conditions.

7.5.2 Simulated Water Balance and Change in Storage

The simulated water balances and changes in storage for scenarios Baseline, Baseline with Climate Change, Near-Term Projects with Climate Change, and Future Projects with Climate Change for the MCSB are presented below. Simulated water balances and changes in storage for GHSA and DHSSB are described in **Appendix B**.

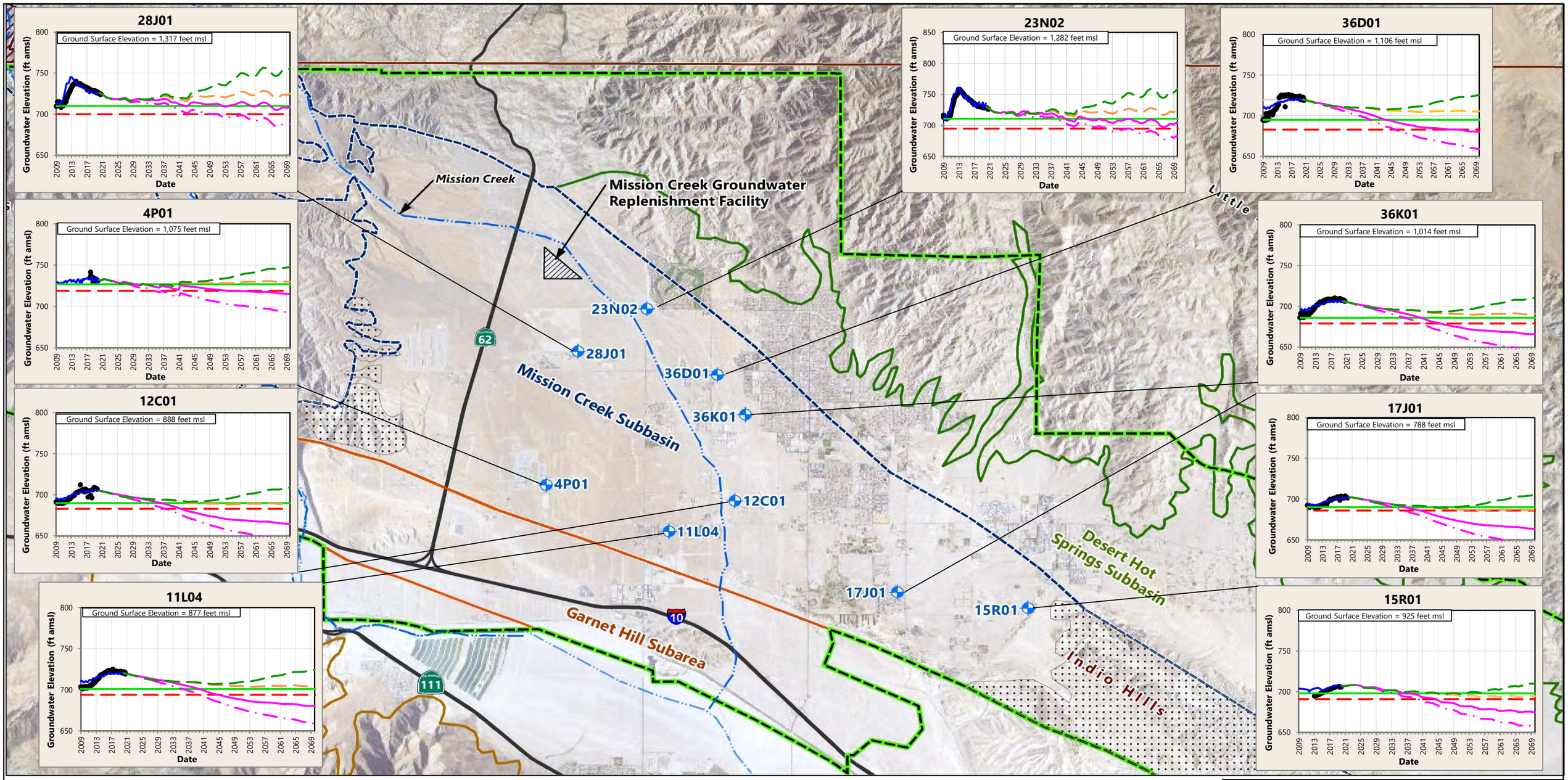
Water balance and change in storage simulated by the calibrated groundwater model includes storage for the entire subbasin/subarea. These areas are larger than the area developed for water supply and monitored by the Agencies. For example, in the MCSB, the northwestern portion of the subbasin comprises a relatively remote area without monitoring wells. This area is also where nearly all MFR into the subbasin occurs. Under extended drought conditions, MFR will decline along with groundwater levels in all subbasins. The reverse is true under wet conditions. This is part of the natural hydrogeologic cycle of the subbasin. Because this northwestern area is more than a mile upgradient from the nearest monitored area, there will be a significant time lag for the decrease or increase in recharge to impact groundwater levels in monitoring wells. Consequently, the simulated water balance and change in storage will not directly reflect groundwater levels in some portions of the MCSB under some hydrologic conditions. As described in Section 6.4.3, the Measurable Objective for groundwater in storage is based on 2009 groundwater conditions. Hence, the cumulative change in storage discussed below, which is relative to the 2009 conditions, is a useful measure in evaluating long term trends for groundwater storage and water balance.

The water balance (**Figure 7-7**and **Table B9** in **Appendix B**) shows that the long-term cumulative change in storage under the Baseline scenario is positive at 85,820 AF in 2045. Under the Baseline with Climate Change scenario, the cumulative change in storage becomes negative in the mid-2020s, decreasing to about -65,780 AF in 2040 and then rising to about -9,910 AF in 2045 (**Figure 7-8** and **Table B10** in **Appendix B**).

Under the Near-Term Projects with Climate Change scenario, the cumulative change in storage becomes negative in the mid-2020s, then rises to about 30,870 AF in 2045. Initiation of percolation of the RWRF treated wastewater in the MCSB in 2028 reduces the impacts of drought conditions through increased recharge from wastewater return flow (**Figure 7-9** and **Table B12** in **Appendix B**).

Under the Future Projects with Climate Change scenario, the cumulative change in storage becomes negative in the mid-2020s and increases to about 44,910 AF in 2045. Cumulative change in storage continues to increase as the RWRF discharge increases and more SWP water resulting from projects such as DCF and Sites is recharged at the MC-GRF (**Figure 7-10** and **Table B14** in **Appendix B**).

K:\CM19167351 (CVWD Alt update)\Final Report Figure\00 Appendix B\Appendix_B_Forecast_Figures_v30_02-11-22 Figure ES7, ES8, 7-6, 7-11, B13, and B32 v2



- Monitoring well (Key Well)
- Groundwater Replenishment Facility
- Planning Area
- Streams
- Highway/road
- Garnet Hill Subarea of Indio Subbasin
- Lower permeability/non-water bearing sediments/bedrock
- Desert Hot Springs Subbasin
- Indio Subbasin
- Mission Creek Subbasin
- Observed
- Measurable Objective
- Baseline
- Near-term Projects w/CC
- Simulated
- Minimum Threshold
- Baseline w/CC
- Future Projects w/CC

Note:
Ground surface elevation in feet above mean sea level.

0 4,000 8,000
Approximate Scale n Feet

Basemap modified from aerial photograph provided by Esri, dated November 9, 2016. GSA areas from SGMA.water.CA.gov.

N

FORECAST SIMULATION RESULTS FOR
KEY WELLS WITH MEASURABLE OBJECTIVES
AND MINIMUM THRESHOLDS
Mission Creek Subbasin Alternative Update
Coachella Valley, California

By: grr/pah	Date: 03/09/2022	Project No.: CM19167351
wood.		Figure 7-6

A direct comparison of the simulated MCSB cumulative change in storage curves for the Baseline scenario and the Baseline, Near-Term Projects, and Future Projects with Climate Change scenarios shows that positive and negative cumulative changes in storage occur over time. This is primarily driven by variations in assumed regional mountain front recharge. Under the assumed Baseline hydrology conditions, the MCSB starts out with a negative cumulative change in storage from 2022 through 2027, and then has a net positive cumulative change in storage from 2028 through 2069. This indicates that no additional management actions would be necessary to maintain groundwater storage sustainability (**Figure 7-11**). However, under the assumed drier climate change hydrology conditions, the Baseline with Climate Change scenario has a long-term negative cumulative change in storage starting in 2025 and is therefore not sustainable. The Near-Term Projects and Future Projects with Climate Change scenarios also start out with negative cumulative changes in storage but begin a positive trend in the early 2040s and the cumulative change in storage remains positive through the planning horizon. This indicates that under assumed drier hydrology conditions the Near-Term Projects are necessary to maintain groundwater sustainability and that the Future Projects will provide an increase in groundwater in storage and a buffer for dry periods.

7.5.3 Underflow from DHSSB to MCSB

Underflow from DHSSB to MCSB is discussed below to address the CDWR recommendation to provide reasoning and evidence that maintaining groundwater above the 2009 levels is expected to reduce water quality impacts of groundwater with higher total dissolved solids flowing into the MCSB from the DHSSB (CDWR, 2019a). Section 5.7.3.1 provides a comparison of underflow prior to 2009 conditions and recent conditions using the groundwater model and draws the conclusion that no significant and unreasonable groundwater quality impacts are anticipated with groundwater levels in the MCSB maintained at or above 2009 groundwater levels. This subsection reviews the projected underflow from the DHSSB to the MCSB for the forecast scenarios considered for planning purposes through the planning horizon (2045). Mission Creek Fault underflows are compared to the average underflow from 1978 through 2001, which was about 1,220 AFY. This period was selected because it is prior to artificial recharge that began in 2002, which could affect the underflow.

The water balance for the Baseline scenario (**Table B21**) shows that simulated 2020 to 2045 underflow from DHSSB to MCSB ranges between approximately 1,150 and 1,840 and averages approximately 1,360 AFY, about 140 AFY more than the 1978 through 2001 average of about 1,220 AFY. The Baseline with Climate Change scenario (**Table B22**) shows that simulated 2020 to 2045 underflow from DHSSB to MCSB ranges between approximately 1,130 and 1,230 AFY and averages approximately 1,160 AFY, about 60 AF less than the 1978 through 2001 average of about 1,220 AFY.

The Near-Term Projects with Climate Change scenario (**Table B24**) shows that simulated 2020 to 2045 underflow from DHSSB to MCSB ranges between approximately 1,050 and 1,170 AFY and averages about 1,120 AFY, about 100 AFY less than the 1978 through 2001 average of about 1,220 AFY.

The Future Projects with Climate Change scenario (**Table B26**) shows that simulated 2020 to 2045 AFY underflow from DHSSB to MCSB ranges between approximately 1,030 and 1,170 AFY and averages about 1,110 AFY, about 110 AFY less than the 1978 through 2001 average of about 1,220 AFY.

The water balance results show that except for the Baseline scenario, the simulated underflow from DHSSB to MCSB is less than the 1978 through 2001 average underflow. Under the Near-Term Project and Future Project scenarios recharge of increased SWP deliveries at the MC-GRF results in increasing groundwater levels in the MCSB, reducing the groundwater elevation difference between DHSSB and MCSB, and thus reducing underflow from DHSSB to MCSB.

7.6 Summary and Conclusions

To evaluate selected water management options the calibrated 1936-2019 MCSB model was modified to simulate the 50-year period 2020 through 2069. Forecasts of future population growth were utilized to estimate future groundwater pumping demand and WWTP effluent. Forecasts of MFR were prepared based on 50 years of historical MFR from 1970 through 2019 and a 25-year drought cycle from 1995-2019.

Six forecast scenarios were developed and simulated to evaluate selected water management options. The first three scenarios assume a continuation of long-term historical hydrology and build on one another with additional water management projects. The second three scenarios assume drier climate change conditions and build on one another.

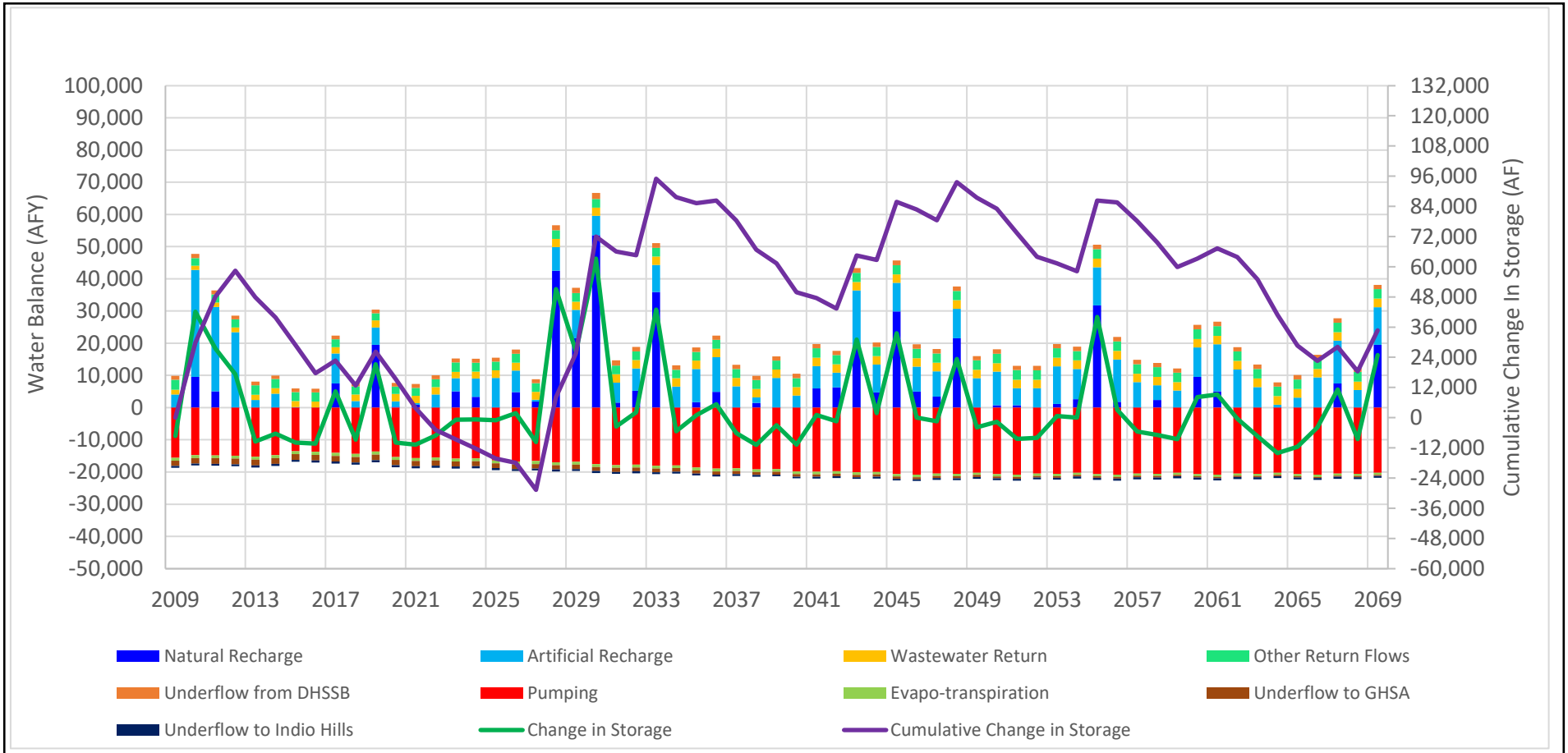
1. Baseline,
2. Near-Term Projects,
3. Future Projects,
4. Baseline with Climate Change,
5. Near-Term Projects with Climate Change, and
6. Future Projects with Climate Change.

The Baseline Forecast provides a useful and necessary benchmark while the forecasts with climate change represent a potential future with a "new normal" of ongoing below normal precipitation conditions Therefore, scenarios 1, 4, 5, and 6 are discussed in this section of the report. These scenarios are also described in **Appendix B** along with scenarios 2 and 3, which do not include assumed climate change. The forecasts were evaluated using simulated hydrographs for nine Key Wells in the MCSB and simulated water balances. Under the Baseline scenario, groundwater levels in all of the nine Key Wells fall below their respective Measurable Objective through the planning horizon of 2045. Groundwater levels in five Key Wells fall below their Minimum Threshold. The long-term cumulative water balance remains positive. Under the Baseline with Climate Change scenario, all wells fall below their respective Measurable Objectives, and six wells fall below their Minimum Threshold during the planning horizon. The long-term cumulative water balance is negative. Consequently, the assumptions used for the Baseline scenario and the Baseline with Climate Change Scenario result in unsustainable

conditions. The Baseline scenarios are only shown for comparison purposes and are not a scenario that is planned for implementation.

Under the Near-Term Projects with Climate Change scenario, three Key Wells fall below their respective Measurable Objectives, and all Key Wells stay above their Minimum Thresholds through the planning horizon of 2045. The long-term cumulative water balance is slightly positive. The Near-Term Projects with Climate Change scenario conditions are sustainable.

Under the Future Projects with Climate Change scenario, three Key Wells fall below their respective Measurable Objectives, and all Key Wells stay above their Minimum Thresholds through the planning horizon of 2045. Well 4P01 falls below its Measurable Objective in 2029 by 3.1 feet and then rebounds in 2041. Two wells that fall below their Measurable Objective (15R01 and 17J01) are in the southern part of the MCSB and only fall below their Measurable Objectives by 1.6 feet and 0.4 feet, respectively. Wells 4P01 and 15R01 have limited historical records and the Measurable Objectives for these wells are considered provisional. The long-term cumulative water balance is positive. The Future Projects with Climate Change scenario conditions are sustainable and show increases in groundwater in storage compared to the Near-Term Projects with Climate Change scenario.

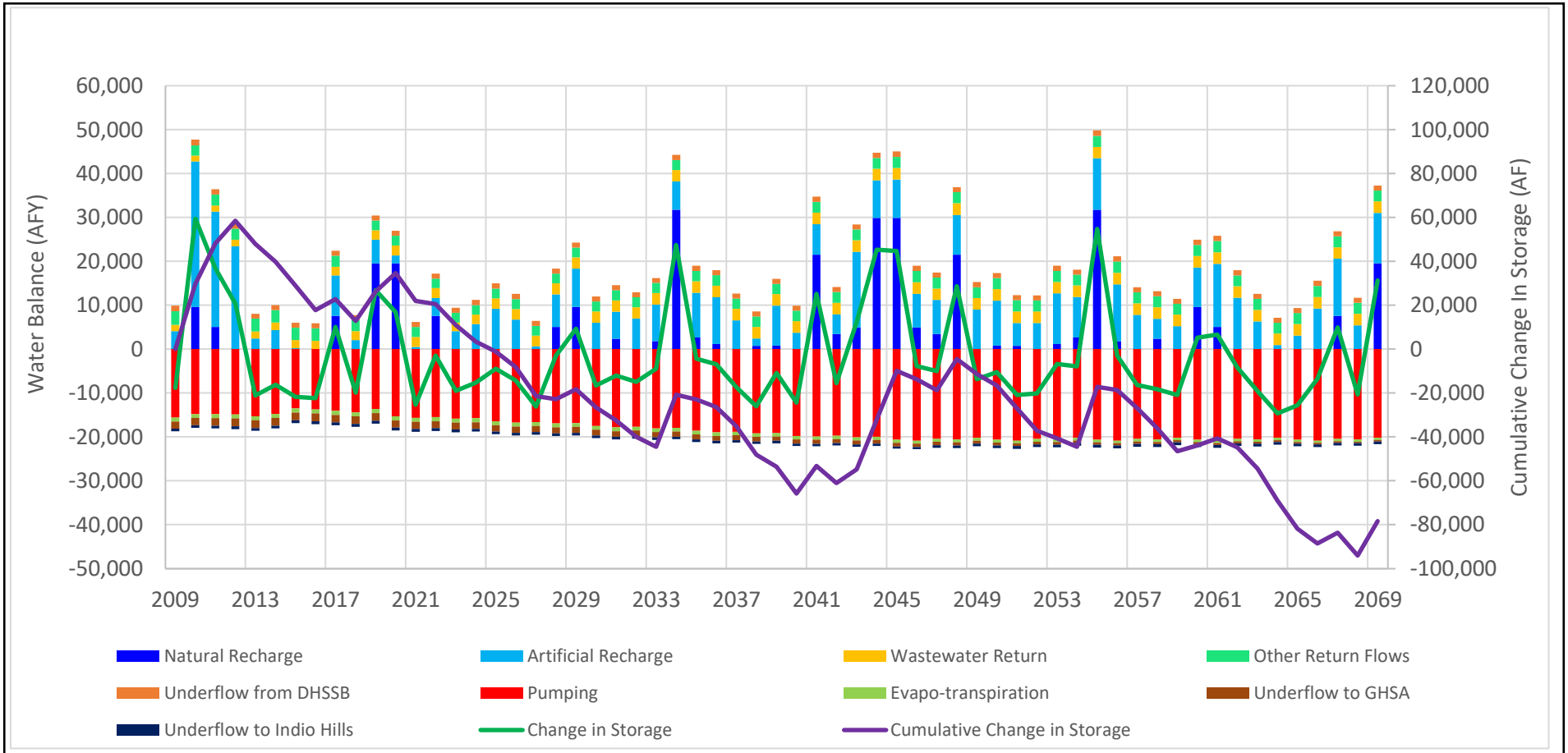


Abbreviations:
AF= Acre feet; AFY = Acre feet per year
DHSSB = Desert Hot Springs Subbasin
GHSA = Garnet Hill Subarea

Note: 2009-2019 Water balance inflows and outflows derived from calibrated model.

2009 - 2069 SIMULATED
WATER BALANCE FOR MISSION CREEK SUBBASIN
BASELINE SCENARIO
Mission Creek Subbasin Alternative Update
Coachella Valley, California

By: dmb	Date: 02/14/2022	Project No.: CM19167351
wood.		Figure 7-7

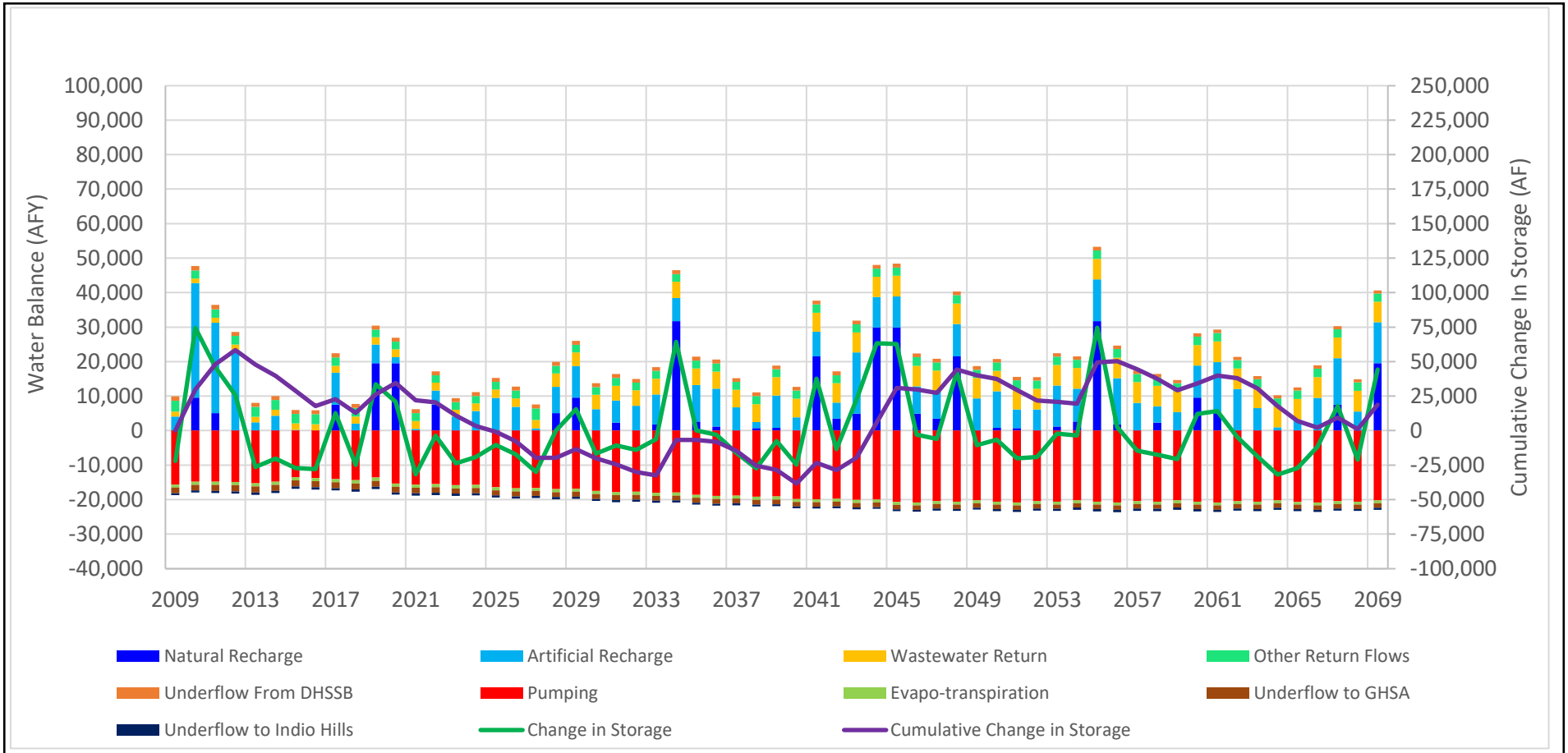


Abbreviations:
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DHSSB = Desert Hot Springs Subbasin
GHSA = Garnet Hill Subarea

Note: 2009-2019 Water balance inflows and outflows derived from calibrated model.

2009 - 2069 SIMULATED
WATER BALANCE FOR MISSION CREEK SUBBASIN
BASELINE W/CC SCENARIO
Mission Creek Subbasin Alternative Update
Coachella Valley, California

By: dmb	Date: 02/14/2022	Project No.: CM19167351
wood.		Figure 7-8

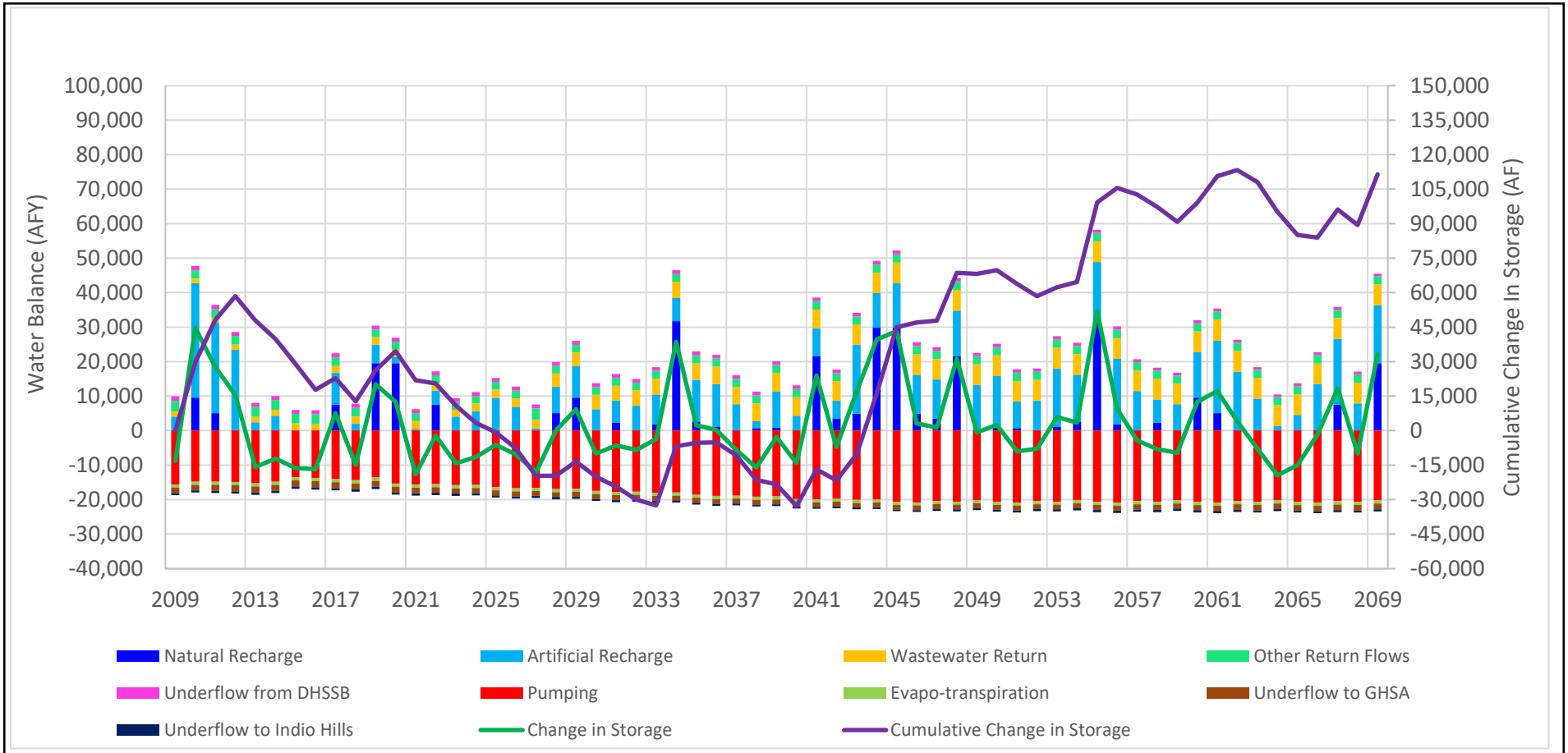


Abbreviations:
AF= Acre feet; AFY = Acre feet per year
DHSSB = Desert Hot Springs Subbasin
GHSA = Garnet Hill Subarea

Note: 2009-2019 Water balance inflows and outflows derived from calibrated model.

2009 - 2069 SIMULATED
WATER BALANCE FOR MISSION CREEK SUBBASIN
NEAR-TERM W/CC SCENARIO
Mission Creek Subbasin Alternative Update
Coachella Valley, California

By: dmb	Date: 02/14/2022	Project No.: CM19167351
wood.		Figure 7-9

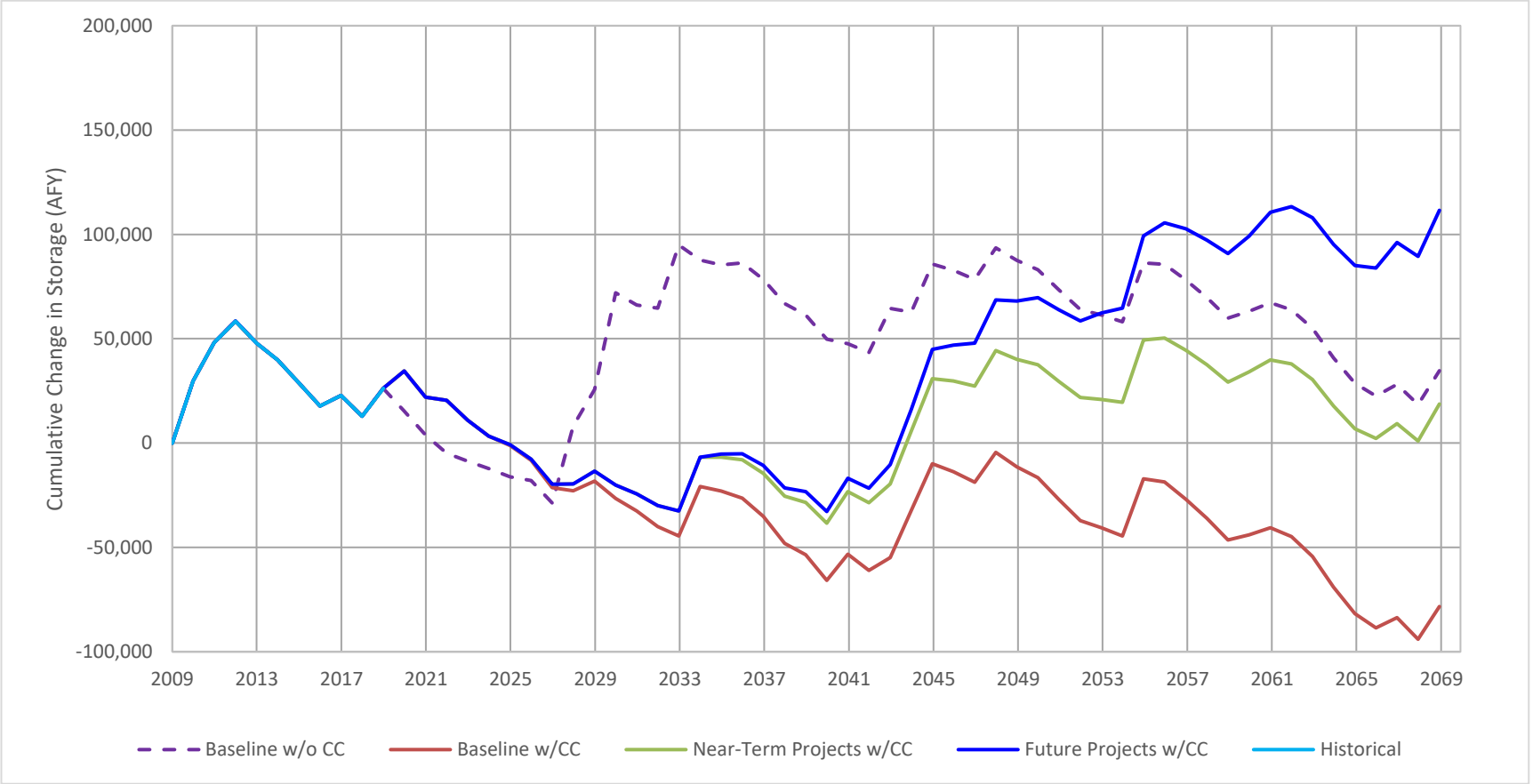


Abbreviations:
AF= Acre feet; AFY = Acre feet per year
DHSSB = Desert Hot Springs Subbasin
GHSA = Garnet Hill Subarea

Note: 2009-2019 Water balance inflows and outflows derived from calibrated model.

2009 - 2069 SIMULATED
WATER BALANCE FOR MISSION CREEK SUBBASIN
FUTURE PROJECTS W/CC SCENARIO
Mission Creek Subbasin Alternative Update
Coachella Valley, California

By: dmb	Date: 02/14/2022	Project No.: CM19167351
wood.		Figure 7-10



Abbreviations:
AFY = Acre feet per year
MCSB = Mission Creek Subbasin
w/o CC = with out Climate Change
w/CC = with Climate Change

Note: 2009-2019 Cumulative Change in Storage derived from calibrated model.

COMPARISON OF SIMULATED MCSB
CUMULATIVE CHANGE IN STORAGE
Mission Creek Subbasin Alternative Update
Coachella Valley, California

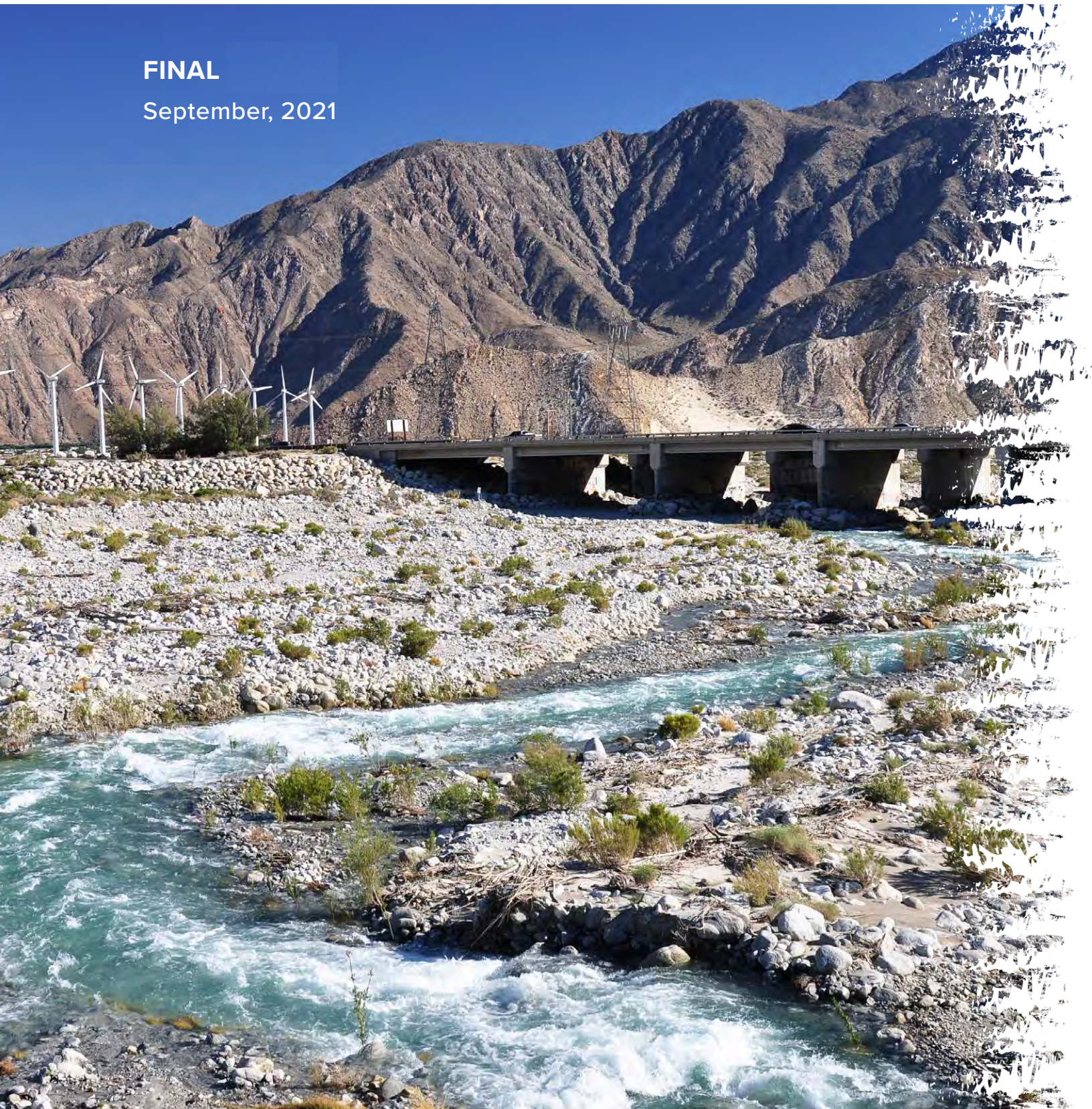
By: dmb	Date: 02/14/2022	Project No.: CM19167351
wood.		Figure 7-11

COACHELLA VALLEY WATER DISTRICT

CLIMATE ACTION & ADAPTATION PLAN

FINAL

September, 2021



CAAP Lead Agency

Coachella Valley Water District

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EXECUTIVE SUMMARY

CAAP MISSION STATEMENT

The Coachella Valley Water District (CVWD) recognizes the potential impact of climate change to its mission of providing high quality water to the Coachella Valley region at a reasonable cost in a reliable manner. CVWD has been reliably providing water since 1918, yet has begun to experience the high variability effects of climate change from extreme rainfall and 52 recorded flooding events between 1997 and 2018 to persistent drought conditions that have escalated to extreme or exceptional drought conditions every year between 2014 and 2018.

This Climate Action and Adaption Plan (CAAP) provides a comprehensive assessment of CVWD's current operations and water supplies, and identifies the measures, policies, and projects that have been developed to reduce operational greenhouse gas (GHG) emissions. The development of the CAAP is part of CVWD's Fiscal Year 2021 Strategic Initiative. As such, the CAAP will support CVWD's efforts to identify projects to reduce GHG emissions and improve water supply resiliency in the face of climate change, as well as to obtain funding necessary to implement such projects and further support CVWD's mission.

CVWD SUCCESSES

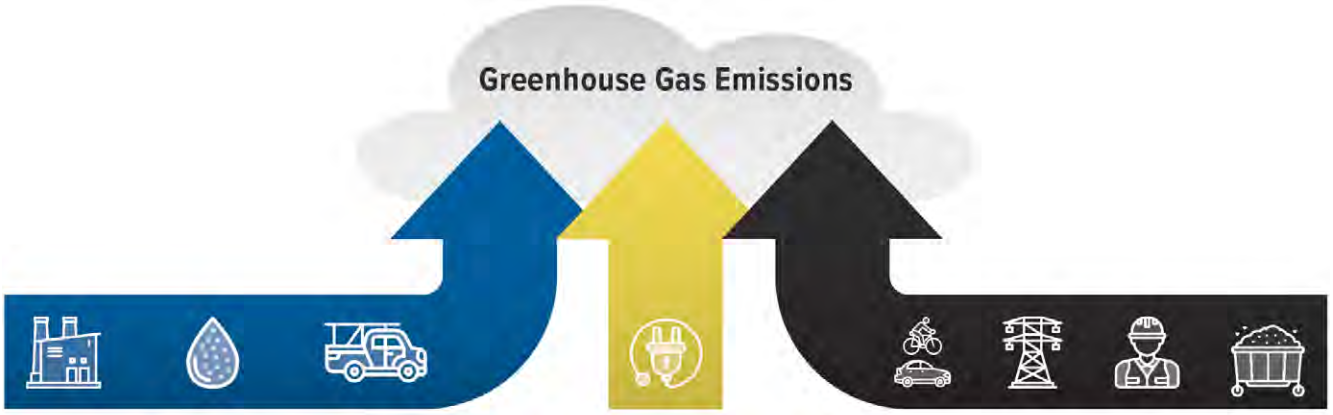
CVWD is actively working to improve sustainability in its operations and end uses among its customers. CVWD runs rebate programs for homeowners to invest in water-efficient landscaping and washing equipment, seminars and workshops to educate its customers, including commercial and agricultural end-users, water conservation contests for homes and businesses, and a number of other water conservations programs that target commercial and agricultural water efficiency. CVWD also operates five water reclamation plants that provide water recycling services to further conserve water within its service area. CVWD complies with the Sustainable Groundwater Management Act and adopted a Sustainable Groundwater Management Plan. CVWD's emphasis on sustainable water management provides the catalyst for developing its first CAAP to reduce GHG emissions from the district's operations while adapting to climate change.



GHG EMISSIONS INVENTORY

CVWD operations generate GHG emissions through natural gas combustion, wastewater process emissions, vehicle fleet and equipment usage, electricity usage, out-of-boundary waste processing, construction projects, electricity transmission and distribution, and employee commuting. As part of the CAAP development process, a multi-year inventory of GHG emissions resulting from CVWD's GHG-generating activities was prepared for CVWD operations between 2016 and 2019. CVWD exercises direct control over some of their GHG- generating activities, while other activities, such as employee commute, are not directly under CVWD's control. GHG-generating activities are therefore, categorized into three "scopes" which describe three levels of operational control (Figure ES-1).

Figure ES-1. Scope Categories



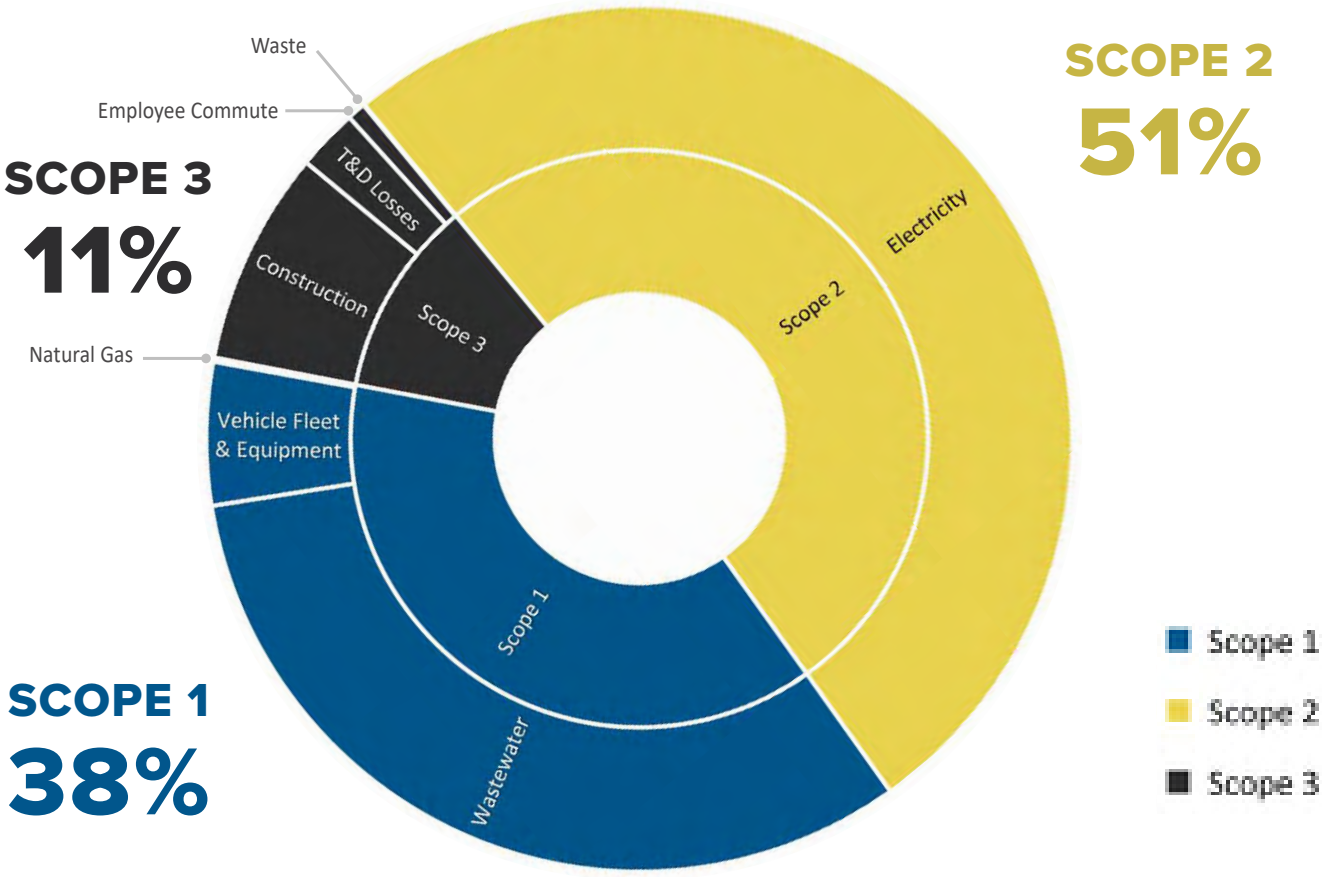
Consists of activities that are directly controlled by the organization, and include natural gas combustion, wastewater process emissions, vehicle fleet, and equipment usage.

Consists of activities associated with the consumption of purchased electricity.

Consists of all other activities not covered under Scope 2 that are not directly controlled by the organization but are fundamental to the organization's operation, including out-of-boundary waste processing, construction projects, electricity transmission and distribution, and employee commute.

CVWD emitted approximately 68,000 metric tons (MT) of carbon dioxide (CO_2e) per year on average between 2016 and 2019. As shown in Figure ES-2, the largest source of GHG emissions at CVWD is electricity usage (Scope 2 at 51%), followed by wastewater treatment, vehicle fleet and natural gas combustion (Scope 1 at 38%). Indirect emissions (Scope 3), including construction, employee commute, waste generation, and transmission and distribution losses associated with electricity, make up the remaining 11 percent of CVWD's GHG emission profile. As such, the largest portion of GHG emissions generated by CVWD (i.e., Scope 1 and Scope 2 emissions) are under CVWD's operational control.

Figure ES-2.Average GHG Emissions by Scope



CVWD GHG TARGETS

The primary drivers of climate action at the state level are Assembly Bill (AB) 32, Senate Bill (SB) 32, and Executive Order (EO) B-55-18. SB 32, the successor to AB 32, requires the state of California to achieve a statewide reduction in GHG emissions of 40 percent below 1990 levels by 2030, while EO B-55-18 established the statewide goal to reach carbon neutrality by no later than 2045. While CVWD is not beholden to AB 32, SB 32, or EO B-55-18, and currently faces no legislative requirements to reduce their GHG emissions, the state's SB 32 Scoping Plan adopted in 2017 recognizes water agencies as one of the largest opportunities for reducing energy emissions in California. Further, it is anticipated that additional legislation and regulations will be established in the future that could require CVWD to adopt low-carbon practices and operations. As such, CVWD has elected to establish GHG emission reduction goals in alignment with the state's goals to provide a framework for achieving voluntary GHG emissions reductions in future years.

As shown in Table ES-1, this CAAP establishes a climate action target or reduction goal for 2030 and a longer-term GHG emissions reduction goal for 2045. The 2030 and 2045 targets align with California SB 32 and EO B-55-18, respectively.

Table ES-1. CVWD Climate Action Targets

Target Description		1990	2030	2045
CVWD's Climate Action Targets	Percent Reduction from 1990	N/A	40%	100%
	Per Capita Emissions (MT CO_2e/person)[1]	0.26	0.16	0.00
	Absolute Emissions (MT CO_2e)	76,558	49,927	0

Note: CVWD has established per capita targets and will monitor progress towards these targets using per capita metrics. For reference, the per capita targets have been translated to absolute emissions in units of MT CO_2e, but these values do not represent CVWD's official targets.

1. *Per capita emissions are calculated by dividing the emissions attributable to CVWD operations by the customer base that CVWD serves.*

REDUCTION STRATEGY SUMMARY

CVWD's targets represent the best intentions with respect to GHG emissions reduction efforts. To move CVWD towards their established GHG targets, the CAAP includes 12 measures, each with their own supporting actions. Table ES-2 shows each of the 12 measures and their expected contribution to CVWD's GHG emissions reductions. As shown in Table ES-2, these measures have the potential to reduce GHG emissions by 9,816 MT CO_2e by 2030 and an additional 5,848 MT CO_2e by 2045. While the measures and actions identified in this CAAP will not fully close the gap between CVWD's forecasted emissions and its GHG emission targets, implementation of these measures will lead to significant progress in reducing GHG emissions, provide a foundation for aligning with State goals, and improve resiliency of CVWD's facilities. CVWD is committed to monitoring their progress and continuing to identify opportunities for further reductions to achieve their targets.. This CAAP includes an implementation and monitoring plan (Section 6) to guide CVWD on the steps to achieve and track the CAAP over the next five to ten years.

Table ES-2. Measures – At a Glance

ID	Measure	2030 GHG Reduction (MT CO_2e)	2045 GHG Reduction (MT CO_2e)
Scope 1			
DC-1	Phase out natural gas combustion at CVWD facilities, such that 50% of natural gas combustion equipment is replaced with electric equivalents by 2030.	55	122
FL-1	Replace vehicle fleet with zero-emission vehicles as technology allows in alignment with the Advanced Clean Fleet Rule, such that by 2030 40% of vehicle fleet are zero emissions vehicles and by 2045 100% of the vehicle fleet are zero emissions.	761	4,080
FL-2	Use alternative fuels to bridge the technology gap to zero emission vehicles and off-road equipment by achieving 100% replacement of #2 diesel with 100% renewable diesel by 2030.	1,066	1,210
FL-3	Reduce vehicle miles traveled and fuel use for non-ZEV/EV fleet vehicles.	417	0

ID	Measure	2030 GHG Reduction (MT CO_2e)	2045 GHG Reduction (MT CO_2e)
WW-1	Reduce GHG process emissions associated with wastewater treatment.	Supportive[1]	Supportive[1]
Scope 2			
E-1	Utilize low-carbon and carbon-free electricity.	4,486	0
EE-1	Improve energy efficiency at CVWD facilities and buildings.	2,965	0
Scope 3			
WG-1	Increase organic waste diversion to achieve 75% reduction in landfilled organic waste by 2025 and zero-waste by 2045.	10	32
TR-1	Incentivize more sustainable commutes.	56	95
WC-1	Increase water conservation and local water supply.	Supportive[1]	Supportive[1]
CS-1	Investigate and implement carbon capture and sequestration opportunities.	Supportive[1]	Supportive[1]
CR-1	Reduce construction-related GHG emissions by CVWD through emissions reduction controls and/or equipment requirements.	Supportive[1]	Supportive[1]
GHG Reduction Summary			
Total GHG reductions with full implementation of all measures		**9,816**	**5,848**
Total GHG reductions needed to meet targets[3]		**19,499**	**45,781**
GHG reductions remaining		**9,683**	**39,933**

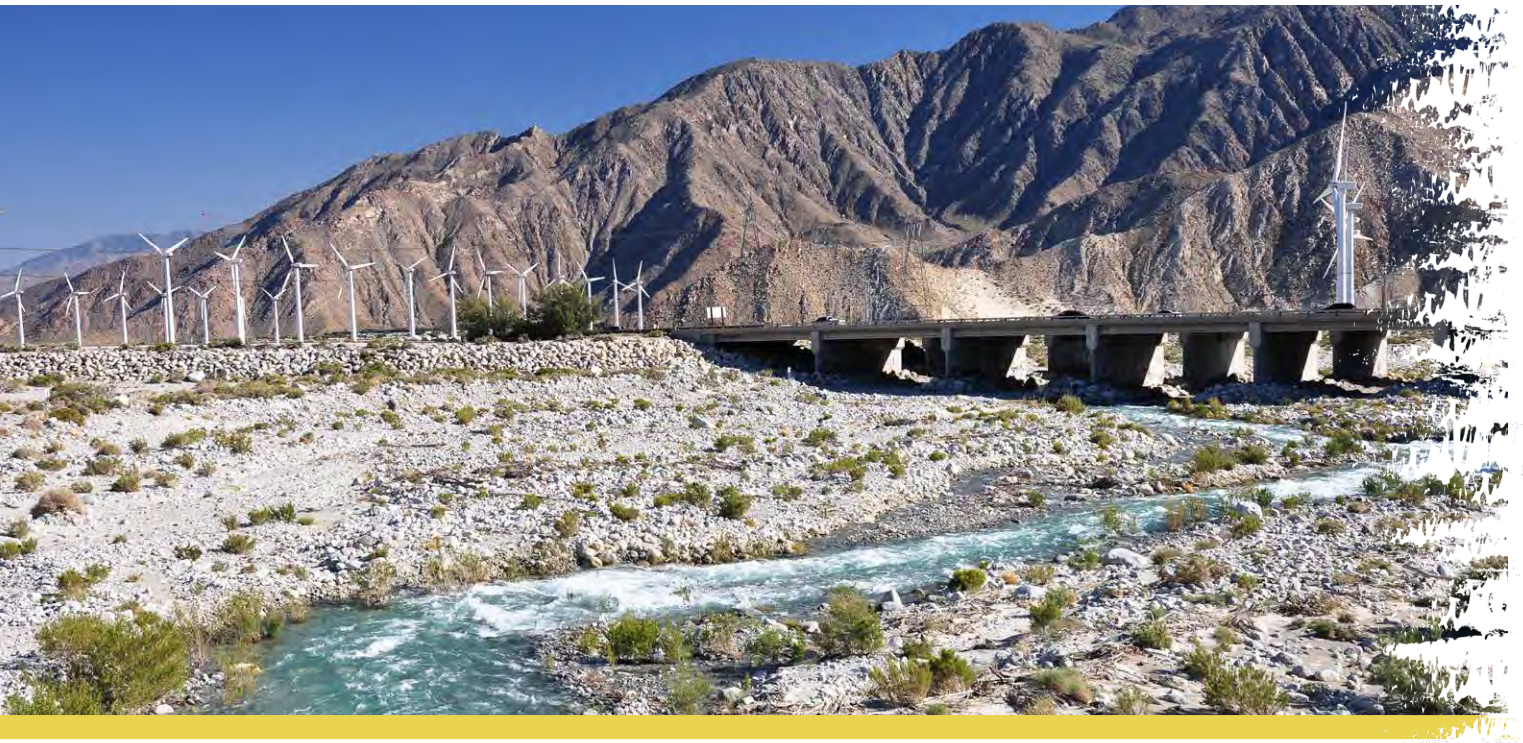
Notes: Values have been rounded and may not add up exactly. See Appendix C for methodology and calculations details. MT CO_2e = metric tons of carbon dioxide equivalent; ZEV/EV = zero emission vehicle/ electric vehicle; GHG = greenhouse gas; DC = Direct Combustion; FL = Fleet; WW = Wastewater; E = Electricity; EE = Energy Efficiency; WG = Waste Generation; TR = Transportation; WC = Water Conservation; CS = Carbon Sequestration; CR = Construction.

[1] Supportive measures are those that are not quantifiable as a standalone action but may support quantifiable actions through providing opportunities for studying technologies, establishing policies, etc. Additionally, some measures are listed as supportive as they are in the early phase of implementation and the extent of quantifiable GHG reductions is dependent on the completion of the preceding actions (e.g., conduct feasibility study). Therefore, such measures are conservatively listed as supportive to not overestimate GHG reduction potential.

[2] GHG emission reduction potential is based on all electricity switching to a 50% green rate tier through SCE and IID as part of Measure E-1. The GHG emission reduction potential would increase to 29,712 MT CO_2e by 2030 with all electricity switched to 100% renewable electricity as part of Measure E-1.

[3] As described in Section 4, CVWD established GHG reduction goals in alignment with a SB 32 Efficiency Target pathway.





1. INTRODUCTION

VISION

The Coachella Valley Water District's (CVWD) Climate Action and Adaption Plan (CAAP) provides a comprehensive assessment of CVWD's current greenhouse gas (GHG) emissions related to operations and water supplies. The CAAP includes an inventory of existing, historic, and projected GHG emissions, and identifies the measures that have been developed to reduce GHG emissions and increase climate resiliency. CVWD exercises direct and indirect control over GHG generating activities, and understands the responsibility and contribution to be made towards the larger cumulative effort to address climate change in California. Implementation of this CAAP will increase CVWD's resilience to both existing and anticipated

climate change effects through 2045. The CAAP demonstrates CVWD's commitment to aligning with California's GHG reduction goals to work towards limiting global temperature rise below 2 degrees Celsius in this century, while continuing to provide reliable, safe, and affordable water throughout CVWD's service area.

The development of CVWD's inaugural CAAP was identified within CVWD's FY21 Strategic Plan as Initiative 2 (Goal: Water Quality & Environmental Leadership), and is intended to improve project eligibility for state/Federal grant and loan application packages to support CVWD's Capital Improvement Programs. As such, the CAAP will support CVWD's efforts to identify projects that reduce GHG emissions and improve water supply resiliency in the face of climate change, as well as to obtain funding necessary to implement such projects, thereby supporting CVWD's mission. Additionally, the CAAP complements CVWD's long-range planning efforts including the *2020 Coachella Valley Regional Urban Water Management Plan, 2018 Coachella Valley Integrated Regional Water Management (IRWM) & Stormwater Resources (SWR) Plan*, the *2019 Coachella Valley Water District Hazard Mitigation Plan,* the *Coachella Valley Water District Sanitation Master Plan Update 2020*, and ongoing water conservation programs.

CVWD recognizes that climate plays a central role in the operation, planning, and management of water resource systems for water supply, flood management, and environmental stewardship. Historically, an understanding of the climate system and experience with meteorological and hydrological events have been on the basis for planning and water resource management. However, climate change is impacting the timing and form of precipitation; the timing, magnitude, and distribution of runoff; and the availability of water for beneficial use in unpredictable ways.

The potential impacts of climate change on water resources may be felt through changes in temperature, precipitation, and runoff. In particular, the Colorado River Hydrologic Region is subject to climate vulnerabilities such as reduced quality and availability of imported water; reduced groundwater replenishment; increased frequency and intensity of flooding events; increased risk of large wildfires and impacts on affected infrastructure; and increased temperatures and extreme heat events (*Section 2*). Increased temperatures in the Coachella Valley cause increased water demands for crop and landscape irrigation, municipal water use, and contribute to evaporative losses from canals and open reservoirs. As such, the implications of climate change regionally and nationally may adversely impact the Coachella Valley's water resources.

CVWD Mission and Water Supply Goal

CVWD's mission is to meet the water-related needs of the people through dedicated employees and providing high-quality water at a reasonable cost. This mission applies to all CVWD activities, as CVWD provides water-related services for domestic use and agricultural irrigation, manages drainage, replenishes the groundwater basin, collects and treats wastewater, distributes recycled water, and provides regional stormwater management and flood protection.

CVWD holds a unique water rights position, as a special water district with rights to Colorado River water and as a California State Water Project contractor. Additionally, CVWD engages in several water conservation projects to supplement the needs of its service area, and offers numerous water conservation programs and rebates to its residential and business customers.

To meet CVWD's mission, this CAAP was developed to align with CVWD's goals and long-range planning efforts, with the intent to reduce GHG emissions associated with water distribution over time. The following section provides an overview of existing CVWD plans that provided the basis for this CAAP, to ensure cohesion among long-range planning efforts by CVWD.



CVWD Long-Range Planning

As an urban water supplier, CVWD is required to prepare an Urban Water Management Plan (UWMP) every five years in response to the requirements of the UWMP Act, California Water Code Sections (CWC) 10610 through 10656. To this end, in June 2020, CVWD's Board of Directors approved the 2020 Coachella Valley Regional Urban Water Management Plan (RUWMP 2020). CVWD coordinated their planning efforts with several local water agencies to calculate demand projections, characterization of shared supplies, and planning for potential water shortages. This partnership included CVWD, Coachella Water Authority (CWA), Desert Water Agency (DWA), Indio Water Authority (IWA), Mission Springs Water District (MSWD), and Myoma Dunes Mutual Water Company (MDMWC). UWMPs are required to support long-term resource planning to ensure that adequate water supplies are available to meet existing and future water needs. UWMPs must assess the reliability of water sources over a 20-year planning horizon during normal, single-dry, and multiple-dry years; describe management measures and water shortage contingency plans; report progress toward meeting conservation goals and targeted reduction in per-capita urban water consumption; and discuss the current and planned uses of recycled water. To be consistent with anticipated growth in operations, water supply and demand projections are incorporated into the CAAP.

The *2018 Coachella Valley Integrated Regional Water Management & Stormwater Resources Plan* (IRWM & SWR Plan) addresses the requirements of the California Department of Water Resources (DWR). The IRWM & SWR Plan was developed by the Coachella Valley Regional Water Management Group (CVRWG), a partnership composed of five Coachella Valley water purveyors including CVWD. The IRWM & SWR Plan addresses reliability for long-term water supply as well as stormwater and dry weather runoff capture pursuant to SB 985. The IRWM & SWR Plan identifies water management issues and needs, evaluates resource management strategies, and establishes a framework for implementation of projects that focus on improving water quality, reduce local flowing and increase water supplies in the watershed. Per the requirements of the DWR, IRWM plans must include an analysis of the effects of climate change on water resources and identify climate change vulnerabilities. Given the identified vulnerabilities of the regions water supply and flood management to climate change, the IRWM & SWR Plan not only includes adaption and mitigation for climate change as factors included for consideration in evaluating projects, but also established that priority projects are expected to mitigate climate change through reduction in energy consumption and GHG emission reductions whenever feasible.

Other long-range planning documents such as the 2019 Coachella Valley Water District Hazard Mitigation Plan (HMP), have identified CVWD's environmental hazards and vulnerabilities and recommend specific actions to minimize such vulnerabilities. This was the first hazard mitigation plan developed by CVWD and explicitly sets a goal to increase the resiliency of CVWD by "ensuring hazard mitigation and climate change policies, projects, and activities receive consideration for funding, integration, and implementation." Included in the plan, is a series of hazard mitigation actions to be completed by CVWD over the next few years to address hazards. The CAAP complements the strategy and hazard mitigation actions detailed in the HMP.

The Coachella Valley Water District Sanitation Master Plan Update 2020 (SWP) establishes the comprehensive, long-term capital improvement program (CIP) to be implemented at CVWD between 2021 and through the horizon year of 2040. The SMP includes recommendations for specific sanitation projects for CVWD to undertake such as refurbishment of existing assets, operation optimization, and sanitation system upgrades to allow CVWD to plan for expansion and projected capacity needs in the future. Although not explicitly addressed, projects optimizing the operation of the sanitation system or improving the wastewater treatment plant process and efficiency can reduce GHG emissions. Therefore, the CAAP aligns with and highlights opportunities within the SWP that would reduce GHG emissions.



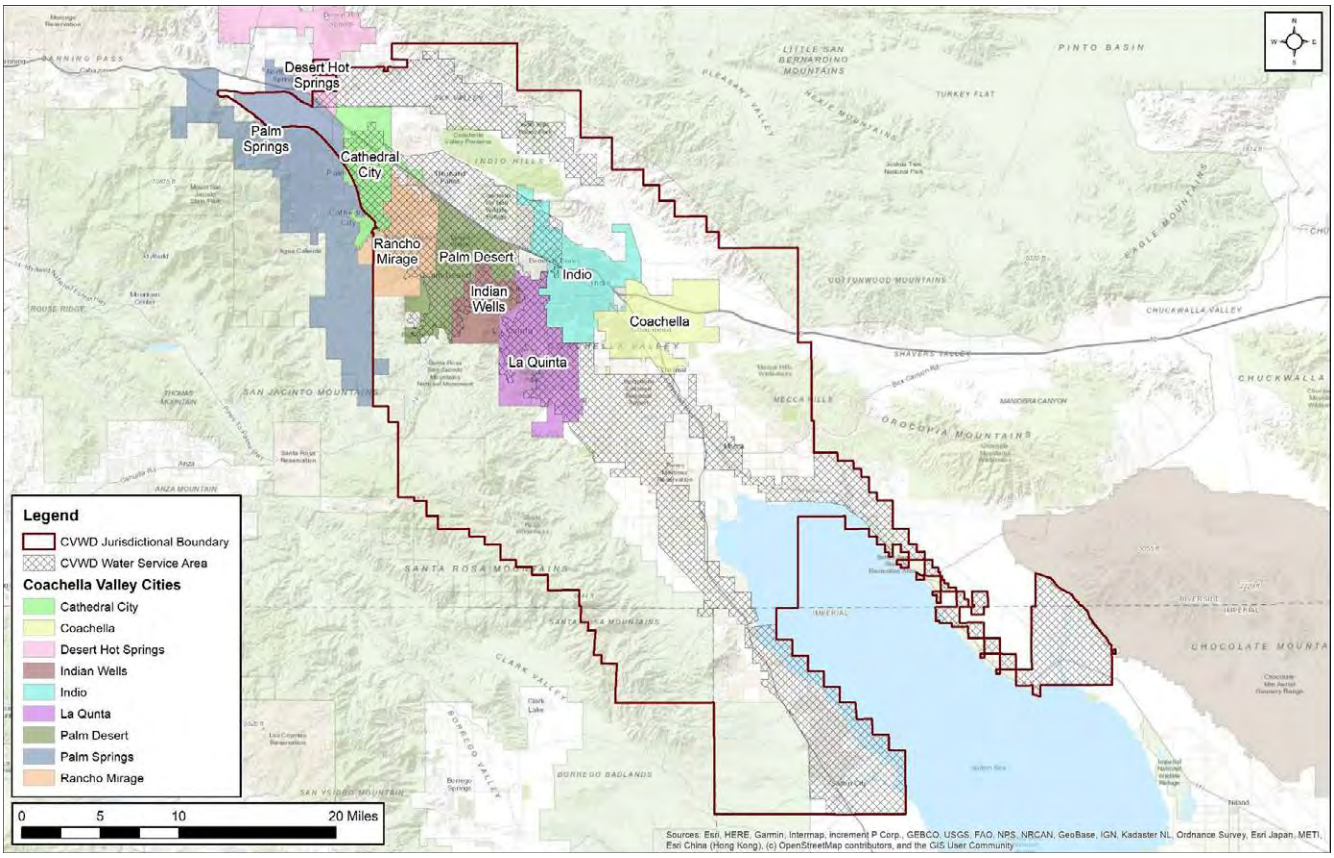
CVWD Service Area and Climate

The CVWD service area, shown in Figure 1-1, is located in Northern Sonoran Desert of Southern California, and within the Colorado River Hydrologic Region as defined by the Department of Water Resources. Most of the Colorado River region has a subtropical desert climate with hot summers and short, mild winters. The mountain ranges on the northern and western borders, in particular the San Bernardino and San Jacinto Mountains, create a rain shadow effect for most of the region. Annual average rainfall amounts on the Valley floor range from a little over 6 inches to less than 3 inches. Most of the precipitation for the region occurs in the winter and spring. However, monsoonal thunderstorms, spawned by the movement of subtropical air from the south, can occur in the summer and generate significant rainfall in some years. Higher annual rainfall and milder summer temperatures occur in the mountains to the north and west.

Data from climate stations in Palm Springs and Thermal (Desert Resorts Regional Airport) can be used as an indicator of climate in the CVWD service area. Monthly average temperature reaches as high as 108 degrees Fahrenheit (F) and monthly average low temperatures are 38 degrees F. Precipitation typically occurs during the winter months with an annual mean rainfall of approximately 5.5 inches in Palm Springs and 3.0 inches in Thermal.



Figure 1-1. CVWD Service Area Map



Source: 2020 Coachella Valley Regional Urban Water Management Plan
http://www.cvwd.org/DocumentCenter/View/5482/Coachella-Valley-RUWMP

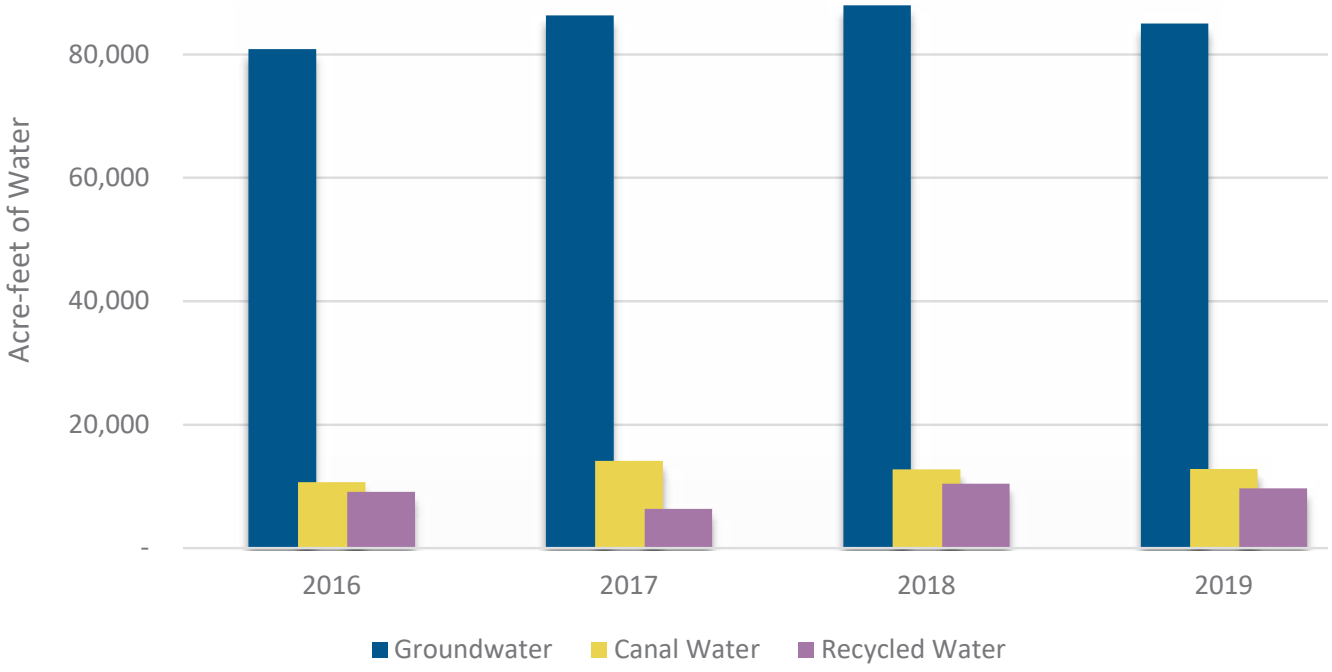


CVWD Statistics

CVWD provides several water-related utility services to approximately 300,000 people in the Coachella Valley. This includes providing domestic and drinking water to approximately 108,000 homes and businesses, and serving over 94,000 wastewater accounts covering approximately 1,000 square miles with five CVWD owned and operated wastewater treatment plants. Additionally, CVWD maintains 123 miles of the Coachella Canal to provide Colorado River water for agriculture and irrigation needs, protects approximately 600 square miles of service area from flooding through stormwater control and management, and manages local groundwater through groundwater replenishment. CVWD pumps, treats, and delivers groundwater for domestic uses and delivers canal water and recycled water for irrigation and other non-potable uses. Water delivered per year by CVWD from 2016-2019 is shown in Figure 1-2.

CVWD's GHG emissions associated with these water deliveries are primarily from the purchase and consumption of electricity used for water treatment, conveyance, and delivery of water throughout CVWD's service area, as well as process emissions associated with CVWD's five wastewater reclamation plants.

Figure 1-2. Water Delivered per Year (AFY) by CVWD



CAAP PURPOSE

The CAAP is a long-range planning document that guides CVWD towards long-term emission reductions and adaptation to climate change impacts in alignment with the State of California goals, mandates, and current legislation. The CAAP includes an analysis of CVWD operations and associated emission sources, forecasts future emissions, highlights vulnerabilities, and establishes emission reduction and adaptation goals and measures. This CAAP will help inform policy and planning decisions on operations, water resources, capital investments, conservation, and local resource programs. Additionally, the CAAP aligns with CVWD's long-range plans including the 2020 RUWMP, IRWM & SWR Plan, SMP, and HMP. The CAAP will support CVWD's efforts to adjust operations as feasible to adapt to climate change effects and to obtain infrastructure grant/loan funding necessary for increasing resiliency.

In the CAAP, CVWD establishes GHG emissions reduction goals that align with those set by the State of California. The emissions inventory and forecast presented in Section 3 provides a basis for CVWD to establish goals for future GHG reductions. CVWD is setting a goal to reduce per capita GHG emissions 40 per- cent below 1990 levels by 2030, thereby aligning with the goals of SB 32, which requires a 40 percent reduction in emissions from 1990 levels.

The CAAP creates a roadmap that provides CVWD with a broad range of measures to mitigate or reduce GHG emissions in line with state goals based on operational feasibility and cost. The CAAP will help CVWD reduce overall GHG emissions from its operations and aligns CVWD with state mandates and legislation, while providing consistency with CVWD's mission. In addition to establishing a path- way to CVWD's emissions reduction goal of 40 percent below 1990 levels by 2030, the CAAP does the following:

- Incorporates climate legislation and guidance from state, Federal, and international sources
- Identifies cost-effective energy efficiency and decarbonization measures
- Provides co-benefits, such as improved operational resilience and air quality
- Integrates actions to transition away from fossil fuel use in alignment with California's clean fleet goals and strategies to reduce GHG emissions from the transportation sector
- Identifies shovel-ready projects that are aligned with state and federal funding priorities

CAAP Intent and Use

The CAAP provides a comprehensive analysis of CVWD's operations and associated GHG emission sources as well as a programmatic guide for opportunities to reduce GHG emissions. This CAAP is not intended to serve as a qualified GHG Reduction Plan per the California Environmental Quality Act (CEQA) requirements of Section 15183.5(b). Although the CAAP discusses climate-related impacts and provides GHG reduction measures, it cannot be used to tier or streamline development projects as they relate to CEQA requirements. CVWD provides a critical service that is their priority; CVWD is also committed to implementing GHG reduction measures to the extent they are feasible and cost-effective. The CAAP's intent is to serve as an informative document that introduces concepts related to climate action planning and establishes a set of measures that align with the state's GHG reduction goals and associated legislation that CVWD can implement to reduce GHG emissions. By defining specific reduction goals, CVWD can track its progress towards meeting its goals and measure the success of its CAAP measures.

CAAP Implementation Tracking

CVWD is committed to tracking the implementation of this CAAP using a specialized tracking tool called CAPDash.[1] CVWD will use this information to monitor its consistency with its GHG reduction goals (Section 4), evaluate the effectiveness of the CAAP at reducing GHG emissions, and adjust measures as necessary. The CAAP measures and actions in Section 5 include identification of the responsible entity/entities, timing, and monitoring approach. Section 6 details how GHG emissions will be measured on an annual basis, and how and when the CAAP will be updated. The CAAP is anticipated to be updated every five years, or sooner if needed, to ensure progress towards meeting CVWD's GHG reduction goals. CVWD can track the implementation of the CAAP measures and actions using CAPDash, and provide feedback information to refine its overall management strategies.

1. *CAPDash is a cloud based GHG Inventory Monitoring and Reporting Tool that generates a transparent GHG inventory that can be updated on an annual basis by uploading activity data and tracks the implementation of the CAAP measures over time. All final CAAP measures will be uploaded into CAPDash allowing CVWD to track activity data for each measure and monitor progress over time. The tool additionally serves as an automatically updating dashboard that displays data that can be used internally for reporting and for external display.*

HISTORY AND CURRENT OPERATIONS

This section provides an overview of CVWD's history and operations, including its water supply sources, treatment requirements, and infrastructure.

CVWD Formation and Service Area

CVWD is a special district formed in 1918 under the County Water District Act provisions of the California Water Code. CVWD is governed by a five-member Board of Directors that are elected to four-year terms by the voters residing in the five directorial divisions. As a government agency, CVWD policies are regulated by state and Federal agencies rather than by the Public Utilities Commission.

The Coachella Valley encompasses the northwestern portion of the Salton Trough and is bounded by the Santa Rosa-San Jacinto Mountains on the west, and the San Bernardino Mountains to the north and northeast. CVWD's service area covers approximately 1,000 square miles from the San Gorgonio Pass to the Salton Sea. , and is the largest urban water supplier in Coachella Valley. CVWD's service area includes nine incorporated cities, as well as several census designated places and unincorporated areas of three separate counties; CVWD is primarily within Riverside County, though its service area extends into the northeastern portion of San Diego County and the northern portion of Imperial County.

Coachella Valley is divided geographically into the West Valley and the East Valley. The West Valley encompasses the cities of Palm Springs, Cathedral City, Rancho Mirage, Indian Wells and Palm Desert, while the East Valley included the cities of Coachella, Indio, La Quinta and the communities of Bermuda Dunes, Mecca, and Thermal. Water service to the West Valley is primarily based on resort- and recreation-based needs, and relies on local groundwater. The East Valley is primarily characterized by an agriculturally based economy and relies on both local groundwater and imported Colorado River water delivered via the Coachella Canal. Refer to Figure 1-1 for CVWD's Service Area Map.

CVWD Water Operations Overview

CVWD provides multiple water-related services including domestic (drinking) water supply, wastewater collection and treatment, recycled water, agricultural irrigation, drainage management, imported water supply, groundwater replenishment, stormwater management and flood control, and water conservation. The following sub-sections describe the water sources and supplies used to meet the needs of CVWD's water service customers.

CVWD Water Sources and Supply

CVWD's water supplies include local groundwater from Whitewater River (Indio) Subbasin and the Mission Creek Subbasin common water supplies, recycled water from two CVWD-owned water reclamation plants, and imported supplies from the Colorado River. Water supplies are used to meet CVWD's urban and non-urban water demands and to replenish local groundwater supplies. CVWD also conducts groundwater replenishment to reduce groundwater overdraft and associated land subsidence issues. Groundwater is the principal source of municipal water supply in the Coachella Valley and meets 100 percent of CVWD's domestic and potable water demands.

Domestic Water Delivery

CVWD is the largest urban water supplier in the Coachella Valley with over 100,000 municipal connections. CVWD's domestic water system has 64 pressure zones and consists of approximately 97 groundwater production wells, 2,000 miles of pipe, and 133 million gallons of storage in 65 enclosed tank reservoirs.

Irrigation Water Delivery and Agricultural Drainage

CVWD's irrigation system provides Colorado River water to over 1,200 customers covering over 75,000 acres via the 123-mile, concrete-lined, Coachella Branch of the All-American Canal. The irrigation distribution system consists of 485 miles of buried pipe, 16 pumping plants, and 1,300 AF of storage. Due to a high perched groundwater table and concentration of salts in irrigated soils within CVWD's service area, an agricultural drainage system is necessary. CVWD operates and maintains an agricultural drainage system consisting of 166 miles of buried pipe ranging in size from 18 inches to 72 inches in diameter and 21 miles of open channels to serve as a drainage network for irrigated lands. The system receives water from on-farm drainage lines. In most areas, the drainage system flows to the Coachella Valley /Whitewater River Stormwater

Channel. However, in areas near the Salton Sea, a number of open channels convey flows directly to the sea.

Groundwater Recharge

CVWD operates and maintains groundwater recharge facilities at three locations in the Coachella Valley: Whitewater River Groundwater Replenishment Facility, Palm Desert Groundwater Replenishment Facility and the Thomas E. Levy Groundwater Replenishment Facility.

CVWD Wastewater and Recycled Water

CVWD owns and operates five wastewater reclamation plants (WRPs) that receive a combined average of 17 million gallons of wastewater a day and serving over 94,000 accounts. All five of the WRPs operate using aerobic methods with varying influent loads and Biochemical Oxygen Demand (BOD)[5]. Currently, approximately 6.3 billion gallons of wastewater is treated at these WRPs annually. However, CVWD's system has the capacity to increase treatment capabilities as population grows.

Recycled wastewater is used for groundwater replenishment and for outdoor irrigation. CVWD also delivers Colorado River water via the Coachella Canal for agricultural irrigation. CVWD maintains approximately 2,500 miles of on-farm drainage that conveys drained agricultural irrigation water to the Salton Sea. Two of the water reclamation plants (WRP 7 and WRP10) recycle an average of about 8 MGD for golf course and municipal irrigation. The recycled water distribution systems serve a total of 20 customer accounts through 31 miles of pressurized distribution pipelines. The main focus of the recycled water system is to provide non-potable water to golf courses, but also serve non-potable water to municipal buildings and homeowner associations (HOAs) for landscape irrigation.

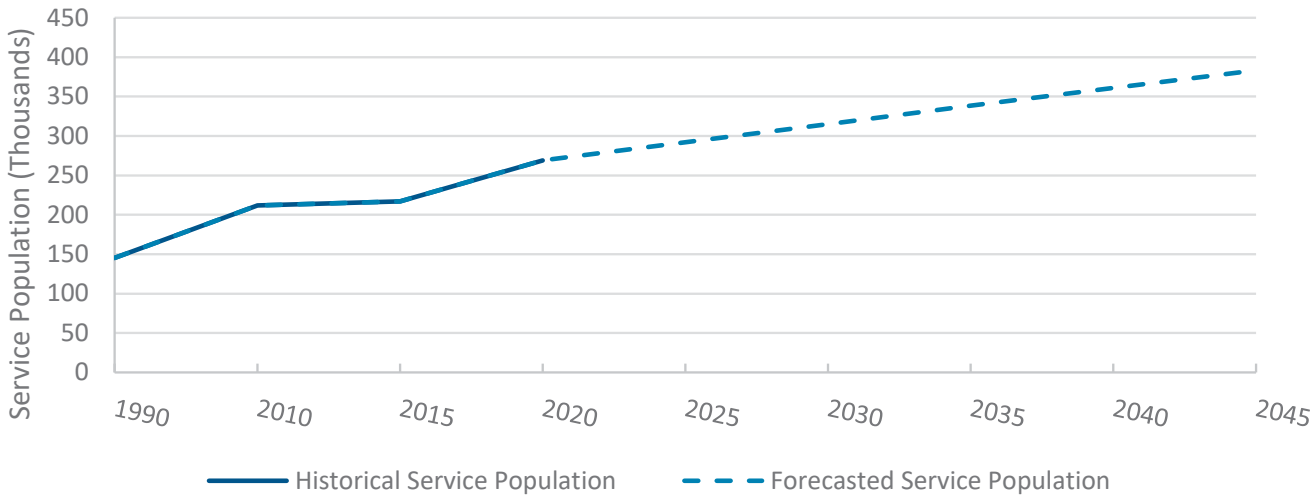
Stormwater Protection

CVWD provides regional flood protection for its stormwater unit within the Coachella Valley. CVWD's stormwater unit extends from the Whitewater River Groundwater Replenishment Facility in Palm Springs to Salton City, encompassing approximately 380,000 acres. CVWD's regional flood control system consists of a series of debris basins, levees, and stormwater channels that divert floodwaters from the canyons and alluvial fans surrounding the Coachella Valley to the 50-mile Whitewater River/Coachella Valley Stormwater Channel (CVSC) that flows to the Salton Sea.

CVWD Environmental Commitment and GHG Reduction History

CVWD's GHG emissions are primarily related to the purchase and consumption of electricity used for operations and wastewater treatment throughout the CVWD service area. Historically, CVWD's GHG emissions have remained relatively consistent. This is in part due to CVWD's reliance on local groundwater sources, and pumping similar amounts each year, such that there has been minimal variability in pumping needs and associated GHG emissions. However, future GHG emissions are anticipated to increase due to expansion of CVWD's services and increases in CVWD's service population estimated in the 2020 RUWMP.[2] As shown in Figure 1-3, service population is estimated to grow from approximately 268,952 in 2019 to 383,300 in 2045.[3] Impacts from the changing climate, such as increased frequency and severity of drought conditions, may impact local groundwater supplies and water quality, as well as the availability of imported water from the Colorado River. Prior to development of this CAAP, which is CVWD's first climate action planning document, CVWD has reduced its GHG emissions through the implementation of operational efficiencies, renewable energy projects, and water conservation programs into their services. Some of these efforts and the associated effects on reducing GHG emissions are summarized below.

Figure 1-3. Historical and Forecasted Service Population by CVWD



2. http://www.cvwd.org/DocumentCenter/View/5482/Coachella-Valley-RUWMP
3. http://cvwd.org/ArchiveCenter/ViewFile/Item/516

Infrastructure Energy Efficiency and Renewable Energy

Through Capital Investment and Annual Strategic Plans, CVWD has continually invested in projects and efforts to upgrade infrastructure and improve the energy efficiency of its operations. This has included energy audits and upgrades at WRPs to optimize energy use, as well as coordination with Southern California Edison for efficiency modifications.

CVWD has demonstrated commitment to energy efficiency improvements through the design of its facilities; for example, CVWD's Critical Support Services Building at its Palm Desert campus was designed in alignment with Leadership in Energy and Environmental Design (LEED) specifications.[4]

CVWD is continuing to develop new initiatives to further improve energy use at CVWD facilities. Current planning and operational efforts include: regularly auditing energy use and implement energy efficiency adjustments; incorporate time-of-use solar panels on parking structures; and installing a battery system for solar energy storage at the Palm Desert campus. With these improvements, a majority of all energy consumption at the Palm Desert campus may eventually be achieved through produced solar energy.

Water Conservation

Since 2009, CVWD has developed a number of water conservation programs to reduce urban water use and align with the State of California's requirement that all water providers reduce their water deliveries by 20 percent by 2020. CVWD provides funding, education, and engagement for multiple water conservation programs, including a rebate program for residential and commercial customers for turf conversion, smart irrigation controllers, and high efficiency/ low-flow appliances (e.g. toilets, washing machines). Additionally, CVWD has conducted water audit and leak detection monitoring programs for large water users. Since the start of the Leak Detection Program in 2013, approximately 1,406 miles of water main have been surveyed and approximately 137 million gallons of water have been saved. As part of the Golf Course Conservation Program, CVWD has assisted in the removal of 24 acres of turf from gulf courses to date, saving approximately 12 million gallons of water annually. Detailed descriptions of CVWD's water conservation efforts can be found online at *http://www.cvwd.org/31/Conservation*. The decrease in water consumption through water conservation efforts has the co-benefit of also reducing GHG emissions associated with the energy needs for water treatment and delivery.

4. *The Critical Support Service Building is not LEED certified, however was designed following LEED specifications.*





2. SCIENTIFIC CONTEXT FOR CLIMATE CHANGE

CLIMATE CHANGE CAUSES AND IMPACTS

This section provides an overview of the scientific context and forecasted impacts of climate change to CVWD's operations. Included are discussions of the greenhouse effect, GHG emissions data in California, CVWD's GHG emissions sources, and climate change impacts and vulnerabilities specific to CVWD's operations[5].

5 *This section relies on best-available science-based climate modeling projections for the Coachella Valley. As climate modeling is inherently uncertain, projections represent best estimates of a future climate and are not meant to serve as exact predictions.*

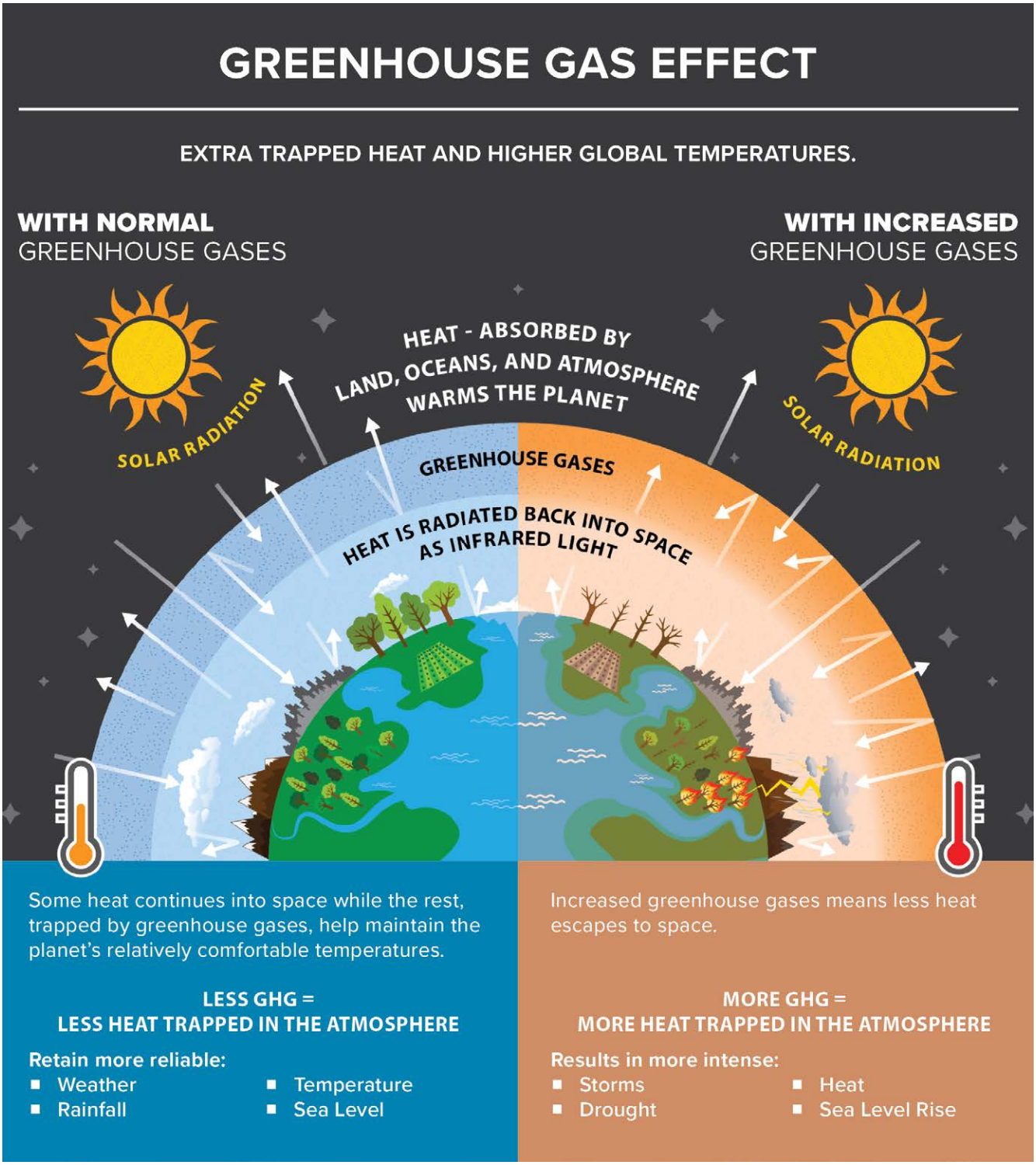
Greenhouse Effect and Emissions Sources

Greenhouse Effect

Most of the energy that affects the Earth's climate comes from the sun. When solar radiation reaches the Earth, some fraction is adsorbed by the Earth's surface and some is reflected back into space. Gases in the Earth's atmosphere act like a blanket reducing the amount of energy radiated back into space from Earth's surface resulting in heat being trapped within the atmosphere. This is known as the "greenhouse effect" because atmospheric gases function similar to the windows in a greenhouse, which trap the Sun's rays and create a much warmer space inside the greenhouse than the outside air. The greenhouse effect regulates the Earth's climate, maintaining conditions suitable for life on Earth. However, a rapid increase of GHG emissions can cause excess heat to be trapped, affecting global temperatures and climate. This process is depicted in Figure 2-1.



Figure 2-1. Greenhouse Gas Effect and Associated Climate Impacts[6]

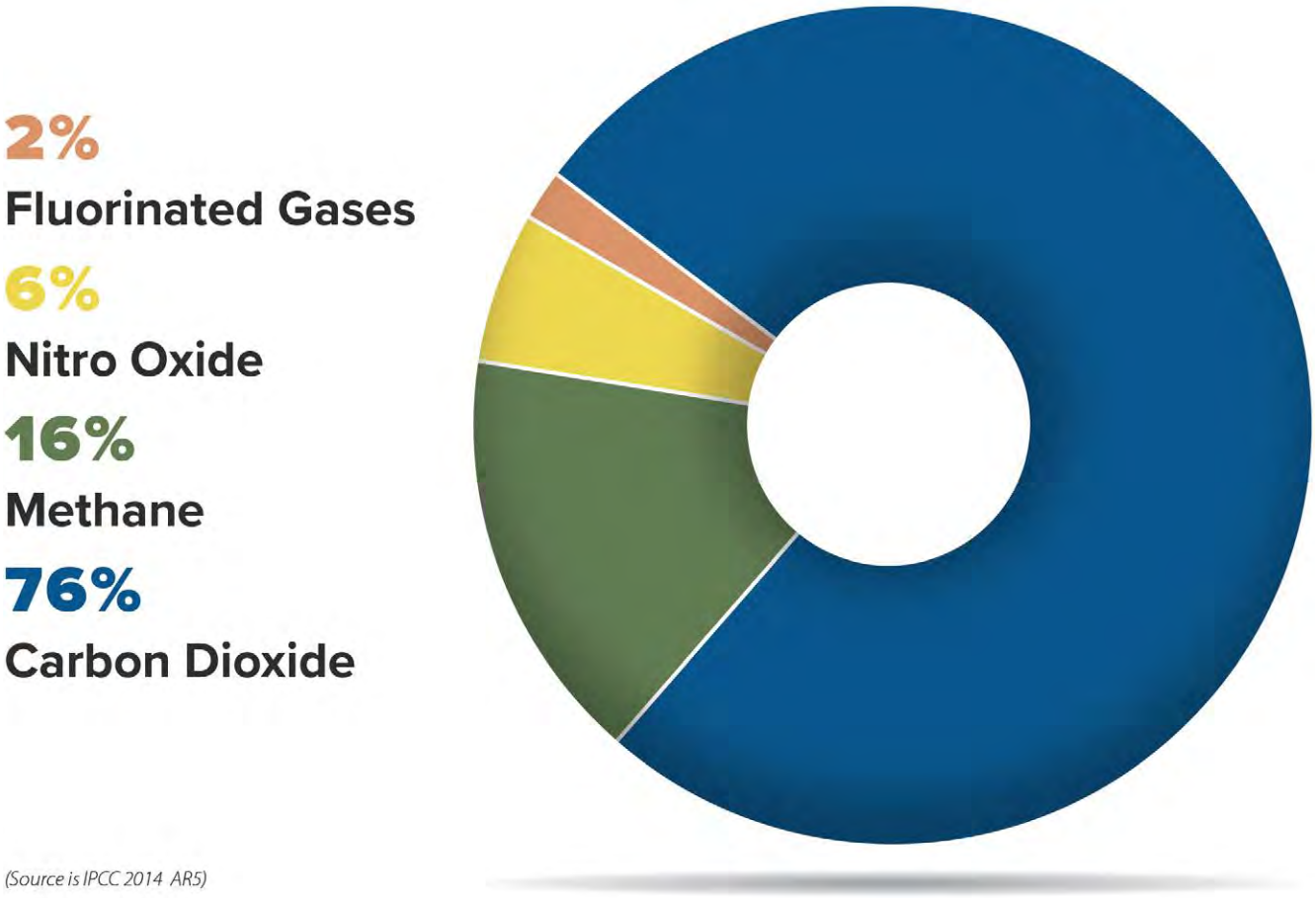


6 *Information in Figure 2-1 regarding the Greenhouse Effect was obtained from https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions*

Global Warming Potential

The primary GHGs that contribute to the greenhouse effect on Earth include carbon dioxide (CO_2e), methane (CH_4), and nitrous oxides (N_2O). These are also the primary GHG's contributed to the atmosphere by human activities, for example through the combustion of fossil fuels for energy, agricultural and industrial activities, and other processes. Of the GHG's contributed to the atmosphere by human activities, CO_2 makes up 76 percent of these emissions, CH_4 makes up 16 percent, N_2O makes up 6%. The remaining 2 percent of emissions arise from other GHG's called fluorinated gases.

Figure 2-2. GHGs from Human Activities



(Source is IPCC 2014 AR5)

Each GHG has its own global warming potential (GWP), which refers to the extent to which the GHG traps energy in the atmosphere.[7] The determination of a GHG's GWP utilizes CO_2 as a reference point, and compares the potential impact of different GHGs where CO_2 has a GWP of 1. Using the 100-year GWP values published in the International Panel on Climate Change (IPCC) *Fifth Assessment Report* (IPCC 2014), methane has a GWP of 28, meaning that each unit of methane causes 28 times more global warming potential than 1 unit of CO_2, while nitrous oxide has a GWP of 265.[8,9] Other GHGs include the fluorinated gases, which can have a GWP of up to 23,500. IPCC publishes Assessment Reports to update GWPs of several GHGs following advances in scientific knowledge on the radiative efficiencies and atmospheric lifetimes of GHGs. When individual GHGs are normalized based on their GWPs, we refer to them as carbon dioxide equivalents or CO_2e. Generally, GHG emissions are quantified in terms of metric tons (MT) CO_2e emitted per year. Figure 2-3 shows a comparison of the most common GHGs and their GWPs. While CO_2 has the lowest GWP of the GHGs, it is by far the largest contributor to climate change effects due to the total mass of CO_2 in the atmosphere.

Figure 2-3. Comparison of GHG GWPs



Source: https://climate.nasa.gov/evidence/

7 *According to the United States Environmental Protection Agency, the GWP was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide (EPA 2017).*

8 *International Organization for Standardization (ISO) published ISO 14064-1 in 2006 (revised 2018) to provide an international standard for the quantification and reporting of GHG emissions.*

9 *https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf*

GHG Emission Sources

Anthropogenic processes that release GHGs include: the burning of fossil fuels for transportation, heating, and electricity generation; agricultural practices that release methane, such as livestock grazing and crop residue decomposition; and industrial processes that release smaller amounts of high-GWP gases. Deforestation and land cover conversion also contribute to global warming by reducing the Earth's capacity to remove CO_2 from the air and altering the Earth's albedo,[10] or surface reflectance, allowing for absorption of additional solar radiation. According to the U.S. Environmental Protection Agency (USEPA), gross GHG emissions nationwide have increased by 1.3 percent since 1990. While the continued shift from coal to natural gas and increased use of renewables in the power sector helps to reduce GHG emissions, continued increases in population growth and industrialization can lead to further increases in GHG emissions unless technology and practices transition to low carbon alternatives.

CVWD GHG Emission Sources

CVWD's sources of GHG emissions include the following:

- Electricity usage to pump groundwater, conduct water quality sampling and treatment, provide water conveyance and distribution throughout the service area, and operate CVWD facilities such as pump stations, lift stations, water reclamation plants, and the Coachella and Palm Desert campuses;
- Combustion of fuels (such as natural gas) in buildings and stationary equipment, and during construction activities;
- Combustion of fuels (such as gasoline and diesel) for transportation (fleet vehicle and equipment internal combustion of fuel, and employee commutes);
- Emissions released from the processing and treatment of wastewater (e.g. methane from lagoons, nitrous oxide from nitrification or denitrification, and emissions in effluent discharge); and
- Waste emissions including combustion of fuels in waste collection vehicles and landfill equipment as well as emissions from the decomposition of waste at the landfill.

10 *Albedo refers to the amount of diffuse radiation of energy out of the total, ranging from 0 (a black body that absorbs all radiation) to 1 where no energy/radiation is absorbed. Source: National Snow & Ice Data Center (NSIDC). 2020. https://nsidc.org/cryosphere/seaice/processes/albedo.html*

Climate Change Impacts

Global Climate Change Impacts

Globally, climate change is linked to several changes which have potential to affect public health, natural resources, infrastructure, emergency response, tourism, and many other facets of society. Scientists have measured increasing global temperatures, warming oceans, shrinking ice sheets, less snow cover, sea level rise, and species extinction. Global climate change also has the potential to result in flooding of low-lying areas (due to sea level rise), reduction of fresh-water supply (due to rainfall and snowfall changes), adverse changes to biological resources and public health (due to increased temperature, less-productive habitats, and expansion of disease vectors), as well as many other adverse environmental consequences.[11]

Regional Climate Change Impacts

California has undertaken extensive research at the state and local levels in order to support state and local agencies on long-range planning and adaptation strategies to protect infrastructure and resources. The impacts of climate change from potential sea-level rise, changing weather patterns, extended drought, increased fire danger, and more severe storms have the potential to affect CVWD's infrastructure and water supply. By leveraging these studies as part of the climate action planning process, CVWD has identified potential climate vulnerabilities that may occur while also striving to reduce its GHG emissions. Potential vulnerabilities to climate change are presented in the following section to highlight possible impacts of climate change to CVWD's operations and infrastructure.

In the future, the most apparent effects of climate change in the southwestern United States, including the CVWD service area, will likely be more days of extreme heat and increased periods of drought, resulting in reductions in water supply availability. Additionally, the region could experience increased intensity and frequency of rain events which could lead to more damaging floods and debris flows, which could threaten CVWD infrastructure. Furthermore, the increased heat and reduced precipitation associated with climate change can increase fire danger, which may also threaten critical infrastructure.[12,13]

11 IPCC 2019–https://www.ipcc.ch/sr15/chapter/chapter-3/

12 https://19january2017snapshot.epa.gov/climate-impacts/climate-impacts-southwest_.html

13 https://www.nationalgeographic.com/science/2020/09/climate-change-increases-risk-fires-western-us/#close

CLIMATE CHANGE HAZARDS AND VULNERABILITIES AT CVWD

CVWD's water supplies include local groundwater and water allocations from the State Water Project (SWP) and the Colorado River. Imported water supply may be significantly impacted by climate change due to reduction in Sierra Nevada and Colorado River Basin snowpack volume resulting from higher temperatures and shorter winters; smaller snowpack results in decreased flows in the Colorado River and greatly impacts SWP sourced water. Although CVWD does not physically receive water from the SWP, prolonged drought occurrence in northern California due to climate change can impact the District if SWP allocations are reduced. Groundwater is impacted by climate change less directly and occurs more slowly than effects to surface water. Groundwater supplies are directly and indirectly impacted by prolonged droughts which often correlate with long-term overdrafting of groundwater basins, where more water is removed from a given basin than is naturally and manually replenished. The effects of overdraft include a declining water table and increasing depth-to-groundwater which can result in land subsidence and water quality degradation, such as increasing concentrations of total dissolved solids (TDS). The climate-related changes



that are expected to most directly impact CVWD include: reduced quality and availability of imported water; reduced groundwater replenishment; increased frequency and intensity of flooding events; increased risk of large wildfires and impacts on effected infrastructure; and increased temperatures and extreme heat events, each of which are described in more detail below. A 2020 report by the U.S. Geological Survey (USGS) concluded that efforts by CVWD to replenish local aquifers in the Coachella Valley have been effective, leading to stable land surface elevations in most of the Coachella Valley. Areas with land subsidence identified in prior studies are now stable, uplifting, or experiencing substantial slowing of subsidence. The USGS report identified three initiatives by CVWD that have been most effective in improving groundwater conditions in some of the historically most overdrafted areas of the valley. The initiatives are providing Colorado River water through the Mid-Valley Pipeline project since 2006 to reduce groundwater pumping; budget-based, tiered water rates in place since 2009 that have contributed to conservation; and aquifer replenishment at the Thomas E. Levy Groundwater Replenishment Facility since 2009. Historically, CVWD began importing water to the Coachella Valley in 1949 to help reduce groundwater pumping.[14,15]

14 https://www.cvwd.org/CivicAlerts.aspx?AID=354

15 https://pubs.er.usgs.gov/publication/sir20205093



Reduced Quality and Supply of Water from the Colorado River

Changing precipitation patterns are causing increased rain and decreased snowfall, which may reduce Sierra Nevada and Rocky Mountains spring snowpacks by as much as 65 percent by the end of the century.[16] The shift in precipitation coming as rain versus snow alters the runoff patterns and volume such that runoff occurs early in the season, limiting the amount of water stored in snowpack that has been historically relied on for use during peak needs in the summer months.

Without the natural storage provided by a deep snowpack, less water will be available through California's dry summer months. In addition, increasing rates of evapotranspiration due to increased temperature, in combination with a reduced snowpack, is projected to result in reduced Colorado River flows. One study from University of California, Santa Cruz, estimates that Colorado River flows will reduce 20 to 30 percent by mid-century, and 35 to 55 percent by the end of the century.[17] The Colorado River water delivered by the All American Canal, feeds into the 132-mile Coachella Canal branch which is operated by CVWD to meet water demands for irrigation and groundwater replenishment. A reduction in flow of the Colorado River could impact the allocations CVWD receives, thereby impacting CVWD water supply and ability to replenish the local groundwater basin. And it is important to note that CVWD holds senior water rights to Colorado River water.



16 *https://water.ca.gov/Programs/All-Programs/Climate-Change-Program/Climate-Change-and-Water*

17 *https://www.energy.ca.gov/sites/default/files/2019-12/Water_CCCA4-EXT-2018-006_ada.pdf*

Increased Frequency and Intensity of Floods

For the western U.S., such as Southern California where the CVWD service area is located, precipitation and flooding patterns are greatly impacted by the El Niño – Southern Oscillation (ENSO) Cycle. ENSO is the nomenclature used to describe the climate phenomenon consisting of an oscillating warming and cooling pattern of the ocean surface in the central and eastern tropical Pacific Ocean. El Niño describes a warmer than normal sea temperatures in the equatorial Pacific while Southern Oscillation describes the large-scale change in atmospheric pressure across the eastern equatorial Pacific and Indo-Australian areas. During the El Niño cycle, precipitation increases and results in wet winters, which in turn result in increased occurrence of floods and landslides. These effects have been observed recently throughout Southern California, including within CVWD's service area. Climate change is projected to further intensify the ENSO cycles, such that though overall precipitation may be decreasing, the intensity of rain events will be greater resulting in greater risk of floods, debris flows, and landslides. Further, increased heat and temperature in the Coachella Valley can also result in soils becoming hydrophobic, reducing rainfall infiltration rates and leading to increased runoff and flooding when precipitation is heavy. Increasing development in Coachella Valley with more impervious surfaces further exacerbates flooding issues due to decreased infiltration and attenuation, leading to increased runoff volumes and velocities. Over the last 18 years, CVWD has reported 52 flood occurrence and is considered to be vulnerable to future flooding events.[18] Flooding events can be destructive towards infrastructure, affect soil characteristics and ability to support agricultural activities, and can result in contamination of wells and reservoirs due to bacteria and chemicals present in surface water runoff.

CVWD provides regional flood protection for its stormwater unit within the Coachella Valley. CVWD's stormwater unit extends from the Whitewater River Groundwater Replenishment Facility in Palm Springs to Salton City, encompassing approximately 380,000 acres. CVWD's regional flood control system consists of a series of debris basins, levees, and engineered stormwater channels that divert floodwaters from the canyons and alluvial fans surrounding the Coachella Valley to the 50-mile Whitewater River/Coachella Valley Stormwater Channel (CVSC) that flows to the Salton Sea.

18 *http://www.cvwd.org/DocumentCenter/View/4288/2019-Coachella-Valley-Hazard-Mitigation-Plan—-Draft-PDF?bidId=*

The Whitewater River Stormwater Channel is a regional flood control channel, originating in north Palm Springs. The Coachella Valley Stormwater Channel is an engineered extension of the Whitewater River Stormwater Channel [originating in La Quinta and flowing downstream to the Salton Sea]; and which serves subsurface drains on agricultural lands and conveys treated wastewater and urban and storm-water runoff. This 50-mile stormwater conveyance channel is routinely operated and maintained by CVWD.

Increased Risk of Wildfires

Wildfires in the grasslands and chaparral ecosystems of Southern California are estimated to increase by approximately 30 percent toward the end of the 21st century. This is because increases in winter rain will stimulate the growth of more vegetation that will act as fuel in the summer and autumn months, when higher temperatures will increase wildfire risk. While the central valley region of CVWD's service area is less susceptible to wildfires, the mountainous lands that border the edges of the District are at the highest risk of wildfires. For CVWD, the greatest risk from increased wildfires is damage to infrastructure including above ground assets and flooding. Wildfires can exacerbate flooding events if heavy rainfall were to follow a fire event, due to hydrophobic soil conditions that can develop as a result of the gases which condense and form a waxy coating from the combustion of vegetative materials and root systems. In addition, in the rainstorms following wildfires, ash, sediment, excess nutrients, and other contaminants may be transported by run-off or overland flow into downstream waterways.[19]



19 https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies

Increased Temperatures and Extreme Heat Events

California is expected to see an average annual temperature increase of 2.5°F by 2030, with inland areas expected to see the most extreme changes.[20] Evidence of increasing annual temperatures has already been documented.[21] California is projected to experience an increase in average annual temperature of 2.7°F by 2050.[22] According to current climate prediction models, California's average annual temperature increases could range from approximately 3.5°F to 11°F by the end of the century, relative to the annual average temperature for the 1961–1990 time period. In addition, the number of extreme heat days in Southern California are expected to increase from an average of four per year based on historical data between 1961 -1990, to approximately 53 in 2050 and up to approximately 99 in 2100.[23] In this context, "extreme heat days" are defined as days with temperatures above the 98th percentile of computed maximum temperature by 2050. Cal-Adapt, the state's web-based climate adaptation planning tool, projects that the Coachella Valley will experience up to 42 extreme heat days between 2070—2099; this increase from an average of four extreme heat days per year is shown in Figure 2-5.[24] Extreme heat can degrade water quality due to eutrophication[25] and cause increased evapotranspiration[26] thereby decreasing flow. Extreme heat may also increase water demand pressure from customers of certain industries such as for agricultural or other irrigation needs.



20 https://cal-adapt.org/tools/annual-averages/

21 https://www.climate.gov/news-features/event-tracker/extreme-overnight-heat-california-and-great-basin-july-2018

22 https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

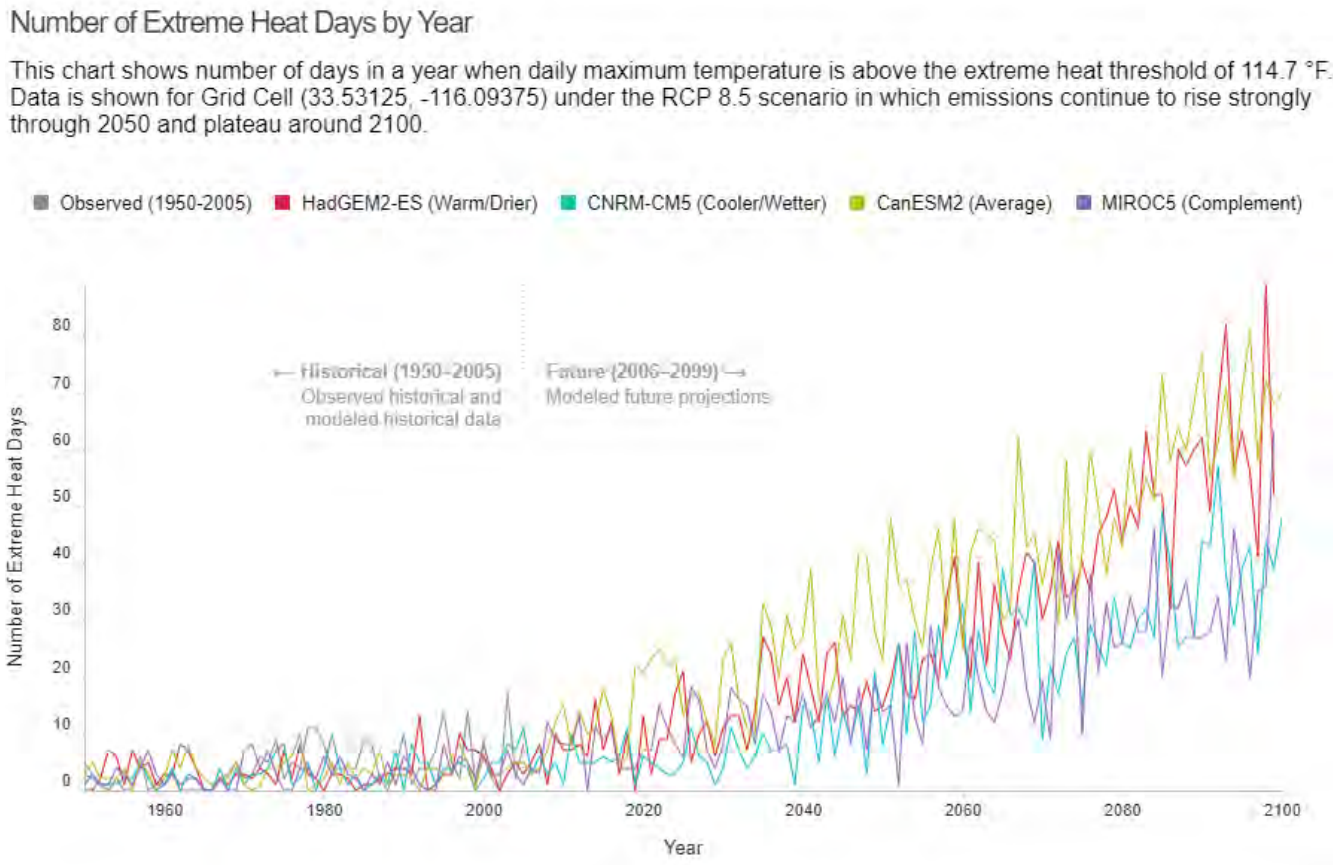
23 https://www.opr.ca.gov/facts/climate-change-and-public-health.html

24 https://cal-adapt.org/tools/extreme-heat/#climatevar=tasmax&scenario=rcp85&lat=33.53125&lng=-116.09375&boundary=locagrid&units=fahrenheit

25 Eutrophication is the gradual increase in the concentration of nutrients, such as phosphorus and nitrogen, in the aquatic ecosystem leading to excessive growth of algae or plankton. The excessive growth can deplete oxygen levels in the water causing plant and animal death.

26 Evapotranspiration is the process of water evaporation from the soil and by plant transpiration.

Figure 2-5. Historical and Project Extreme Heat Days in Coachella Valley



- Source: Cal-Adapt. Data: LOCA Downscaled CMIP5 Projections (Scripps Institution of Oceanography), Gridded Observed Meteorological Data (University of Colorado, Boulder).
- Four models have been selected by California's Climate Action Team as priority models for research contributing to California's Fourth Climate Change Assessment (Pierce et al., 2018). Projected future climate from these four models can be described as producing:
  - A *warm/dry* simulation (HadGEM2-ES)
  - A *cooler/wetter* simulation (CNRM-CM5)
  - An *average* simulation (CanESM2)
  - The model simulation that is most unlike the first three for the best coverage of different possibilities (MIROC5)

CVWD HAZARD MITIGATION PLAN

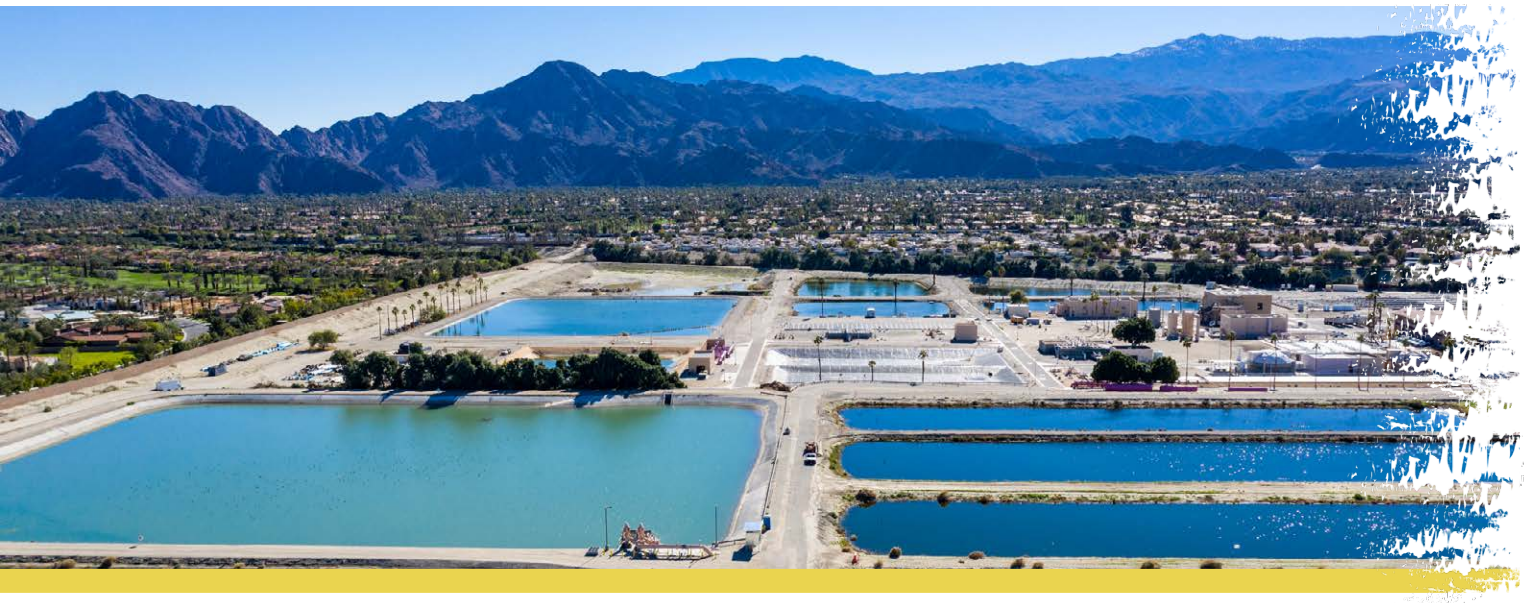
Climate change presents numerous challenges for our region. To address these challenges, CVWD's HMP evaluates hazards that threaten CVWD as they relate to climate change; the HMP also provides an assessment of existing plans and actions that are in place to address the effects of climate change, and sets up broad mitigation strategies and measures to address CVWD's vulnerabilities to the effects of climate change. In recent years, CVWD has also included climate change evaluation as a component of future scenario planning and in hazard identification. The IRWM & SWR Plan evaluates various future scenarios for water supply availability based on the effects of climate change.

Some of the climate change vulnerabilities addressed in the aforementioned plans include increases in the frequency, duration, and severity of drought and rising temperatures that threaten the reliability of CVWD's regional water supply.

CVWD's mission is to provide a reliable supply of high-quality water at a reasonable cost; and as it relates to climate change, meeting this mission statement requires CVWD be prepared to adapt to changing climactic conditions. The measures identified in this CAAP support CVWD's efforts to prepare for these future changes and align with mitigation strategies identified in the HMP, while also facilitating CVWD's ability to deliver its mission statement.







3. GHG EMISSIONS INVENTORY AND FORECAST

CVWD OPERATIONAL BOUNDARY AND EMISSION SOURCES

As part of the CAAP development process, a multi-year inventory of GHG emissions was prepared for CVWD operations between 2016 and 2019. The inventory provides a measurement of GHG emissions associated with the operation and maintenance of CVWD's infrastructure, including its buildings, facilities, fleet, and non-stationary equipment, as well as emissions from construction, waste streams, and employee commute.

Conducting a GHG inventory is an important component of the CAAP development

process, as it allows CVWD and its stakeholders to understand which activities contribute substantially to their GHG emissions footprint, and provides the groundwork for forecasting future GHG emissions and developing GHG emissions reduction targets.

The inventory of CVWD's GHG emissions is consistent with standard reporting protocols from the World Resources Institute (WRI), World Business Council for Sustainable Development (WBCSD), and the International Council for Local Environmental Initiatives (ICLEI). The WBCSD and WRI's *Corporate Standard GHG Protocol* requires that an inventory quantify emissions from all GHG-generating activities that fall under some level of the entity's operational control. GHG-generating activities are therefore categorized into three "scopes" which describe three levels of operational control.

SCOPE 1 consists of activities that are directly controlled by the organization

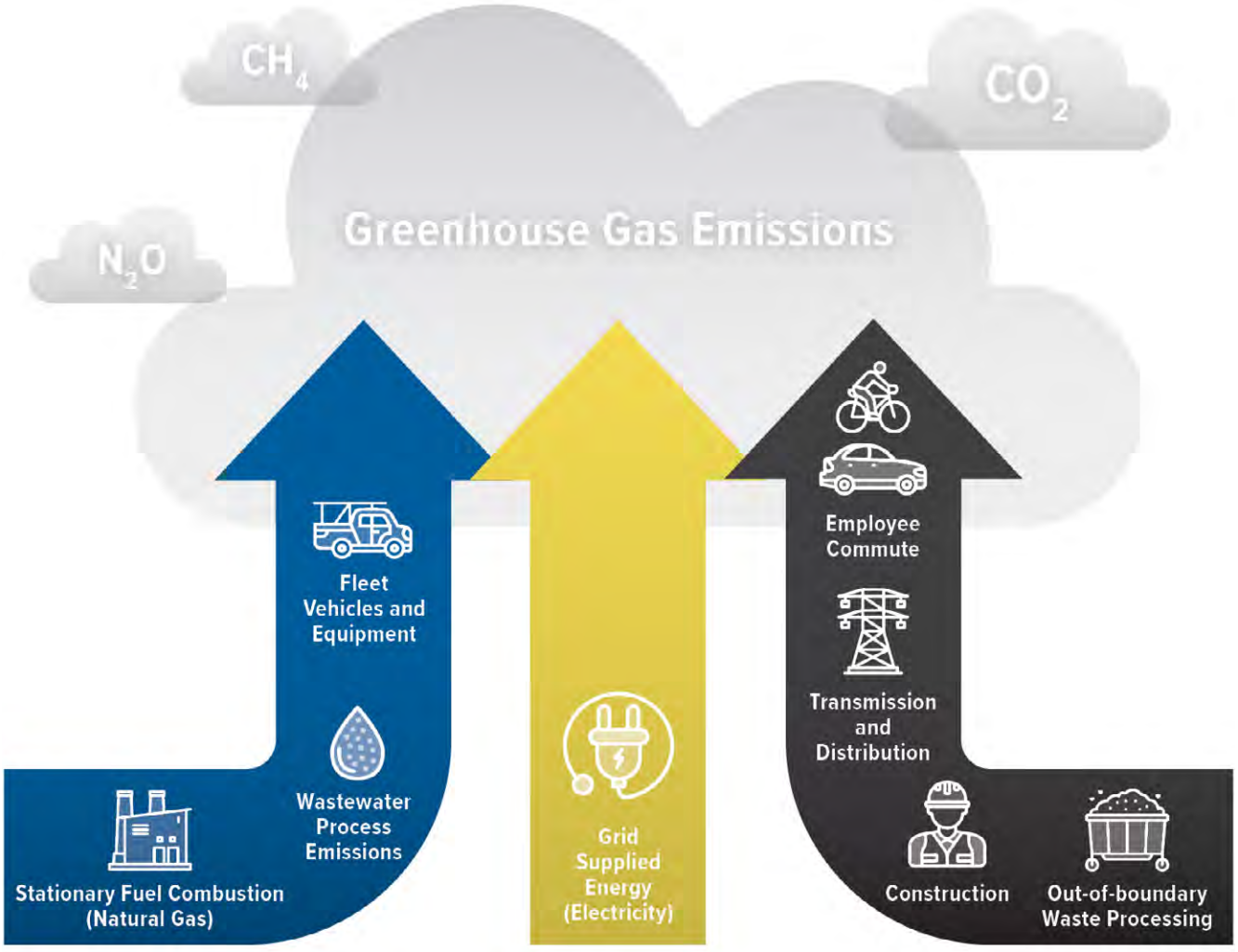
SCOPE 2 consists of activities associated with the consumption of purchased electricity[28]

SCOPE 3 consists of all other activities not covered under Scope 2 that are not directly controlled by the organization but are fundamental to the organization's operation

CVWD's GHG-generating activities that were included in the inventory are shown categorized by scope in Figure 3-1. These activities include natural gas combustion, wastewater process emissions, vehicle fleet and equipment usage, electricity usage, out-of-boundary waste processing[29], construction projects, electricity transmission and distribution,[30] and employee commute.

28. *Use of purchased electricity is considered an indirect GHG-generating activity, as the emissions from electricity are not generated on site, but are a direct result of activities under CVWD control.*
29. *Out-of-boundary waste processing includes emissions associated with combustion of fuel for collecting and transporting waste to a landfill, fuel combustion for landfill equipment, and waste decomposition emissions once landfilled.*
30. *Electricity usage is usually associated with some amount of transmission and distribution losses as a result of moving electricity from the location where it was generated to the facility where it is used. These out-of-boundary emissions are captured in the inventory as a Scope 3 activity.*

Figure 3-1. CVWD's GHG Emissions by Scope



SCOPE 1
DIRECT EMISSIONS

GHG emissions generated by activities directly controlled by CVWD.

SCOPE 2
INDIRECT EMISSIONS

GHG emissions associated with production of CVWD's electricity, outside of CVWD's direct control.

SCOPE 3
OTHER INDIRECT EMISSIONS

GHG emissions associated with all other activities required for CVWD operations, outside of CVWD's direct control.

(CO_2 = Carbon dioxide | CH_4 = Methane | N_2O = Nitrous oxide)

Conducting the multi-year inventory for CVWD consisted of collecting summary data on each GHG-generating activity shown in Figure 3-1 for each year from 2016-2019, then converting the collected data to GHG emissions using science-based GHG emissions factors. GHG emissions inventories report GHG emissions in MT CO_2e. One MT is equivalent to 2,205 pounds. As a point of comparison, the average passenger car generates one MT CO_2e by driving from Palm Springs, California to Atlanta, Georgia.

Water districts can produce fluctuating GHG emissions year to year depending on the source of water delivered and the extent of water deliveries and wastewater treatment services provided, and other relevant operational fluctuations. To address this variability, CVWD elected to conduct a multi-year inventory rather than a single-year inventory. This multi-year inventory captures some of the year-to-year variability and provides an understanding of CVWD's GHG emissions over a broader time period. Details on the data sources and methods used to develop the multi-year inventory are included in Appendix A.



CVWD'S CURRENT GHG EMISSIONS

The results of the multi-year GHG emissions inventory for CVWD are shown in Table 3-1. A four year average is presented in Table 3-1 that best characterizes CVWD annual emissions over this time period. CVWD's major sources of emissions are electricity usage (53 percent of total emissions on average), wastewater treatment processing (32 percent of total emissions on average), and construction (eight percent of total emissions on average). All other sources were less than five percent of total emissions. These results show a trend of decreasing GHG emissions since 2016, primarily due to decreasing GHG emissions from electricity. Emissions reductions from electricity were primarily driven by an increase in carbon free electricity procured by CVWD's electricity providers in response to California's Renewable Portfolio Standard (RPS), which has reduced emissions in the electricity sector since 2016.[31]

Table 3-1. CVWD GHG Emissions Inventory

GHG-generating Activity	Scope	2016	2017	2018	2019	4-Year Average	Average % Contribution to Total
Vehicle Fleet and Equipment	Scope 1	3,523	3,675	3,674	3,617	3,622	5%
Natural Gas	Scope 1	104	97	95	124	105	0.2%
Wastewater	Scope 1	22,853	22,241	21,948	20,806	21,962	32%
Electricity	Scope 2	37,112	39,710	32,039	29,927	34,697	51%
T&D Losses	Scope 3	1,570	1,680	1,538	1,436	1,556	2%
Employee Commute	Scope 3	504	471	471	438	471	1%
Waste	Scope 3	13	21	21	29	21	<0.1%
Construction	Scope 3	5,448	5,448	5,448	5,448	5,448	8%
Total in Metric Tons		**71,127**	**73,342**	**65,234**	**61,825**	**67,882**	**100%**

Note: Values have been rounded and may not add up exactly.

31. *California's RPS requires all retail electricity providers in California to procure 50 percent of their electricity supply from carbon-free resources by 2026, 60 percent by 2030, and 100 percent by 2045. This will effectively reduce the GHG emissions intensity of electricity across the state, including the electricity CVWD purchases from Southern California Edison (SCE) and Imperial Irrigation District (IID).*

Similar trends are demonstrated in regards to GHG emissions from CVWD's inventory, shown by sector in Figure 3-2. GHG emissions by scope (1- direct emissions, 2- indirect emissions, and 3- indirect emissions) are shown in Figure 3-3.

Figure 3-2. CVWD GHG Emissions Inventory by Source

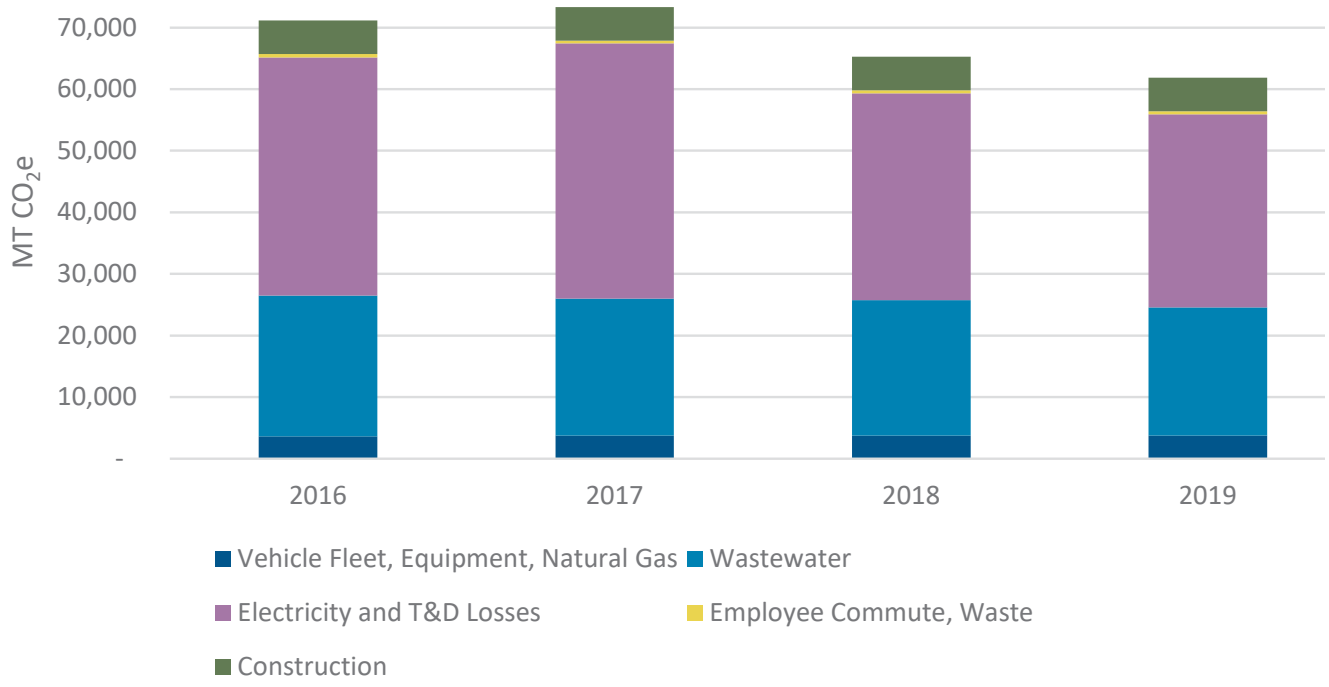
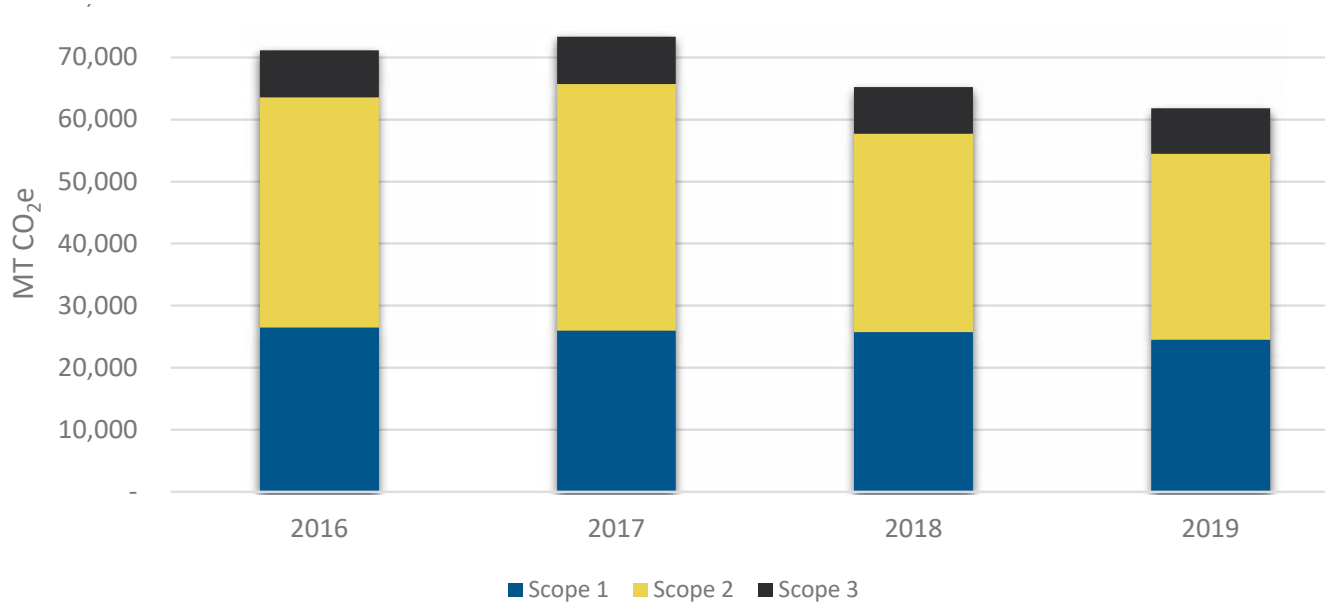


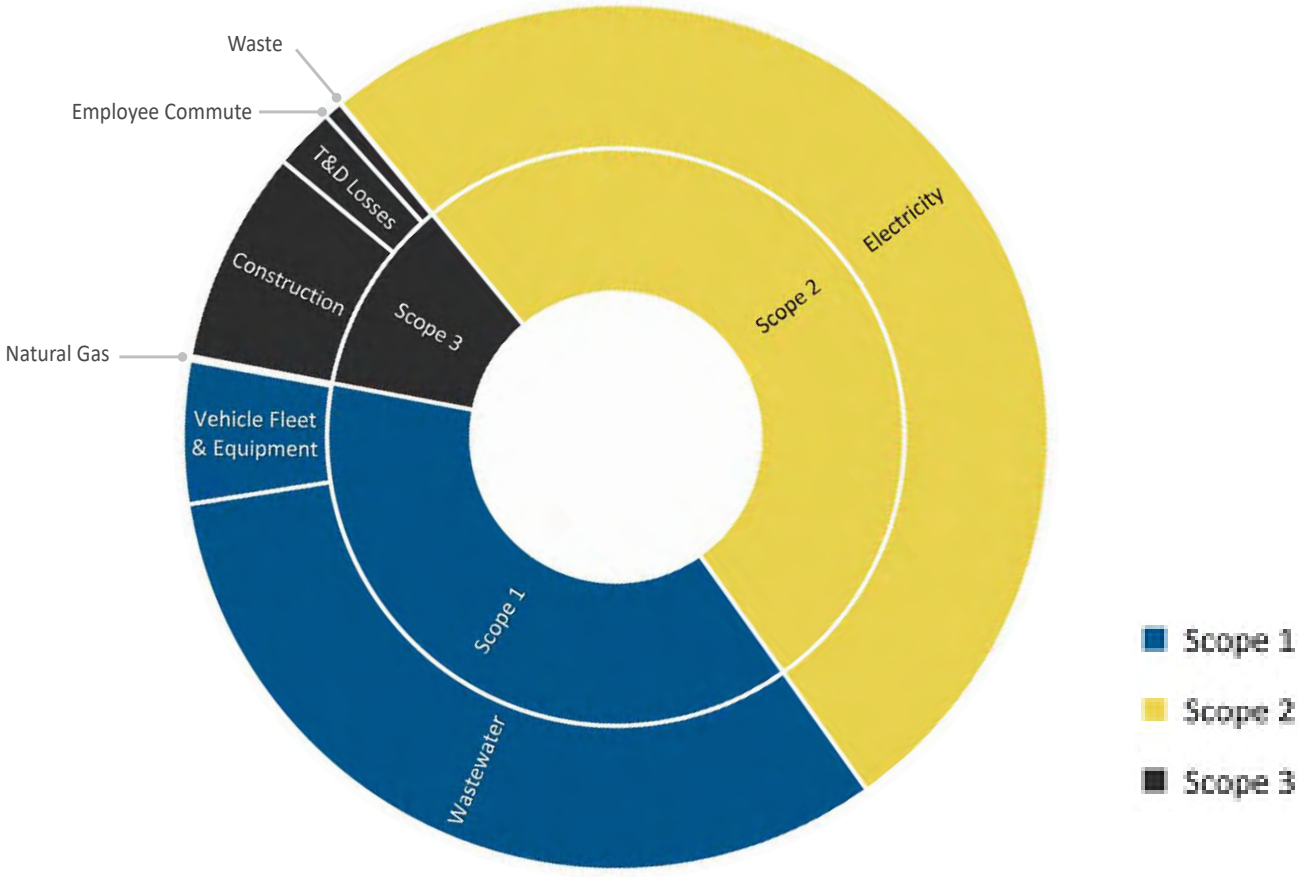
Figure 3-3. CVWD GHG Emissions Inventory by Scope



GHG Emissions by Scope

The majority of GHG emissions occur under Scope 2 (51 percent of total emissions on average), and Scope 1 (38 percent of total emissions on average), followed by Scope 3 (11 percent of total emissions on average). As such, the largest portion of GHG emissions generated by CVWD (i.e., Scope 1 and Scope 2 emissions) are under CVWD's operational control. The largest source of emissions – Scope 2 emissions associated with electricity usage – will continue to decrease over time as electricity sources become carbon free due to the California's RPS. Figure 3-4 shows CVWD's GHG emissions by scope (inner ring), and each associated sector (outer ring).

Figure 3-4. CVWD GHG Emissions Inventory by Scope and Sector



Note: Some GHG emissions sectors are too small relative to the overall emissions for labels to be visible on this graph including natural gas combustion (Scope 1), waste and employee commute (Scope 3).

SCOPE 1: Direct Emissions

CVWD's Scope 1 GHG emissions include emissions from vehicle fleet and equipment, combustion of natural gas in CVWD facilities, and wastewater treatment. Wastewater treatment is the largest contributor to Scope 1 (85 percent), followed by vehicle fleet and equipment (14 percent), and natural gas (0.4 percent). Scope 1 emissions have remained relatively steady between 2016 and 2019.

SCOPE 2: Indirect Emissions

Scope 2 GHG emissions are 100 percent attributable to electricity purchased from Souther California Edison (SCE) and Imperial Irrigation District (IID) and used by CVWD for its buildings and facilities. CVWD uses electricity primarily for well pumping, water reclamation, and agricultural irrigation. Scope 2 emissions have decreased between 2016 and 2019 due to the increased requirements for carbon free electricity procurement on SCE and IID from California's RPS.

SCOPE 3: Other Indirect Emissions

Scope 3 GHG emissions include electricity transmission and distribution (T&D) losses, employee commuting, waste disposal, and construction. Construction is the largest contributor to Scope 3 (74 percent), followed by T&D losses (21 percent), employee commute (six percent) and waste disposal (0.3 percent). Scope 3 emissions have remained relatively steady between 2016 and 2019.

HISTORICAL CVWD GHG EMISSIONS

The GHG emissions inventory helps CVWD and its stakeholders understand the relative magnitude of GHG emissions arising from each GHG-generating activity associated with CVWD's current operations. This inventory also aided in the development of CVWD's GHG emissions targets. As described in Section 1, the State of California has adopted SB 32, which requires the State of California to reduce its GHG emissions 40 percent below 1990 levels by 2030. Calculating this target for CVWD requires an estimate of CVWD's 1990 emissions levels, because CVWD does not have a GHG emissions inventory for 1990. The methods used to develop a back-cast to CVWD's 1990 emissions levels is described in the following section. CVWD's adopted emissions tar- gets are based on 1990 levels and are dis- cussed in more detail in Section 4.



Back-cast to 1990

To aid in determining CVWD's 2030 GHG emissions target, a back-cast of GHG emissions to 1990 was developed based on the earliest inventory results available for CVWD – the 2016 inventory results. The 1990 back-cast assumes that CVWD's emissions have followed approximately the same trajectory as the state's emissions such that for a given year, emissions for CVWD and the state have increased or decreased approximately the same percentage relative to 1990. For example, the state experienced an almost eight percent decrease in GHG emissions between 1990 and 2016; therefore, CVWD's 1990 emissions were assumed to be about eight percent higher than the 2016 emissions levels quantified in the 2016 GHG emissions inventory. Table 3-2 shows this calculation in more detail.

Table 3-2. CVWD's 1990 GHG Emissions Back-cast

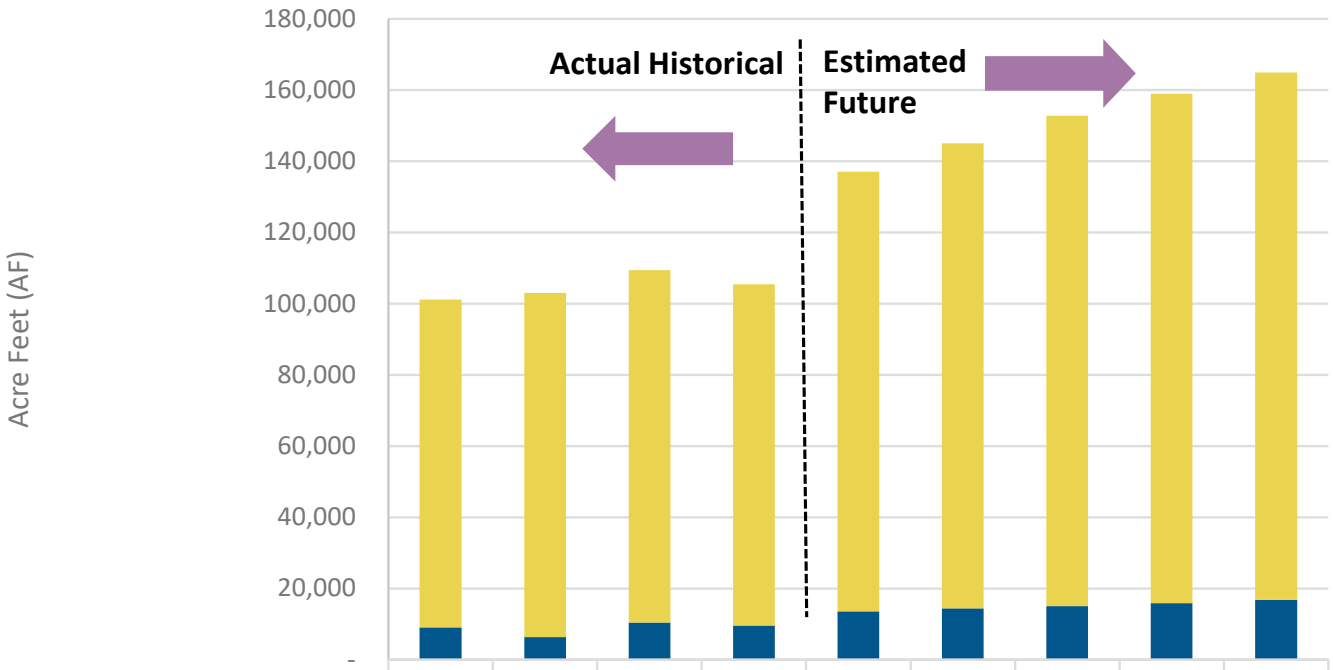
GHG Emissions	Total
State of CA 1990 Emissions (MMT CO_2e)	311.7
State of CA 2016 Emissions (MMT CO_2e)	287.9
1990 Change Factor (%)	(7.64%)
2016 CVWD Emissions (MT CO_2e)	71,126.95
1990 CVWD Emissions (MT CO_2e)	76,557.88

Notes: State-level GHG emissions values used for the 1990 back-cast were sourced from CARB (2007 and 2016), and exclude emissions from the industrial, agricultural, and high-GWP emissions sectors, for better comparison to CVWD's 2016 emissions inventory, which also excludes these sectors.

CVWD GHG EMISSIONS FORECAST

Using the 2016-2019 inventory, future operational GHG emissions were forecasted for CVWD. The forecast provides an estimate for how CVWD's GHG emissions will look in the future, based primarily on projected services over time. These projections were derived from CVWD's RUWMP. For example, electricity usage by CVWD is expected to increase in future years consistent with increased groundwater pumping and recycled water operations. This forecast allows CVWD to estimate how GHG emissions will change based on expected water demand, and how much CVWD will need to reduce emissions in order to meet GHG reduction targets for 2030 and 2045. Historical and projected water demand[32] is shown in Figure 3-5. Total water demand is expected to increase by roughly 50% between now and 2045, in accordance with projected population growth in CVWD's service area.

Figure 3-5. Historical and Projected Water Demand



	2016	2017	2018	2019	2025	2030	2035	2040	2045
Potable Water Demand (AF)	92,088	96,715	98,962	95,772	123,461	130,582	137,629	143,081	148,166
Recycled Water Demand (AF)	9,106	6,360	10,412	9,658	13,600	14,400	15,100	15,900	16,800

32. *Projected water deliveries were used as a proxy for all CVWD's future services, with the assumption that CVWD operations scale approximately with water delivery to customers.*

In order to clearly demonstrate how CVWD's emissions will look in the future, two forecasts were developed – a business-as-usual (BAU) forecast, and an adjusted forecast. The BAU forecast shows what CVWD's emissions would look based on water delivery projections alone. The adjusted forecast adjusts the BAU forecast to account for state-level implementation of policies and programs that will help California reduce its emissions through 2045. For CVWD, the adjusted forecast includes the California RPS, which will significantly reduce CVWD's GHG emissions from electricity through 2045.

Incorporating state-level policies and programs in the adjusted forecast creates a more realistic picture of what CVWD's emissions will look like in the future. The BAU forecast is useful for comparison with the adjusted forecast, to show the extent to which state-level policies and programs will help to reduce GHG emissions at CVWD (Figure 3-6). The numerical results of the forecast are included in Table 3-3. Details on the data sources and methods used to develop the forecast are included in Appendix A.

Figure 3-6. CVWD GHG Emissions Forecast

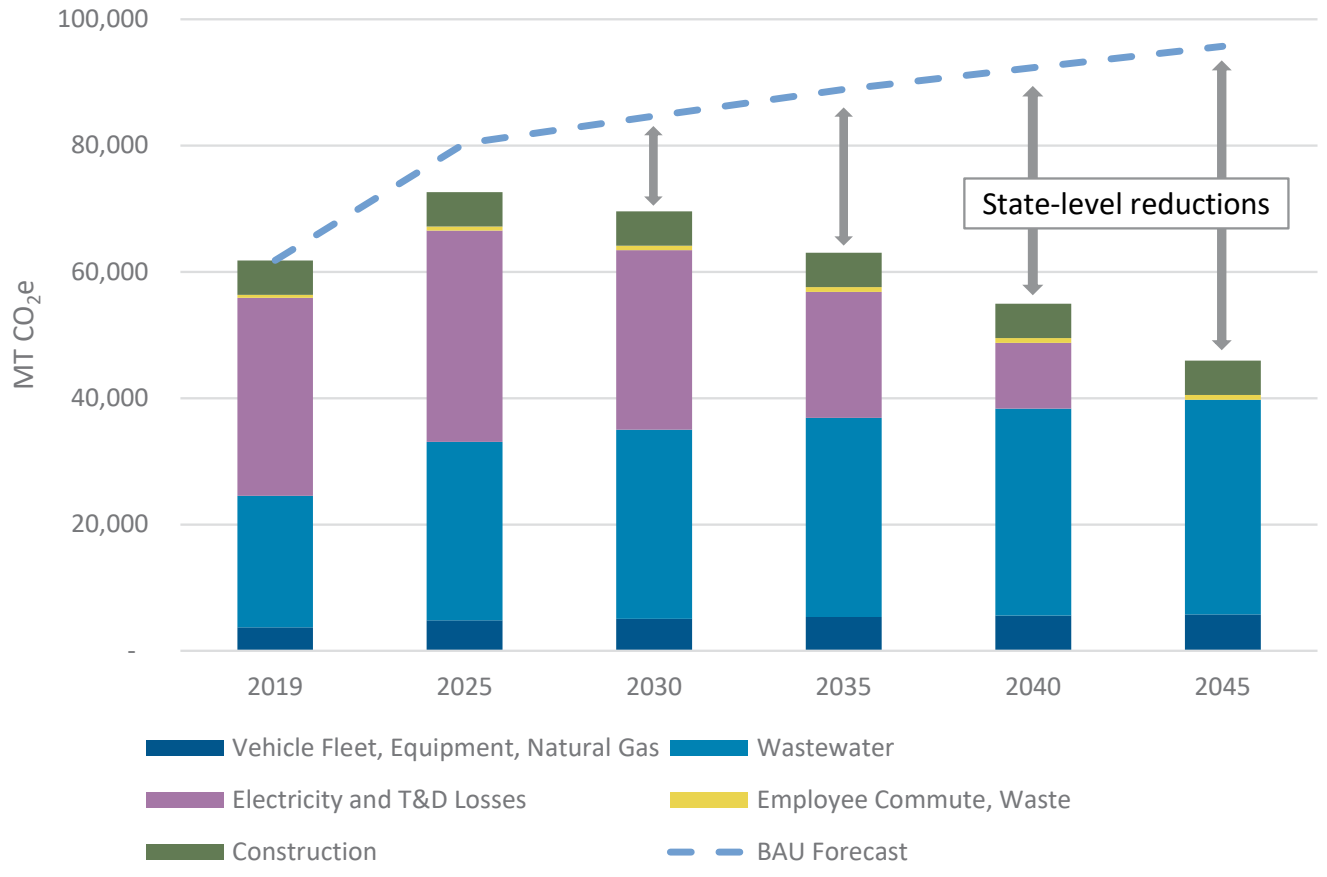


Table 3-3. CVWD GHG Emissions Forecast

Emissions Source	2025	2030	2035	2040	2045
Forecast Summary (MT CO_2e)					
BAU Forecast	80,351	84,684	88,898	92,365	95,720
Adjusted Forecast	72,484	69,425	62,862	54,802	45,781
Legislative Reductions	7,867	15,259	26,036	37,563	49,939
Adjusted Forecast Detail (MT CO_2e)					
Vehicle Fleet and Equipment	4,665	4,935	5,201	5,407	5,599
Natural Gas	135	143	151	156	162
Wastewater	28,308	29,941	31,557	32,807	33,973
Electricity	32,055	27,263	19,129	9,979	0
T&D Losses	1,374	1,168	821	427	0
Employee Commute	607	642	677	704	729
Waste	26	28	29	31	32
Construction	5,448	5,448	5,448	5,448	5,448

Note: Values have been rounded and may not add up exactly.


GOLF
CART
XING



4. CLIMATE ACTION TARGETS

INTERNATIONAL CONTEXT

Climate change is a global phenomenon and a major driver for GHG reduction activities which have continued to evolve on the international level. The United Nations Framework Convention on Climate Change (UNFCC) is an international environmental treaty, signed by 154 states at the United Nations Earth Summit in June 1992. The Framework established responsibilities for participating countries to reduce their anthropogenic emissions and return to 1990 emissions levels. The treaty was superseded in 2016 by the Paris Agreement, which established a goal to keep the rise in global average temperatures below 2°C with efforts to limit increases to 1.5°C by reducing global GHG emissions to carbon neutrality by mid-century.[33] The Paris Agreement has been ratified by 191 members of the UNFCC.[34]

33 https://www.ipcc.ch/sr15/

34 https://unfccc.int/process/the-paris-agreement/status-of-ratification

To assist in achieving these ambitious goals, the United Nations developed Sustainable Development Goals (SDGs) intended to be achieved by the year 2030. The SDGs are a collection of 17 interlinked global goals designed to guide sustainable development. These international frameworks have become the drivers for many of California's own climate related legislation.

CLIMATE ACTION AT THE STATE LEVEL

California has become a global leader in climate change action, having established extensive legislation, policies, and programs to reduce GHG emissions within the state over the last ten years. The primary drivers of climate action at the state level are AB 32, SB 32, and EO B-55-18. These regulations chart a path towards a carbon neutral[35] California by 2045, as explained below.

- **AB 32:** Codified the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires the California Air Resources Board (CARB) to prepare a Scoping Plan that outlines the main strategies the state will employ to meet the 2020 target. The AB 32 Scoping Plan was adopted in 2014.
- **SB 32:** The successor to AB 32 and requires the state of California to achieve a statewide reduction in GHG emissions of 40% below 1990 levels by 2030. The SB 32 Scoping Plan was adopted in 2017.
- **EO B-55-18:** Established a new statewide goal of achieving and maintaining carbon neutrality as soon as possible, and no later than 2045. Executive orders have not been codified by the state but are binding for state agencies and must therefore be addressed by qualified GHG reduction plans.

Programs and policies that support the goals established in the above bills and which will impact GHG emissions for CVWD include the California RPS, which, through SB 100, requires electricity providers to procure 100% renewable electricity by 2045. A full list of relevant state-level legislation is included in Appendix B.

35 *Carbon neutrality refers to achieving net-zero CO_2e emissions, such that any GHG emissions created are offset by GHG emissions sequestering activities*

CVWD CLIMATE ACTION TARGETS

While CVWD is not beholden to the AB 32, SB 32, or EO B-55-18, and currently faces no legislative requirements to reduce their GHG emissions, the state recognizes water agencies as one of the largest contributors to energy emissions in California.[36] It is also anticipated that as California works towards the 2045 carbon neutrality goal, additional legislation and regulations will be established in the future that will could require CVWD to adopt low-carbon practices and operations. As part of the process of developing a CAAP, CVWD has elected to establish climate action targets that align with the state's to serve as goals for CVWD's operations going forward and provide a framework for achieving voluntary GHG emissions reductions in future years.

This CAAP establishes a climate action tar- get for 2030 and a long-term GHG emissions goal for 2045. The 2030 target aligns with SB 32; the 2045 goal aligns with EO B-55-18.3 Per recommendations by the California Air Resource Board (CARB),[36] CVWD has adopted climate action targets on a per-capita basis, which focuses on GHG emissions reductions per person in CVWD's service population. CVWD's climate action targets are shown in Table 4-1. Figure 4-1 also shows the BAU forecast, adjusted forecast, and the 1990 baseline inventory back cast from the 2016 inventory as shown in Section 3 and described in further detail in Appendix A.



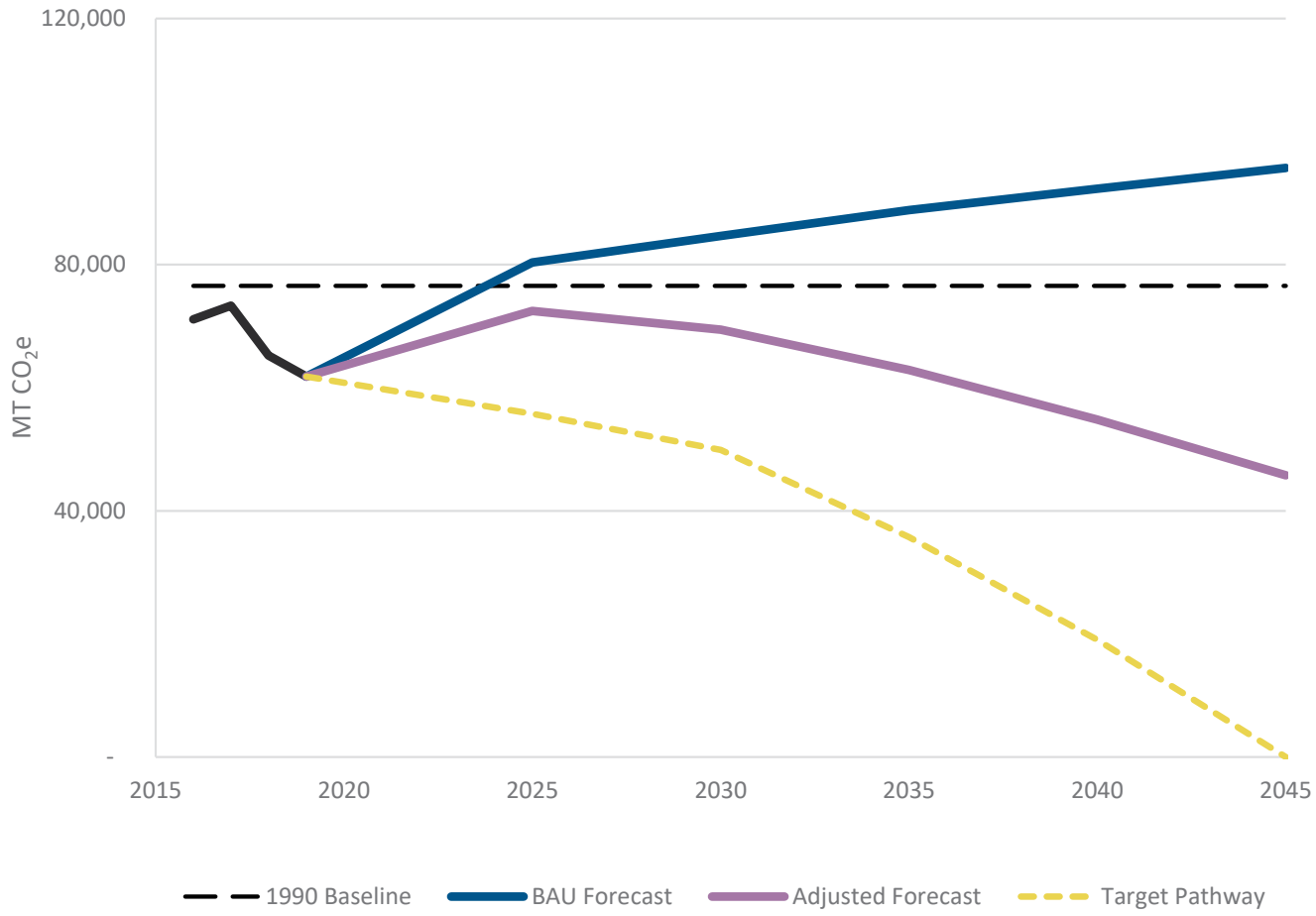
36 https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/scoping_plan_2017.pdf

Table 4-1. CVWD Climate Action Targets

Target Description		1990	2030	2045
CVWD's Climate Action Targets	Percent Reduction from 1990	N/A	40%	100%
	Per Capita Emissions (MT CO_2e/person)	0.26	0.16	0.00
	Absolute Emissions (MT CO_2e)	76,558	49,927	0

Note: CVWD has established per capita targets. For reference, the per capita targets have been translated to absolute emissions in units of MT CO_2e, but these values do not represent CVWD's official targets. The final absolute emissions targets for future years will be calculated once the population numbers are known.

Figure 4-1. CVWD Forecast and Climate Action Targets



GHG Emissions Gap

As shown in Figure 4-1, a gap remains between the projected emissions (purple line) and the target emissions (yellow line), even after accounting for reductions that will result from state legislation. This gap is equal to 0.06 MT CO_2e per person in 2030 and 0.12 MT CO_2e per person in 2045. In absolute emissions, this is equal to 19,499 MT CO_2e in 2030 and 45,781 MT CO_2e in 2045. This gap is how much CVWD will need to reduce its emissions to meet its reduction goals. CVWD aims to close this gap by implementing the GHG reduction measures presented in Section 5, and quantified for GHG emissions reduction potential in Appendix C. These measures will also increase CVWD's resilience to climate change in the coming years.







5. GHG EMISSIONS REDUCTION AND ADAPTATION MEASURES

CVWD has identified voluntary GHG emissions reduction and adaptation measures that were designed to make substantial progress towards reducing GHG emissions to levels that align with the state's GHG emissions reduction goals (i.e., SB 32 and EO B-55-18). Together, these measures will substantially reduce the gap between CVWD's forecasted GHG emissions and its GHG emissions reduction targets. While the measures do not fully achieve the GHG emissions reduction targets identified in Section 4, they serve as the foundation of GHG reduction work at CVWD, with the expectation that additional measures may be identified in the future to achieve further reductions. The measures were selected based on their consistency with current CVWD programs and initiatives, and their ability to result in measurable GHG emissions reductions. As discussed in Section 1, a primary benefit of showing quantifiable progress towards CAAP goals improves CVWD's competitive edge for the state and Federal grant/loan application funding process.

Table 5-1 shows the potential GHG emission reductions that can be achieved through full implementation of each measure. The actual amount of GHG emissions reduced through implementation will be dependent on the degree of implementation of each measure and the combination of measures implemented. As shown in Table 5-1, implementation of these measures can significantly reduce GHG emissions and improve the operational resilience of CVWD's facilities (see Appendix C for the GHG emissions reduction calculations for each measure). Actions for each measure are described within this section.

CVWD's measures include specific goals that CVWD will work towards to reduce GHG emissions and improve operational resilience. As a water district that provides a vital service to its customers, implementation of climate action measures must also be balanced against the cost of water for CVWD's ratepayers. Increased water prices could have equity and other impacts if not thoughtfully considered, thus, each measure can only be implemented once it is deemed financially feasible or when funding/financing has been identified. However, CVWD also understands that failing to prepare for climate change could substantially increase costs in the future, so care must be taken to strike the right balance. Therefore, consistent with CVWD's overall mission, measures that could result significant increase in costs were removed from consideration.

Table 5-1. GHG Reduction and Adaptation Measures by Scope

Measure Code	GHG Reduction Measure	2030 GHG Reduction Potential (MT CO_2e)	2045 GHG Reduction Potential (MT CO_2e)
Scope 1–Direct Combustion and Process Emissions			
DC-1	Phase out natural gas combustion at CVWD facilities, such that 50% of natural gas combustion equipment is replaced with electric equivalents by 2030.	55	122
FL-1	Replace vehicle fleet with zero-emission vehicles as technology allows in alignment with the Advanced Clean Fleet Rule, such that by 2030 40% of vehicle fleet are zero emissions vehicles and by 2045 100% of the vehicle fleet are zero emission.	761	4,080
FL-2	Use alternative fuels to bridge the technology gap to zero emission vehicles and off-road equipment by achieving 100% replacement of #2 diesel with 100% renewable diesel by 2030.	1,066	1,210

Measure Code	GHG Reduction Measure	2030 GHG Reduction Potential (MT CO_2e)	2045 GHG Reduction Potential (MT CO_2e)
FL-3	Reduce vehicle miles traveled and fuel use for non-ZEV/EV fleet vehicles.	417	0
WW-1	Reduce GHG process emissions associated with wastewater treatment.	Supportive[1]	Supportive[1]
Scope 2–Electrical Consumption			
E-1	Utilize low-carbon and carbon-free electricity.[2]	4,486	0
EE-1	Improve energy efficiency at CVWD facilities and buildings.	2,965	0
Scope 3 – Indirect Emissions and Sequestration			
WG-1	Increase organic waste diversion to achieve 75% reduction in landfilled organic waste by 2025 and zero-waste by 2045.	10	32
TR-1	Incentivize more sustainable commutes.	56	95
WC-1	Increase water conservation and local water supply.	Supportive[1]	Supportive[1]
CS-1	Investigate and implement carbon capture and sequestration opportunities.	Supportive[1]	Supportive[1]
CR-1	Reduce construction-related GHG emissions through construction fleet requirements.	Supportive[1]	Supportive[1]
GHG Emissions Reduction Summary			
Total GHG reduction potential with full implementation of all measures		**9,816**	**5,848**
Total GHG reductions needed to meet CVWD's Reduction Goals[3]		**19,499**	**45,781**
GHG reductions remaining		**9,683**	**39,933**

Notes: Values have been rounded and may not add up exactly. See Appendix C for methodology and calculations details. MT CO_2e = metric tons of carbon dioxide equivalent; ZEV/EV = zero emission vehicle/ electric vehicle; GHG = greenhouse gas; DC = Direct Combustion; FL = Fleet; WW = Wastewater; E = Electricity; EE = Energy Efficiency; WG = Waste Generation; TR = Transportation; WC = Water Conservation; CS = Carbon Sequestration; CR = Construction

[1] Supportive measures are those that are not quantifiable as a standalone action but may support quantifiable actions through providing opportunities for studying technologies, establishing policies, etc. Additionally, some measures are listed as supportive as they are in the early phase of implementation and the extent of quantifiable GHG reductions is dependent on the completion of the preceding actions (e.g., conduct feasibility study). Therefore, such measures are conservatively listed as supportive to not overestimate GHG reduction potential.

[2] GHG emission reduction potential is based on all electricity switching to a 50% green rate tier through SCE and IID as part of Measure E-1. The GHG emission reduction potential would increase to 29,712 MT CO_2e by 2030 with all electricity switched to 100% renewable electricity as part of Measure E-1.

[3] As described in Section 4, CVWD established GHG reduction goals in alignment with a SB 32 Efficiency Target pathway.

MEASURE ORGANIZATION

CVWD's measures are organized by Scope, and consist of a suite of actions that support each measure:

1. **Scope:** As described in Section 3, scope refers to the level of operational control CVWD has over a GHG emissions generating activity
   - Scope 1 refers to activities associated with direct combustion or process emissions,
   - Scope 2 refers to emissions associated with electrical consumption, and
   - Scope 3 refers to other indirect emissions generating activities. CVWD's measures are also organized by scope, referring to the category within which the measure's GHG emissions reductions will occur.
2. **Measures:** Measures define quantitative goals within each scope that will contribute to reducing GHG emissions at CVWD.
3. **Actions:** Actions consist of the specific activities CVWD will complete in support of each measure, which together accomplish each measure's goal.

Measures within each Scope address specific emissions sectors, including direct combustion (DC), fleet (FL), wastewater (WW), electricity (E), energy efficiency (EE), waste generation (WG), employee commute/transportation (TR), water conservation (WC), carbon sequestration (CS), and construction (CR). Measures and their actions can be either "quantifiable" (i.e., with clearly defined GHG emissions reduction potential) or "supportive" (i.e., not quantifiable but contributing to the realization of GHG emissions reduction potential of other measures or actions). An example of a **quantifiable action** would be purchasing a specific amount of carbon-free electricity, while a **supportive action** would be implementing a sustainable purchasing policy. The first action reduces GHG emissions in a predictable way, which can be quantified based on available data. The second action may reduce GHG emissions, but that reduction is not quantifiable due to lack of specific metrics associated with a quantity of GHG emissions and attempting to quantify the measure could lead to double counting concerns. While supportive measures may not be quantifiable, they are still important for facilitating the success of the CAAP. Together, the measures and their actions establish a foundational pathway to make substantial progress towards achieving CVWD's 2030 and 2045 GHG reduction goals. Measures and actions will be tracked and re-evaluated on a regular basis to help ensure achievement of the projected reductions.

MEASURE CO-BENEFITS

In addition to reducing GHG emissions, climate change mitigation measures have a range of additional co-benefits that result in a positive impact or benefit to CVWD and its customers. For example, expanding the water conservation programs that have demonstrated success in the past (Measure WC-1) decreases water demand, thereby reducing the pressure on CVWD's water supplies, especially in times of drought. Phasing out natural gas and other fossil-fuel dependent vehicles and equipment (Measures DC-1, FL-1, and FL-2) will contribute to improved air quality in CVWD's service area which would have positive human respiratory health impacts. The following subsections detail the co-benefits expected from implementation of CVWD's GHG reduction and adaptation measures.

Water Supply Reliability and Resilience

Retaining a robust and sustainable water supply is at the heart of CVWD's mission. As CVWD moves forward and faces more extreme impacts of climate change and population growth, water conservation will become even more essential. Water conservation combined with operational resilience results in water supply reliability, and ultimately an ability to adapt to more frequent droughts and extreme weather events. This co-benefit is specifically demonstrated through Measure WC-1.



Cost Savings/Returns on Investment

Although implementation of the GHG emissions reduction measures generally requires an investment of either time or money, many measures have longer-term cost savings that are attributable to reduced utility and transportation costs or avoided waste. The return on these investments can range in timeframe and magnitude, and do not account for the potentially significant economic benefits of avoiding impacts associated with climate change, such as increased drought and flooding risks, or the resiliency related benefits of avoided operational downtime.

For example, establishing a zero emissions fleet and replacing diesel fuel with renewable diesel, as outlined in Measure FL-1 and Measure FL-2, would result in lifecycle cost savings for CVWD. Replacing gasoline powered vehicles at the end of their useful life with electric vehicles may result in a higher up-front cost. However, recent studies including one by Massachusetts Institute of Technology found that over the course of the vehicle's useful life, fuel savings and decreased maintenance needs result in lower lifecycle costs compared to both hybrid and internal combustion vehicles.[37] Maintenance costs on an electric car are much lower because they have fewer moving parts, fewer fluids to be replaced, and are easier on brake systems. Furthermore, the study found that electric vehicle (EV) lifecycle costs are fairly insensitive to electricity costs and that even a doubling of electricity costs does not change the relative cost comparison between battery electric vehicles and internal combustion vehicles.[38]



37. https://www.carboncounter.com/
38. https://pubs.acs.org/doi/suppl/10.1021/acs.est.6b00177/suppl_file/es6b00177_si_001.pdf

Community and Ecosystem Health

One of the primary co-benefits of reducing GHG emissions is directly improving community health. For example, replacing natural gas and propane consuming equipment with electrically-powered equivalents (e.g., Measure DC-1) results in a reduction in carbon monoxide, nitrogen dioxide, and particulate matter (PM) to the air.[39] According to a California Energy Commission study of public health and electrification, electrification would significantly reduce emissions, resulting in improved air quality and a reduction in mortality rates from pollution.[40] The analysis specifically notes that the monetized health benefits for combined changes in ozone and $PM_{2.5}$[41] from electrification would result in $108 billion per year in cost-savings by 2050 for California. Similarly, reducing gasoline and diesel fuel combustion through fleet vehicle electrification (e.g., FL-2) results in incremental benefits to air quality and human health.

Ecosystem health is also improved through increased carbon sequestration (e.g., Measure CS-1), water conservation (e.g., Measure WC-1), and reduced waste (e.g., Measure WG-1). These measures reduce the pressure on local natural resources by allowing more space for trees and native habitats, preserving natural water supplies, and allowing natural waste processes to occur. This in turn improves and stabilizes local habitats to create a more resilient local ecosystem that better supports human life and our resource needs. The health of an ecosystem is directly correlated to the health of the humans living in it because we ultimately depend upon ecosystem products and services (such as availability of fresh water, food, and air).[42]

39. *https://www.epa.gov/indoor-air-quality-iaq/sources-combustion-products-introduction-indoor-air-quality*
40. *https://ww2.energy.ca.gov/2019publications/CEC-500-2019-049/CEC-500-2019-049.pdf*
41. *$PM_{2.5}$ stands for particulate matter below 2.5 micrometers (a unit of measurement). $PM_{2.5}$ is small particulates found in the air that can enter lungs and cause health issues. https://www.cdc.gov/air/particulate_matter.html*
42. *https://www.who.int/globalchange/ecosystems/en/*

SCOPE 1 MEASURES: DIRECT COMBUSTION AND PROCESS EMISSIONS

MEASURE DC-1: Phase out natural gas combustion at CVWD facilities, such that 50% of natural gas combustion equipment is replaced with electric equivalents by 2030

California adopted SB 350 and AB 3232 as important strategies to reduce energy usage in buildings and transition to a low-carbon building stock, thereby supporting the state's overall GHG emission reduction goals (i.e. AB 32 and SB 32). As related to natural gas usage in buildings, SB 350 requires the state to double the energy efficiency savings in natural gas usage by 2030, while AB 3232 required the California Energy Commission (CEC) to assess how to reduce GHG emissions from the state's building stock by 40 percent below 1990 levels by 2030. The CEC's Building Energy Efficiency Standards (Title 24 Parts 6 and 11) includes building standards and codes that support decarbonization efforts through requiring improvements in energy efficiency of building equipment to occur at time of new construction and upgrades. The CEC's Building Energy Efficiency Standards are updated every 3 years and continually driving decarbonization in buildings.

Natural gas and other fossil fuels combusted in CVWD's buildings and facilities emit approximately 100 MT of CO_2e per year. Phasing out natural gas and propane-powered equipment in favor of electric equipment, when combined with carbon-free electricity (Measure E-1), reduces GHG emissions associated with this equipment to zero. Electric appliances, particularly electric hot water heaters and HVAC, are also more efficient than those powered by natural gas and propane, resulting in long-term cost savings for CVWD. Natural gas-powered equipment in CVWD's offices and other facilities will be electrified over time, as financially feasible, as the equipment reaches the end of its useful life. Replacing fossil fuel combustion equipment with electric alternatives will align with the state policies and the CEC's Building Energy Efficiency Standards.

ACTIONS

ACTION DC1-1: Conduct a survey of natural gas and propane consuming devices in offices, control buildings, and other CVWD structures. By 2025 establish a schedule to replace non-emergency use fossil fuel-consuming equipment with electric-powered equivalents based on operational lifespan estimates.

ACTION DC1-2: Explore rebate, grant, or partnership opportunities to fund the replacement of fossil-fuel consuming equipment like HVAC and hot water heaters with electric powered equivalents like heat pumps.

ACTION DC1-3: Based on feasibility and the replacement schedule, replace 50% of non-emergency fossil-fuel-consuming equipment with electrically powered equivalents in existing office and CVWD buildings by 2030. Additionally, with obtainment of funding establish goal to replace 75% of equipment by 2045.

TARGET METRICS

- 50% reduction in natural gas by 2030
- 75% reduction in natural gas by 2045

GHG EMISSIONS REDUCTIONS

- 55 MT CO_2e in 2030
- 122 MT CO_2e in 2045



MEASURE FL-1: Replace vehicle fleet with zero-emission vehicles as technology allows in alignment with the Advanced Clean Fleet Rule, such that by 2030, 40% of vehicle fleet are zero emissions vehicles and by 2045 100% of the vehicle fleet are zero emission

A significant focus of California's climate policy is the decarbonization of the transportation sector either through implementations of zero emissions vehicles (ZEV) technology where feasible and the use of cleaner fuels for combustion everywhere else. CARB is currently developing a medium and heavy-duty zero-emission fleet regulation with a goal of all California truck and bus fleets being zero-emission by 2045. As a special district, CVWD will be required to comply with the requirements of the Advanced Clean Fleet Rule once adopted and implementation beginning in 2023, including meeting the ZEV targets as a percent of the total fleet in alignment with the ZEV Target Phase-In Schedule. As part of the compliance obligation, CVWD will be required to report on the fleet annually and when a new vehicle is added to the fleet either as a replacement or addition.

CVWD's fleet emits on average 3,600 MT of CO_2e per year (5% of CVWD's total GHG emissions). Fully electrifying or otherwise decarbonizing CVWD's fleet and powering it with carbon-free electricity or other zero emission technology (e.g., renewable hydrogen) allows for this emission source to achieve carbon neutrality. While there are already commercially available ZEV passenger cars and trucks, the recent EO N-79-20, which directs the California Air Resources Board to develop regulations to achieve 100 percent zero-emission car sales in California by 2035 and zero-emission medium- or heavy-duty vehicles by 2045, as well as supporting regulations such as the Clean Miles Standard, Advanced Clean Cars II Program, and Advanced Clean Fleets Rule, have accelerated ZEV technology for medium-duty, heavy-duty, and off-road equipment. Further, to support early adoption and promote infrastructure development, incentives are available for vehicle replacement as well as credits available for charging or hydrogen station owners under the Low Carbon Fuel Standard (LCFS) regulation that can offset the cost of fuel and ZEV vehicle replacements. Early implementation will ensure compliance with the Advanced Clean Fleet Rule as well as access to early action incentives.

ACTIONS

ACTION FL1-1: As part of vehicle fleet replacement process, incorporate a return on investment analysis in the criteria to evaluate ZEV/EV options.

ACTION FL1-2: Adopt an ZEV/EV First Policy for fleet vehicles so that ZEV/EVs are purchased when replacements are needed unless technological, operational, or cost effectiveness issues are identified in alignment with EO B-48-18 and SB 350 transportation electrification goals. Revise policy requirements when the Advanced Clean Fleet regulation is formally adopted and implementation of Rule begins in 2023.

ACTION FL1-3: Pursuant to the Advanced Clean Trucks regulation adopted June 2020, comply with the Large Entity On-Time Reporting Requirement.

ACTION FL1-4: Convert 40% of the CVWD fleet to vehicles and equipment to be powered by electricity, fuel cells, and/or other ZE technologies by 2030 and aim to convert 100% of CVWD fleet to ZEV by 2045 in alignment the Advanced Clean Fleets Rule (Rule recommendation to Board December 2021; implementation begins 2023).

ACTION FL1-5: Investigate grant opportunities; local, state, and Federal incentives; and/or partnerships to purchase new EVs and install EV charging and/or ZEV infrastructure at facilities for fleet and public use. Conduct a return on investment analysis that assess cost savings from incentives for early replacement of fleet vehicles with ZEV/EV versus the traditional replacement schedule.

TARGET METRICS

- 40% fleet conversion to ZEV by 2030
- 100% fleet conversion to ZEV by 2045

GHG EMISSIONS REDUCTIONS

- 761 MT CO_2e in 2030
- 4,080 MT CO_2e in 2045



MEASURE FL-2: Use alternative fuels to bridge the technology gap to zero emission vehicles and off-road equipment by achieving 100% replacement of #2 diesel with 100% renewable diesel by 2030

CVWD currently uses a combination of gasoline, diesel, and compressed natural gas to fuel its fleet. While zero-emission heavy-duty vehicles are not currently market-ready, using low-carbon intensity fuels like renewable diesel in existing vehicles and equipment does not require equipment alterations and helps reduce GHG emissions over the short-term. The use of alternative fuels allows for additional time to fully vet and/or pilot the new zero-emission technology before infrastructure investments are made, which could help improve the return on investment. The state's LCFS regulation is driving the market to increase the availability and decrease the cost of alternative fuels that may offer a return on investment benefit to switch to alternative fuels now in equipment and fleet vehicles that do not need technology changes. CVWD has already conducted a feasibility and cost analysis, identifying a source of renewable diesel that can be utilized in all existing vehicles and equipment currently utilizing diesel with no changes in technology necessary and minimal change in cost. Further, renewable diesel is anticipated to reduce maintenance costs of equipment over traditional diesel due to a decreased need for diesel particulate filter (DPF) services as renewable diesel has less impurities such as sulfur, oxygen and other aromatic compounds.[43]

ACTIONS

ACTION FL2-1: Prepare an assessment that determines the quantity of renewable diesel needed, any costs incurred from the transition, and identifies a reliable source of renewable diesel.

ACTION FL2-2: Present findings from the assessment of transitioning from diesel to renewable diesel (Action FL2-1) to Internal Stakeholders on the assessment of transitioning from diesel to renewable diesel.

ACTION FL2-3: Transition current diesel tanks at CVWD-owned fueling depots such that 50% of diesel-powered fleet vehicles and equipment can utilize renewable diesel by 2023 and 100% by 2027.

ACTION FL2-4: Partner with heavy-duty EV companies to conduct pilot studies and facilitate advancements in technology for vehicle classes which do not currently have viable options. Investigate grant opportunities for such projects and partnerships.

43. *https://www.neste.us/neste-my-renewable-diesel/industries/public-fleets*

ACTION FL2-5: Ensure any on-road diesel-fueled medium heavy-duty and heavy heavy-duty engines in CVWD's vehicles fleet are in compliance with the Fleet Rule for Public Agencies and Utilities Fleet.

TARGET METRICS

- 50% replacement of diesel with renewable diesel by 2023
- 100% replacement of diesel with renewable diesel by 2027

GHG EMISSIONS REDUCTIONS

- 1,066 MT CO_2e in 2030
- 1,210 MT CO_2e in 2045



MEASURE FL-3: Reduce vehicle miles traveled and fuel use for non-ZEV/EV fleet vehicles

The GHG emissions reduction potential that will be achieved due to the transition to a ZEV fleet, as mandated by the Advanced Clean Fleet Rule, is further maximized by prioritizing use of ZEVs for longer distance travel. Reducing VMT of non-ZEV fleet vehicles limits GHG emissions from mobile combustion of traditional fossil fuel and may also provide cost savings. The current GPS system in fleet vehicles currently gathers data every two minutes. By upgrading fleet vehicles' GPS systems with a more technologically advanced version that gathers data on a continuous basis, the fleet can operate more efficiently. Additionally, preventative maintenance of fleet vehicles optimizes vehicles operating conditions thereby reducing emissions.

ACTIONS

ACTION FL3-1: Upgrade current GPS systems in vehicle fleet to improve mileage tracking, track idle time, and track performance. Adjust vehicle dispatch planning and reduce idle time as necessary to reduce VMT and improve vehicle operating conditions.

ACTION FL3-2: Continue to perform preventative maintenance on vehicle fleets to improve performance, including the procurement of low rolling resistance tires, using the correct tire air pressure, and regularly replacing air filters which will improve fuel efficiency.

TARGET METRICS

- Upgrade GPS System for 100% of fleet vehicles by 2023

GHG EMISSIONS REDUCTIONS

- 417 MT CO_2e in 2030
- 309 MT CO_2e in 2045[44]

44. If Measure FL-1 were fully implemented there would be no emission reductions as all fleet vehicles would be zero emission. EVs would charge from the grid which is required to be 100% carbon free by 2045.

MEASURE WW-1: Reduce GHG process emissions associated with wastewater treatment

Wastewater treatment process emissions are CVWD's second largest GHG emissions source due to the release of methane. As buildings are decarbonized and energy like electricity becomes more carbon-free, wastewater emissions will become CVWD's predominant emission source and will need to be addressed as we approach 2045 to align with the states carbon neutrality goals. Because technology for reducing methane emissions from wastewater treatment plants can be expensive and requires advanced planning, this measure is focused on preliminary feasibility analysis and investigating funding opportunities for future implementation. Technology is advancing and programs such as LCFS may provide cost-effective opportunities to convert captured methane to biofuel for electricity generation or vehicle fleet use. It is anticipated that wastewater emissions will become a major focus of California for reducing GHG emissions in the future, at which point additional incentives for this work is expected to become available.

ACTIONS

ACTION WW1-1: Investigate opportunities associated with design features of the CVWD Master Plan for wastewater treatment facilities to reduce emissions and/or capture methane. For example, as part of the proposed CIP project to install two new anaerobic digesters, consider conducting a pilot study for methane capture and conversion to biofuel under the LCFS Program.

ACTION WW1-2: Investigate potential partnerships with agencies or entities looking to obtain biogas for fuel production that would fund equipment costs.

TARGET METRICS

- Identification of opportunities for methane reduction or use from wastewater treatment

GHG EMISSIONS REDUCTIONS

- Supportive

SCOPE 2 MEASURES: ELECTRICITY CONSUMPTION

MEASURE E-1: Utilize low-carbon and carbon free electricity

Electricity consumption is CVWD's single largest emission source. While SB 100 ensures that emissions from retail electricity will be reduced to zero by 2045 through the California RPS, procuring carbon-free electricity now expedites this timeline and will provide significant reductions in CVWD's GHG emissions. By opting into a more renewable or "greener" electricity tier through current electricity providers, CVWD has the opportunity to achieve most of its GHG emissions reductions goal. Further, switching to low-carbon or carbon-free electricity will make other measures more impactful by further reducing GHG emissions. For example, electrification of buildings, equipment and vehicles will achieve a greater GHG emission reduction if the electricity sourced is low-carbon or carbon neutral. CVWD currently receives electricity from SCE and IID. For SCE the cost per kWh for opting into the Green Rate package ranges from 0.39 to 2.71 cents per kWh more for business customers depending on the rate schedule and green package tier.[45] IID also just recently launched a Green Energy Rate Program where the cost per kWh for opting into the Green Energy Program ranges from 1.31 to 2.0 cents more depending on the tier selected in the program.[46] While there is a premium associated with opting into a more renewable or "greener" electricity tier with the current electricity providers, there are other opportunities to enter into a Power Purchase Agreement (PPA) directly with a renewable energy provider that may have cost benefits by locking in a low rate for electricity today that would be insulated from long term cost increases. The cost per kWh for PPAs with solar and storage are at historically low rates with some projects pushing below 2 cents per kWh.[47] Further, some electricity providers, such as SCE, award LEED points for participating in the "greener" electricity packages. LEED credits can qualify for tax rebates or credits, offsetting the cost of the premium. This measure also focuses on developing additional renewable energy generation and/or battery storage projects. GHG reduction potential is shown

45. https://www.sce.com/residential/rates/standard-residential-rate-plan/green-rates
46. https://www.iid.com/home/showpublisheddocument/17257/636747759993730000
47. https://pv-magazine-usa.com/2019/06/28/los-angeles-seeks-record-setting-solar-power-price-under-2%C2%A2-kwh/

for switching to the 50% green rate tier at both SCE and IID. Additional reductions would be achieved by switching to the 100% green rate tier.

ACTIONS

ACTION E1-1: Conduct an annual return on investment analysis of green electricity packages available from current electricity providers, SCE and IID, as well as from joining Desert Community Energy (DCE). Return on investment analysis should include an evaluation of electricity accounts that can be switched, estimated cost for the switch, as well as benefits from achieving greater GHG emissions reduction as it relates to grant funding opportunities associated with the CAAP. Exceed the renewable electricity standard set by SB 100 for electricity purchases by opting into a green rate package with SCE and IID.

ACTION E1-2: Continue to analyze time-of-use emissions factors and costs to better model GHG emissions and costs for future projects. Include analysis as part of annual CAAP progress monitoring.

ACTION E1-3: When operationally feasible, schedule times of high pumping to coincide with times of high renewable energy availability and low demand to reduce GHG emissions and smooth demand curve. Establish a goal to shift 10% of pumping times to mid-day.

ACTION E1-4: Complete the installation of solar-topped parking structures and battery storage system to cover 100% of CVWD Palm Desert Campus energy consumption needs by 2030.

ACTION E1-5: Investigate opportunities and partnerships with fuel providers within the LCFS program associated with generating low-carbon intensity (CI) electricity from wastewater treatment plants to generate LCFS credits or power for water reclamation plan electricity needs associated with the Palm Desert Campus (i.e., WRP 10).

ACTION E1-6: Investigate opportunities to reduce energy costs, improve resilience, and reduce electricity GHG emissions through additional on-site solar and battery storage to support CVWD operational energy use and/or investigate the cost effectiveness to enter a Power Purchase Agreement.

TARGET METRICS

- Electricity accounts switched to 50% Green Rate option
- Shift 10% of pumping times to mid-day
- Install solar-topped parking structures and battery storage system to cover 100% of CVWD Palm Desert Campus

GHG EMISSIONS REDUCTIONS

- 4,486 MT CO_2e in 2030
- 0 MT CO_2e in 2045[48]

48. No emission reductions are achieved post 2045 as SB100 requires all retail electricity providers to obtain electricity from 100% renewable sources

MEASURE EE-1: Improve energy efficiency at CVWD facilities and buildings

Improving pump efficiency, installing LED lighting, and installing energy recovery systems will all reduce the total demand for electricity from CVWD systems, saving money and reducing emissions. Improving equipment efficiency also aligns with the CEC's Building Energy Efficiency Standards. The cost of electricity from the grid varies throughout the day depending on supply and demand. When there is a high supply of renewable electricity available, such as solar-generated electricity during midday, both the cost and the emissions factor of the electricity is lower. Through implementation of time-of-use programs and scheduling pumping during times of high renewable energy and low demand and implementation of energy optimization measures at the Water Reclamation Plants (WRPs) CVWD will further reduce GHG emissions and increase cost savings.

ACTIONS

ACTION EE1-1: As part of the Asset Management program, identify aging equipment due for replacement throughout CVWD facilities and identify energy efficient alternatives to use for the replacement (e.g., EnergyStar certifications). Include a return on an investment analysis as part of the replacement process that evaluates the capital investment for an energy efficient alternative piece of equipment, cost savings associated with improved energy efficiency, and identifies any grants or rebates associated with such equipment replacement.

ACTION EE1-2: Continue to conduct energy audits annually and implement top energy recommendations. As part of CAAP monitoring, track energy improvements due to implementation of energy audit recommendations annually.

ACTION EE1-3: Based on the recommendations from Coachella Valley Water District WRP Energy Optimization Evaluation, implement the top Energy Efficiency Measures (EEM) at WRP 4, WRP 7 and WRP 10 with a Benefit-to-Cost Ratio Greater than 1.0 by 2030. The identified EEM are aligned with the Sanitation Master Plan and include energy optimization such as aeration improvements, treatment optimization, improved site and building lighting, and addition of solar panels to the WRPs.

ACTION EE1-4: Develop a policy that would require any new CVWD building to achieve a minimum level of LEED Gold certification or LEED equivalent to improve energy efficiency and reduce cost based on high return on investment greater than 20%.

ACTION EE1-5: Continue to utilize automated lighting controls for indoor/outdoor lighting for CVWD campuses pursuant to

the current CEC Building Energy Efficiency Standards (Title 24, Part 6 and 11).

ACTION EE1-6: Pursuant to the CEC 2019 Building Energy Efficiency Standards (Title 24, Part 6 and 11), require all new construction and building upgrades utilize light emitting diode (LED) lighting technology only. Establish goal to convert all interior and exterior lighting at 50% of CVWD facilities to LED technologies by 2027 and 100% by 2035.

ACTION EE1-7: Continue CVWD's time of use program that identifies and established permanent shifts of high-electricity use to times when renewable energy is plentiful through educational programs on energy and thermal storage, load timing/controls, pre-cooling/pre-heating, and other time-energy demand measures.

ACTION EE1-8: Continue to identify opportunities to develop and profile notable energy efficiency projects. Track energy reduction from implementation of energy efficiency projects and prepare a report detailing successes for internal stakeholders by 2030.

TARGET METRICS

- Implement top Energy Efficiency Measures at Water Reclamation plants with a Benefit-to-Cost Ration Greater than 1[49]
- 50% replacement of lighting fixtures with LEDs by 2027
- 100% replacement of lighting fixtures with LEDs by 2035

GHG EMISSIONS REDUCTIONS

- 2,965 MT CO_2e in 2030
- 0 MT CO_2e in 2045[50]



49. *Annual electricity savings estimated from implementation of the WRP energy optimization measures in the Coachella Valley Water District WRP Energy Optimization Evaluation equates to approximately 9% reduction in CVWD's electricity usage.*
50. *SB 100 requires all electricity providers in the state to provide 100% carbon free electricity by 2045; therefore, no GHG emissions reductions can be gained from energy efficiency measures in 2045, since the emissions factor for electricity will be zero.*

SCOPE 3 MEASURES: INDIRECT EMISSIONS AND SEQUESTRATION

MEASURE WG-1: Increase waste diversion to achieve 75% reduction in landfilled organic waste by 2025 and zero-waste by 2045

Waste generation at CVWD contributes a small amount to the overall GHG emissions from CVWD operations. A majority of the GHG emissions resulting from waste sent to the landfill are caused by decomposition of organic material under anaerobic conditions. The remainder of the emissions come from inorganic wastes, such as plastic, which have both upstream and downstream emissions. Therefore, increasing the diversion of organic and inorganic waste streams is a primary measure to reduce waste related GHG emissions. In alignment with SB 1383and AB 341, CVWD will develop and implement a waste diversion plan to reduce organic waste sent to the landfill by 75% using 2014 levels as a baseline and strive to achieve zero-waste sent to landfills by 2045. Additionally, CVWD will report biosolid quantity and destination to CalRecycle in compliance with AB 901.

ACTIONS

ACTION WG1-1: Conduct a waste audit by 2023 to determine what percentage of the waste stream is organic compared with the waste stream in 2014 and therefore, subject to SB 1383.

ACTION WG1-2: Expand CVWD's current waste management by developing net-zero waste policies and programs at all facilities to reduce landfilled organic waste by 75% by 2025 from 2014 levels and achieve zero landfilled waste by 2045 in alignment with AB 341 and SB 1383.

ACTION WG1-3: Continue to implement organic waste diversion strategies where green and wood waste is separated from other waste streams and sent to the Greenleaf Biomass Power Plant in Mecca or other biomass/renewable energy center.

ACTION WG1-4: Investigate funding opportunities to develop an organics program and deploy organic waste bins at all CVWD facilities such that organics generated from CVWD operations is collected and diverted from the landfill by 2025.

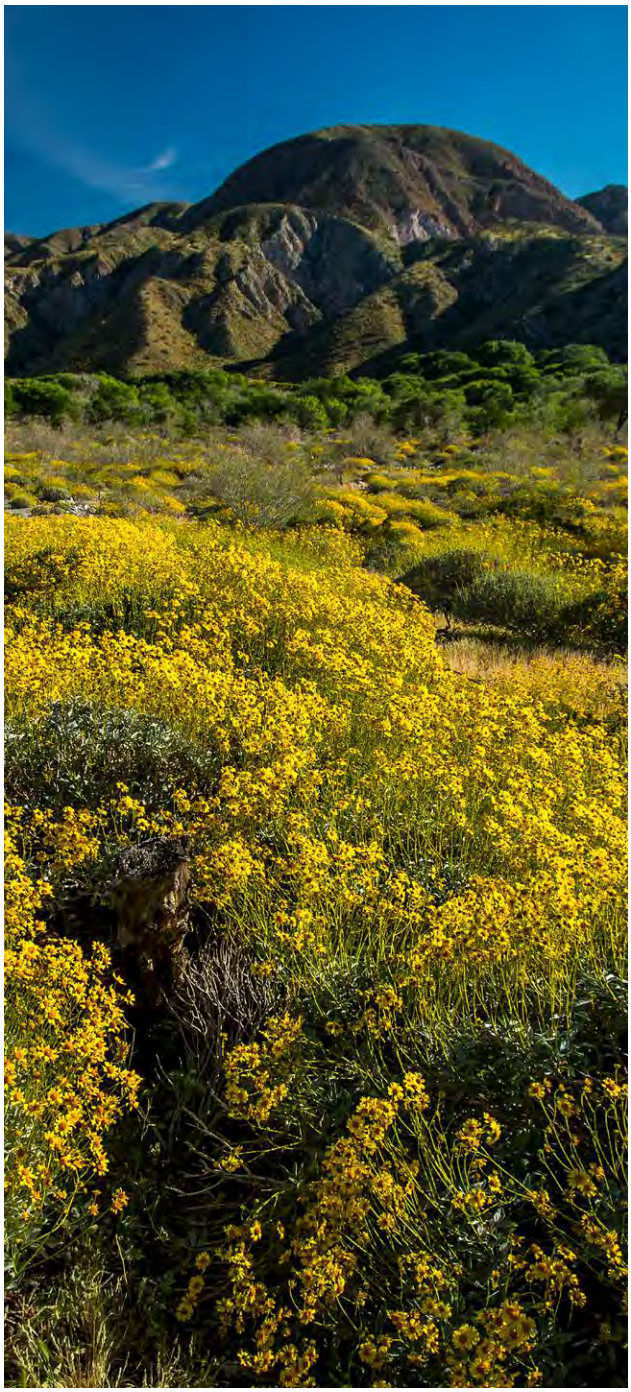
ACTION WG1-5: Pursuant to AB 901, report the quantity and destination of disposed biosolids from wastewater treatment plants to CalRecycle quarterly.

TARGET METRICS

- Conduct waste audit by 2023
- 75% organic waste reduction by 2025 compared with 2014 baseline[51]
- 100% waste reduction by 2045 (i.e. approximately 4% reduction annually)

GHG EMISSIONS REDUCTIONS

- 10 MT CO_2e in 2030
- 32 MT CO_2e in 2045



51. *SB 1383, effective 2022, sets statewide emissions reduction targets to 40 percent below 2013 levels by 2030 for methane, 75 percent reduction in organic material disposed in landfills from 2014 levels by 2025 and required jurisdictions to adopt ordinances or other enforceable mechanisms to impose penalties for non-compliance. CVWD will be required to comply with local jurisdictions ordinances established to meet SB 1383 requirements.*

MEASURE TR-1: Incentivize more sustainable commutes

CVWD currently tracks employee commuting habits and provides last mile facilities to encourage alternative commute options. In addition, providing education on alternative commute options, information on available ZEV incentives/rebates available, offering flexible work schedules (less cars commuting), and providing rideshare incentives and preferential parking for ZEVs in support of California's ZEV goals will further lower CVWD's carbon footprint associated with employee commutes. The increase of EVs and ZEV us by employees for commuting is inevitable with the establishment of Zero-Emission Vehicle Regulation and N-79-20, which requires auto manufacturers to provide more ZEVs for sale in California to achieve the state's goal of 100% of sales of new passenger vehicles to be ZEV by 2035. Programs like LCFS and the Clean Transportation Program (AB 118) provide credits or funding, respectively, for developing ZEV fueling infrastructure to incentivize the development of necessary ZEV infrastructure to support the new ZEVs on the road. Further, CARB established a rebate program for individuals to replace their vehicles with a ZEV. As such, it is anticipated that California's goals and incentives will lead to an increased use of ZEVs by CVWD employees. Under this measure, CVWD will evaluate incentives, credit generating opportunities, partnerships, and the return on investment to provide ZEV infrastructure for employees and visitors which will further encourage employees to drive personal ZEVs.

ACTIONS

ACTION TR1-1: Continue to conduct annual SCAQMD transportation surveys to monitor CVWD employees needs and motivation for traveling by single occupancy vehicles versus alternatives. Based on survey results, expand or promote programs and incentives that have proven successful strategies in reducing employee VMT.

ACTION TR1-2: Continue to offer rideshare incentives to employees who carpool. Consider offering other incentives to employees to use an alternative mode of transportation to commute (e.g. public transportation, bikes).

ACTION TR1-3: Allow all employees located at CVWD Palm Desert and Coachella Campuses to utilize flexible 9/80 schedule through 2030 to reduce travel time, VMT, and GHG emissions.

ACTION TR1-4: Conduct a ZEV/EV Feasibility Study by 2026 to investigate funding opportunities or partnerships to install ZEV/EV infrastructure at CVWD facilities and to determine the number and locations most effective for ZEV/EV infrastructure installation. Discuss with SCE their current pilot programs to install infrastructure at workplaces and evaluate future opportunities for CVWD to host pilot program.

ACTION TR1-5: Based on funding and ZEV/EV Feasibility Study, install ZEV and/or EV infrastructure to support at least a 15% transition to ZEVs/EVs by 2030 and 30% by 2045.

ACTION TR1-6: Expand provided preferred parking for EV/ZEVs to incentivize use of ZEVs/EVs by employees.

ACTION TR1-7: Promote employee use of carbon-free and low carbon transportation by providing educational materials (e.g. fliers in break rooms, info on transportation survey, info on websites) on the benefits of commute options including public transportation, EV/ZEV options, and vanpools.

TARGET METRICS

- 85% participation in 9/80 schedule by 2030 and maintained through 2045
- 15% transition to EVs among employees by 2030

GHG EMISSIONS REDUCTIONS

- 56 MT CO_2e in 2030
- 95 MT CO_2e in 2045



MEASURE WC-1: Increase water conservation and local water supply

CVWD has a long history of promoting water conservation, which has resulted in measurable reduction in retail water usage and indirectly reduces GHG emissions. CVWD has had a number of successful water conservation programs such as providing indoor rebates for water efficient appliances, landscape rebate programs including turf reduction incentives for residences and golf courses, practicing and promoting water-efficient irrigation and low water usage planting, and developing education programs for specific customer groups such as the Agricultural Water Advisory Group. CVWD achieved a 20% reduction in per capita water use as required by the Water Conservation Act of 2009 as a direct result of these programs. CVWD will expand these water conservation efforts to achieve further reductions in per capita water use that will align with new state regulations. Reduced per capita water consumption allows CVWD to meet the water demands of a growing population and reduce operational emissions.

ACTIONS

ACTION WC1-1: Expand programs which educate customers on water conservation initiatives through workshops and speaking engagements. In coordination with retail water suppliers, host regular workshops and classes on water conservation, including providing information on drought-tolerant landscaping, available rebates for water retrofits, and water efficiency strategies in new buildings. Continue to offer workshops and classes even when drought conditions are not present. Develop outreach materials for water conservation.

ACTION WC1-2: Continue to work with local groups such as the Agricultural Water Advisory Group to teach farm owners, managers, and irrigators concepts in irrigation water and salinity management as well as promote new technology to help the conservation effort. Apply for grant-funded agricultural rebate programs to assist those in the agriculture industry to reduce water use.

ACTION WC1-3: Analyze current water use reduction programs to identify which programs have the highest adoption rate and water use reduction impacts. Expand those programs which are found to be most effective.

ACTION WC1-4: Prepare a formal landscape management plan for CVWD that consolidates and expands upon the goals and policies for landscaping at CVWD property. The Plan should identify whether and where there are resource-consumptive landscapes on CVWD property that can be changed out to more water-conserving, slower growth plants that require less maintenance. Continue to implement potable water conservation strategies in landscape design and maintenance (such

as replacing water intensive areas with drought-resilient native plants [Bermuda grass], using low-flow water fixtures, installing sophisticated irrigation software to control water, investing in systems to monitor pipe leakage, and limiting turf development).

ACTION WC1-5: Require new or redeveloped CVWD developments to be low water use through landscaping with drought tolerant plants, permeable paving, green infrastructure, and incorporating other low-impact development design features to allow for increased infiltration, even in heavy rains.

ACTION WC1-6: Continue to promote water conservation through water-efficient irrigation and desert horticulture demonstration gardens and educational material.

ACTION WC1-7: Complete and implement Irrigation Master Plan that establishes goals and a timeline for improved water conservation related to irrigation. The Plan should identify the opportunities for replacement of groundwater use for irrigation with recycled water use, including a cost assessment and prioritization of opportunities.

ACTION WC1-8: Seek additional grant funding to expand the Golf Course Conservation program with a goal to remove/replace an additional 115,000 square feet of turf by 2030.

ACTION WC1-9: Continue to implement and expand on successful water conservation rebate programs (e.g., Water audits program for large water users, Residential smart controller rebate program, Commercial irrigation upgrade program, Commercial landscape rebate program, Residential landscape conversion rebate program, Commercial pre-rinse nozzle rebate program, Commercial water broom rebate program, Residential hot water recirculating pump rebate program, Commercial water efficient toilet rebate program, Residential ultra-low flush toilet replacement rebate program, Residential high efficiency washing machine rebate program) in alignment with the current statewide water conservation goals.

ACTION WC1-10: Develop and adopt a schedule for installation of water meters in existing buildings and irrigation zones to establish a water consumption baseline at CVWD owned properties with the Facilities Group. Reduce CVWD water consumption per capita at facilities in alignment with the current statewide goals.

ACTION WC1-11: Investigate new advance technology systems to increase District's recycled and ground-water recovery systems to maintain local water supply (e.g., Mid-Valley Pipeline Project). Invest in such technology as it becomes feasible and cost-effective.

TARGET METRICS

- Reduced per capita water consumption by 2030 and 2045 in alignment with state policies

GHG EMISSIONS REDUCTIONS

- Supportive

MEASURE CS-1: Investigate and implement carbon sequestration opportunities

Measure CS-1 provides opportunities for negative emissions through carbon capture and storage and/or carbon sequestration on natural and working lands (e.g., rangeland, forests, woodlands, wetlands and coastal areas, grasslands, shrubland, farmland, riparian areas, and urban green space). Carbon capture and storage refers to the process of capturing CO_2 emissions from the atmosphere or an industrial process, transporting it, and storing it in deep geological formations, the ocean, or minerals.[52] Carbon sequestration programs will be an important tool to mitigate some of CVWD's emissions. While carbon capture and sequestration programs can require a large investment up-front, this cost could be mitigated through credit generation opportunities based on CARB's "Carbon Capture and Sequestration protocol" adopted in 2018 as well as through other voluntary and Federal carbon markets.

ACTIONS

ACTION CS1-1: As part of the currently CVWD published Landscape Manual, include information regarding flora and fauna CO_2 sequestration potential to promote the incorporation of landscape plants that are both low water and CO_2 sequestering. Consider vegetative options with higher CO_2 sequestration potential for CVWD facilities landscaping.

ACTION CS1-2: Research/evaluate the carbon sequestration potential of the CVWD Constructed Habitat Project currently in design. Develop partnerships with appropriate agencies, such as the wildlife agency, to investigate potential carbon sequestration projects to collaborate on.

TARGET METRICS

- Increased carbon sequestration on CVWD's natural and working lands

GHG EMISSIONS REDUCTIONS

- Supportive

52. *https://www.ipcc.ch/site/assets/uploads/2018/03/srccs_wholereport-1.pdf*

MEASURE CR-1: Reduce construction-related GHG emissions through construction fleet requirements

Emissions from construction activities are estimated to contribute up to 8% of CVWD's overall GHG emission profile. Depending on the approved funding and Capital Investment Projects underway, emissions from construction can vary. Further, CVWD does not have direct control over construction emissions other than the contracting particular fleets for a project. However, by ensuring CVWD is only contracting with construction fleets that are in compliance with current regulations to phase-in newer engines, CVWD's overall construction emissions will continue to decrease. state goals to transition to zero-emissions off-road equipment will further reduce emissions as technology improves for such types of equipment. Construction fleets that CVWD contracts with will be required to comply with the Off-Road Diesel Regulation. With EO N-75-20, technology for off-road vehicles is anticipated to continue to advance, providing cost-effective options for off-road equipment.

ACTIONS

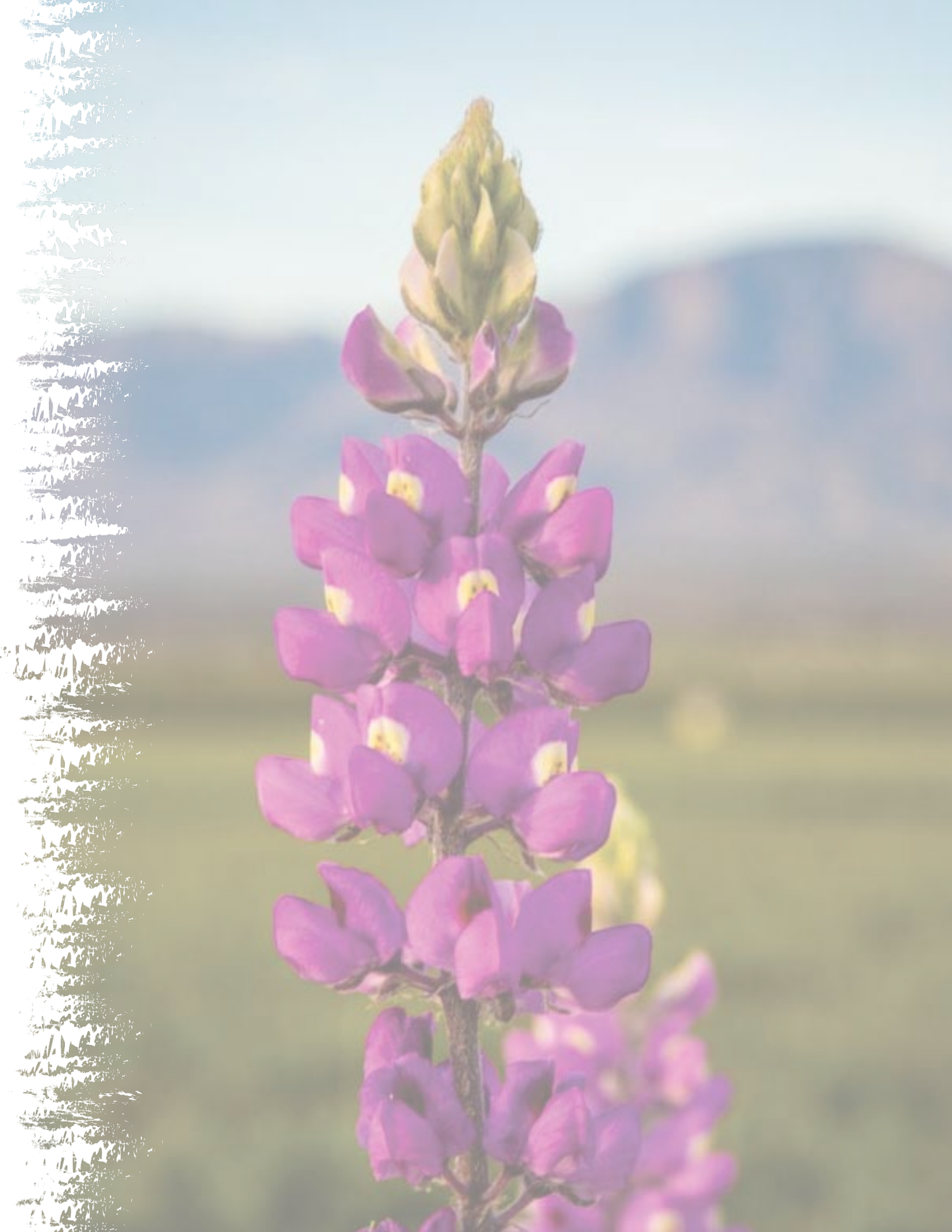
ACTION CR1-1: In alignment with California' Regulation for In-Use Off-Road Diesel-Fueled Fleets, adopt a policy requiring that construction fleets average fleet index are equal to or are less than the annual fleet average target and prioritizes Tier 3 off-road diesel-powered construction equipment greater than 50 hp when equipment is available and feasible. In addition, prioritize use of construction equipment that is outfitted with BACT devices certified by CARB, and emissions control devices used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar-sized engine as defined by CARB regulations by 2023.

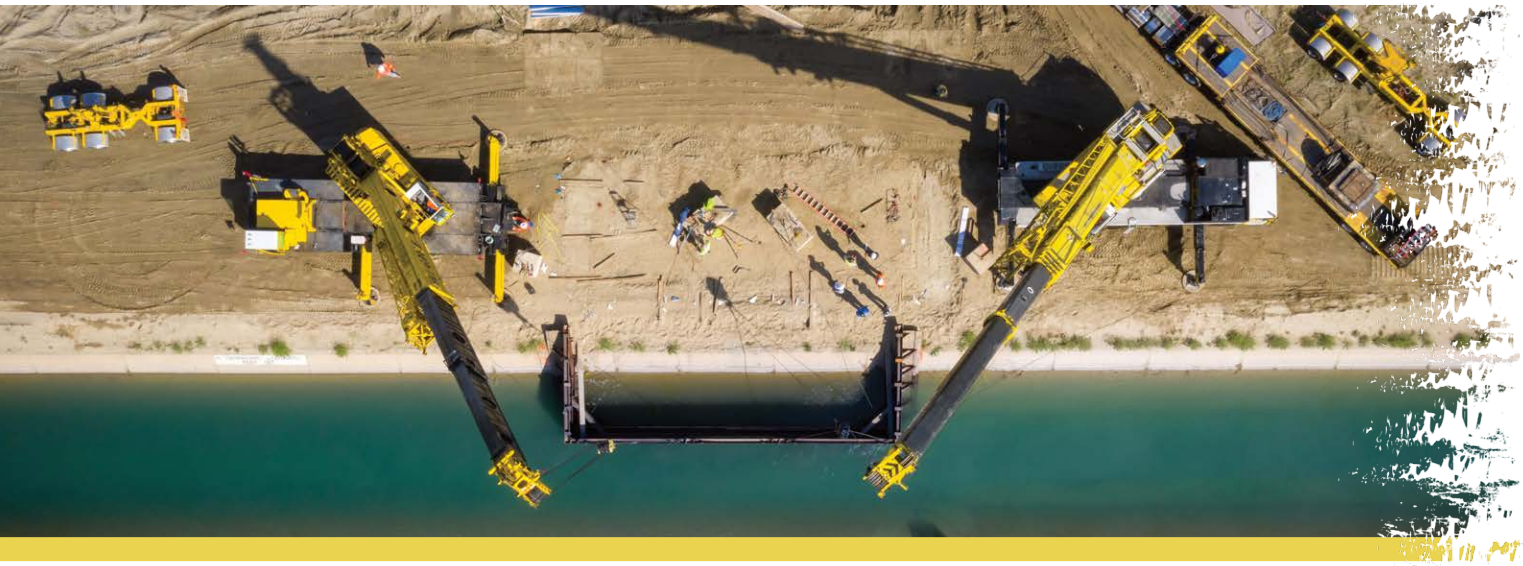
TARGET METRICS

- Contracted construction fleets average fleet index are equal to or less than the annual fleet average target

GHG EMISSIONS REDUCTIONS

- Supportive





6. IMPLEMENTATION AND MONITORING STRATEGY

CAAP IMPLEMENTATION

This CAAP outlines specific strategies and measures to achieve demonstrative GHG emissions reduction and improve the resilience of CVWD's operations (see *Section 5*). Implementation of the CAAP is planned to occur between 2021 and 2045. Due to the long implementation time period of the CAAP measures and actions may evolve over time as CVWD tracks progress, new technologies and legislation emerge, and funding opportunities for additional GHG emissions reduction opportunities are identified. This section details CVWD's implementation plan for the CAAP, which will include transforming measures and actions into on-the-ground policies, programs, and projects within CVWD. Implementation of this CAAP is grounded in science and current best practices in climate action planning.

CAAP WORKING GROUP

Planned CAAP implementation is central to the success of any CAAP in achieving GHG reduction targets and increasing resiliency. Implementation planning involves identifying responsible parties for implementation. Several departments within CVWD will play a key role in the CAAP's implementation and monitoring.

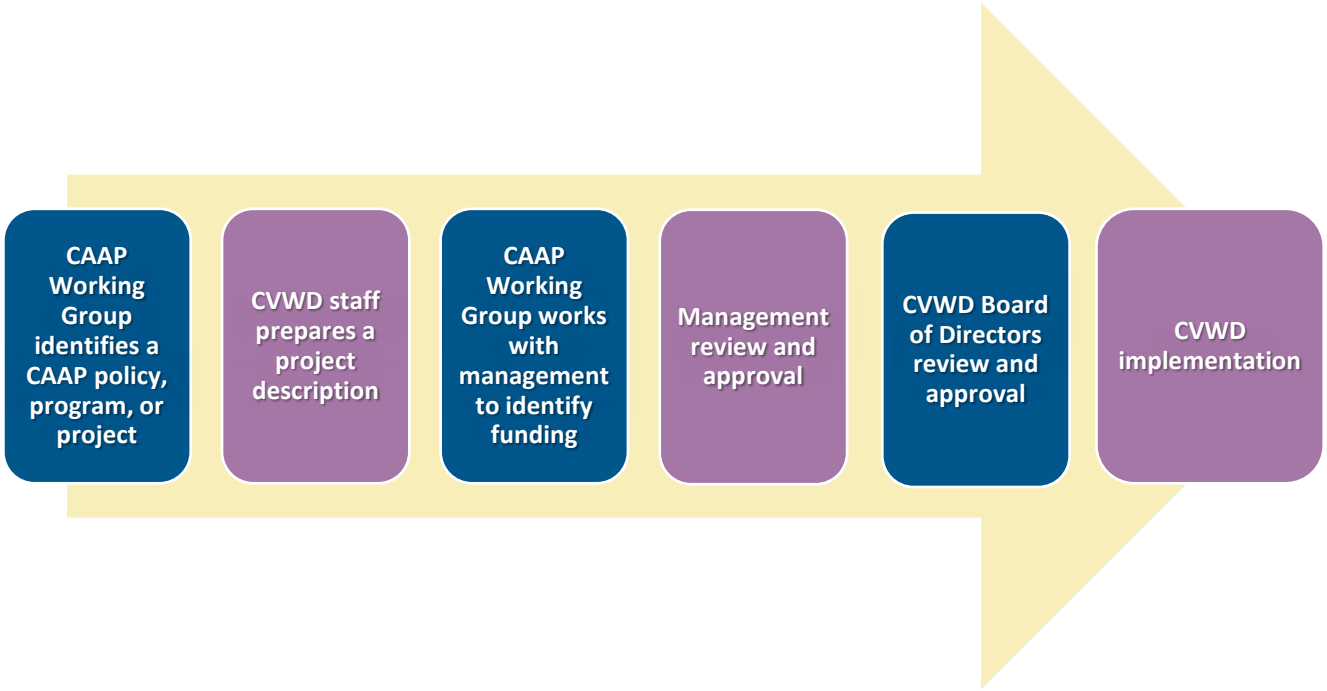
To better define the division or department responsible for CAAP implementation and monitoring, CVWD has established a CAAP Working Group. The CAAP Working Group will be primarily responsible for driving implementation and annual monitoring of the CAAP and is composed of staff from CVWD's Environmental Services Department (lead) and supported by staff from CVWD's Conservation and Communication, Engineering, Facilities and Maintenance, Operations, and Finance Departments. The inaugural 2020 CAAP Working Group convened at the start of the CAAP development process and has been responsible for evaluating the measures and actions included in this CAAP, as well as reviewing and approving each section of the CAAP document. Going forward, the CAAP Working Group will meet quarterly and will take the lead on tracking CAAP progress and educating and engaging other departments on the CAAP's implementation.



Steps for Implementation

Implementation will occur through systematic implementation of the actions identified in the CAAP, which generally contain new policies, programs, and projects that CVWD will adopt or implement to achieve the intent of the actions. The CAAP Working Group will further define these policies, programs, and projects, work with relevant departments to draft and review them, present them to CVWD's management and identify funding. As needed, proposed plans, programs, and relevant projects would be submitted to CVWD's Board of Directors to fund or adopt. Figure 6-1 provides a visual demonstration of the steps for CAAP implementation that will be managed by the CAAP Working Group.

Figure 6-1. CVWD CAAP Implementation Process



Implementation Timeline

The implementation timeframe, responsible departments, and associated performance metrics for the CAAP's measures and actions are shown in Table 6-1. Based on substantial evidence and CVWD-specific data, these measures have been developed to be capable of reducing a specific quantity of GHG emissions within a reasonable period of time, considering economic, environmental, legal, social, and technological factors (see Appendix B for more details on measure quantification). In order to achieve the 2030 GHG emissions reductions targets discussed in Section 4, CVWD will begin implementing the measures and actions as soon as possible to make real progress over the next decade.

The CAAP takes a phased approach to implementation:

- **Phase 1** will occur in the short-term over the next five years (**2021–2026**).
- **Phase 2** would include implementation of the mid-term measures to take place over the next ten years (**2021–2029**).
- **Phase 3** would include implementation of the longer-term measures, which are anticipated to occur after feasibility studies are complete and initial measures are implemented (**2030–2045**).

If the actions identified in the CAAP to meet the 2030 GHG emissions reduction milestone goal are not implemented, it is likely additional actions will need to be developed. The longer action is delayed, the more significant actions need to be taken to achieve the longer-term GHG emissions reduction targets. Some actions such as opting into a greener electricity package or replacing diesel with renewable diesel can be accomplished on a short timetable; while others, such as implementation of strategies to reduce emissions from wastewater treatment may require longer timelines to conduct a feasibility assessment, obtain funding, and roll-out any required infrastructure changes.

Table 6-1. Implementation Timeline by GHG Reduction Action

GHG Reduction Measure/ Action	Phase	Implementing Department	Implementation Metric
Measure DC-1 (Direct Combustion): Phase out natural gas combustion at CVWD facilities, such that 50% of natural gas combustion equipment is replaced with electric equivalents by 2030.			
Action DC1-1	1-2	Facilities & Maintenance, Engineering	Survey completed
Action DC1-2	1	Environmental Services, Finance	Funding identified
Action DC1-3	1-2	Facilities & Maintenance, Engineering	Natural gas usage reduced
Measure FL-1 (Fleet): Replace vehicle fleet with zero-emission vehicles as technology allows in alignment with the Advanced Clean Fleet Rule, such that by 2030, 40% of vehicle fleet are zero emissions vehicles and by 2045 100% of the vehicle fleet are zero emission.			
Action FL1-1	1	Facilities & Maintenance, Finance	Analysis completed
Action FL1-2	1	Facilities & Maintenance	Policy implemented
Action FL1-3	1	Facilities & Maintenance	Compliance documented
Action FL1-4	1-2	Facilities & Maintenance	Fuel usage reduced
Action FL1-5	1-2	Facilities & Maintenance, Finance	Grant opportunities identified; analysis completed
Measure FL-2 (Fleet): Use alternative fuels to bridge the technology gap to zero emission vehicles and off-road equipment by achieving 100% replacement of #2 diesel with 100% renewable diesel by 2030.			
Action FL2-1	1	Facilities & Maintenance	Assessment completed
Action FL2-2	1	Facilities & Maintenance	Board approval obtained
Action FL2-3	1	Facilities & Maintenance	Diesel usage reduced
Action FL2-4	1-2	Facilities & Maintenance, Communications & Conservation, Finance	Partnership identified; pilot conducted; grant opportunities identified
Action FL2-5	1	Facilities & Maintenance	Compliance documented

GHG Reduction Measure/ Action	Phase	Implementing Department	Implementation Metric
Measure FL-3 (Fleet): Reduce vehicle miles traveled and fuel use for non-ZEV/EV fleet vehicles.			
Action FL3-1	1	Facilities & Maintenance	Regular mileage and performance documented
Action FL3-2	1	Facilities & Maintenance	Maintenance documented
Measure WW-1 (Wastewater): Reduce GHG process emissions associated with wastewater treatment.			
Action WW1-1	2-3	Engineering, Facilities & Maintenance	Opportunities identified and implemented
Action WW1-2	2-3	Communication & Conservation, Operations	Partnership opportunities identified
Measure E-1 (Electricity Procurement): Utilize low-carbon and carbon-free electricity.			
Action E1-1	1	Engineering, Environmental Services, Operations	Switch to low carbon or carbon-free electricity completed
Action E1-2	1	Environmental Services	Regular analysis completed
Action E1-3	1	Engineering, Operations	Electricity usage reduced
Action E1-4	1-2	Engineering	Solar-topped parking structures installed
Action E1-5	1-2	Engineering, Operations	Opportunities identified and implemented
Action E1-6	1-2	Engineering, Operations	Opportunities identified and implemented
Measure EE-1 (Energy Efficiency): Improve energy efficiency at CVWD facilities and buildings.			
Action EE1-1	1	Facilities & Maintenance	Analysis completed; fossil fuel usage reduced
Action EE1-2	1-3	Engineering	Building energy usage reduced
Action EE1-3	1-2	Engineering	Board approval for budget for project implementation

GHG Reduction Measure/ Action	Phase	Implementing Department	Implementation Metric
Action EE1-4	1-2	Engineering	Board approval for policy obtained
Action EE1-5	1	Facilities & Maintenance	Building electricity usage reduced
Action EE1-6	1-3	Engineering	Building electricity usage reduced
Action EE1-7	1-3	Engineering, Operations, Facilities & Maintenance	Time of use program documentation
Action EE1-8	1-3	Engineering, Operations, Facilities & Maintenance	Energy efficiency projects implemented
Measure WG-1 (Waste Generation): Increase waste diversion to achieve 75% reduction in land-filled organic waste by 2025 and zero-waste by 2045.			
Action WG1-1	1	Environmental Services, Facilities & Maintenance	Waste audit conducted
Action WG1-2	1-3	Environmental Services, Facilities & Maintenance	Waste reduced
Action WG1-3	1	Environmental Services, Facilities & Maintenance	Organic waste separation program implemented
Action WG1-4	1-2	Environmental Services, Finance	Opportunities identified and implemented
Action WG1-5	1	Communications & Conservation, Environmental Services	Quarterly reports completed
Measure TR-1 (Transportation): Incentivize more sustainable commutes.			
Action TR1-1	1	Communications & Conservation	Annual surveys completed; programs identified and implemented
Action TR1-2	1	Human Resources	Rideshare incentives and results documented
Action TR1-3	1	Human Resources	Employee commute VMT reduced

GHG Reduction Measure/ Action	Phase	Implementing Department	Implementation Metric
Action TR1-4	2	Engineering	EV/EV infrastructure installed
Action TR1-5	1	Human Resources	Preferred parking expanded
Action TR1-6	1	Communications & Conservation	Education materials developed and disseminated
Measure WC-1(Water Conservation): Increase water conservation and local water supply.			
Action WC1-1	2	Communications & Conservation, Services	Program expansion documented
Action WC1-2	1	Communications & Conservation, Services	Program expansion documented; grant opportunities identified and implemented
Action WC1-3	1-2	Communications & Conservation	Analysis completed
Action WC1-4	1-2	Communications & Conservation, Facilities & Maintenance	Landscape Management Plan prepared
Action WC1-5	2	Communications & Conservation, Engineering	Policy implemented
Action WC1-6	1	Communications & Conservation, Services	Education materials developed and disseminated
Action WC1-7	2-3	Communications & Conservation, Engineering	Landscape Management Plan prepared
Action WC1-8	2	Communications & Conservation, Finance	Turf replaced
Action WC1-9	1	Communications & Conservation, Services	Program expansion documented; water conserved
Action WC1-10	1-2	Communications & Conservation, Facilities & Maintenance, Engineering, Operations	Water meters installed
Action WC1-11	3	Engineering, Operations	Opportunities identified and implemented

GHG Reduction Measure/ Action	Phase	Implementing Department	Implementation Metric
Measure CS-1 (Carbon Sequestration): Investigate and implement carbon capture and sequestration opportunities.			
Action CS1-1	1	Communications & Conservation, Services	Program expansion documented
Action CS1-2	2-3	Environmental Services	Analysis Completed
Measure CR-1 (Construction): Reduce construction-related GHG emissions by CVWD through emissions reduction controls and/or equipment requirements.			
Action CR1-1	1	Engineering	Policy adopted and implemented



CAAP MONITORING

CVWD will monitor CAAP implementation progress. Monitoring will include evaluating the CAAP implementation metrics developed for each action against CVWD operations and activities and preparing regular GHG inventory updates to track CVWD's progress against its targets. The inventory update process will also include updates to CVWD's CAPDash software, which will be used to provide transparent and regular updates to CVWD staff, stakeholders, and Board of Directors.

Over time, new technologies, State regulations, and incentives, as well as CVWD's operational conditions will all change and may impact CVWD's measures, actions, and implementation schedule. As part of the monitoring effort, the CAAP Working Group will regularly re-evaluate the measures and actions contained in the CAAP. Re-evaluation will especially consider CVWD's progress towards its targets, success of CAAP implementation so far, changes to technologies, State regulations, and other incentives for change. Upon re-evaluation, CVWD may choose to revise the measures and actions and update the CAAP.

Monitoring Timeline

The CAAP implementation metrics will be monitored on an annual basis. GHG inventory updates for the energy sector will occur annually, with evaluation of other sectors every three years. The CAAP Working Group will prepare an update on the CAAP's GHG Reduction Measures (Table 6-1) on an annual basis starting in 2022. Re-evaluation of the CAAP's measures and actions will occur approximately every five years or more frequently.

Reporting

The CAAP Working Group will report implementation monitoring results for each action, GHG inventory update results, and CAAP re-evaluation results to the Board of Directors on an annual basis.

CAPDash for Monitoring and Reporting

To facilitate implementation and monitoring of the CAAP and to minimize future CVWD staff resources needed for monitoring and reporting, CVWD will manage all implementation tracking and future GHG emissions inventories in CAPDash – a cloud based GHG inventory, monitoring, and reporting tool. The CAPDash tool will serve three purposes: generating transparent GHG inventory updates through CVWD staff's input of activity data, tracking implementation of the CAAP measures over time based on the implementation metrics identified for each action, and generating easily exportable reports for use in reporting to CVWD's Board of Directors.







GLOSSARY

Term	Definitions
AB	Assembly bill
Action	In this document the term “action” references the act, policy, or measure that will be implemented and achieved to reduce greenhouse gases.
Adaptation	The changes or process of changes a community or jurisdiction undergoes to become better suited to a changing environment.
Alternative energy	Energy derived from nontraditional sources (e.g., compressed natural gas, solar, hydroelectric, wind)
Anthropogenic	Made by people or resulting from human activities
Atmosphere	The envelope of gases surrounding the earth. These gases include nitrogen (78.1%), oxygen (20.9%), and argon, helium, GHGs, ozone, and water vapor in trace amounts
BAU	Business as usual refers to the scenario in which the entities behavior and jurisdiction operations continue on as they currently are without change.
CalRecycle	California Department of Resources, Recycling, and Recovery

Term	Definitions
CAAP	Climate action and adaptation plan
CARB	California Air Resources Board
Carbon dioxide (CO_2)	A gas produced by burning organic compounds containing carbon and by respiration
Carbon dioxide equivalent (CO_2e)	A metric measure used to directly compare emissions from various GHGs based on their global warming potential conversion factor
Carbon footprint	The total emissions caused in a year by an individual, event, organization, or product, expressed in carbon dioxide equivalent
Carbon neutrality	Achieving net-zero carbon dioxide (CO_2) emissions by balancing carbon emissions with carbon removal
Carbon Sequestration	The long-term storage or capture of carbon dioxide and other forms of carbon from the atmosphere through biological, chemical and physical processes.
CEQA	California Environmental Quality Act
Climate	The usual condition of temperature, humidity, atmospheric pressure, wind, rainfall, and other meteorological elements in an area of the earth's surface over a long period of time (typically 30 years or more)
Climate Change	A change in the average conditions – such as temperature and rainfall – in a region over a long period of time
Co-benefits	The secondary benefits that occur due to implementation of a program, measure or policy.
Decarbonization	The reduction or removal of carbon dioxide
Electrification	The process of generating power form electricity and, in many contexts, the introduction of such power by changing over from an earlier generally fossil-fuel derived power source
Emissions	The release of a substance (usually a gas when referring to the subject of climate change) into the atmosphere
EV	Electric vehicle
Fossil fuel	A general term for fuel formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils by exposure to heat and pressure in the earth's crust
GHG	Greenhouse gas. A gas that absorbs infrared radiation, traps heat in the atmosphere, and contributes to the greenhouse effect.
Greenhouse Effect	A process that occurs when gases in the Earth's atmosphere trap the Sun's heat

Term	Definitions
GWP	Global Warming Potential – total contribution to global warming resulting from the emission of one unit of that gas relative to one unit of the reference gas, carbon dioxide, which is assigned a value of 1
ICLEI	International Council for Local Environmental Initiatives
IPCC	United Nations Intergovernmental Panel on Climate Change – prepares comprehensive Assessment Reports about the stat of scientific, technical and socio-economic knowledge on climate change, its impact and future risks, and options for reducing the rate at which climate change is taking place
Methane (CH_4)	A hydrocarbon that is a greenhouse gas that is produced through anaerobic (without oxygen) decomposition of waste in landfills, wastewater treatment plants, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion
MT	Metric Ton – common international measurement for the quantity of greenhouse gas emissions – one metric ton is equal to 2,204.6 pounds or 1.1 short tons
MT CO_2e	Metric tons of carbon dioxide equivalent
Nitrous Oxide (N_2O)	A powerful greenhouse gas with a high global warming potential; major sources of nitrous oxide include soil cultivation practices, especially the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning
PV	Photovoltaic (solar energy)
Qualified GHG Reduction Plan	A Plan that meets the requirements of CEQA sections 15183.5 (b)
Scope	Categorization of GHG-generating activities based on the level of the entity's operational control of the source
SB	Senate bill
Service population	defined as residents and employees
Strategy	The plan of action and measure implementation designed to achieve greenhouse gas reduction in the community.
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
Weather	The state of the atmosphere over a short period of time (usually an hour or day)
ZEV	Zero Emission vehicle





APPENDICES



APPENDIX A: GREENHOUSE GAS INVENTORY AND FORECAST

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CVWD Climate Action & Adaptation Plan

Appendix A – Greenhouse Gas Inventory and Forecast

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June 2021

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1 Introduction

This Greenhouse Gas Inventory and Forecast Report presents the data, methods, and results for a greenhouse gas (GHG) emissions inventory and forecast for the Coachella Valley Water District (CVWD). Included is an analysis of findings and trends based on CVWD's operations which support CVWD's GHG emissions reduction targets and ultimately CVWD's first Climate Action & Adaptation Plan (CAAP). This document is Appendix A to the CAAP.

The State of California has set state-wide GHG emissions reduction goals to mitigate negative climate change[1] impacts and transition the State to a low-carbon economy. In particular, the State has set goals to reduce state-wide GHG emissions to 1990 levels by 2020, as established by Assembly Bill (AB) 32, and 40 percent below 1990 levels by 2030, as established by Senate Bill (SB) 32. The 2020 goal set by AB 32 was achieved by the State in 2016.[2]

In addition, Executive Order (EO) B-55-18 establishes a state goal of carbon neutrality by 2045. The California Air Resources Board (CARB) is the agency responsible for addressing and implementing these goals. In response, many local jurisdictions, including water districts, are completing their own GHG inventories, forecasts, and climate action plans to align with SB 32 and EO B-55-18 and contribute their fair share of GHG emissions reduction.

Water and wastewater districts play a fundamental role in reducing local GHG emissions and preparing for a more resilient future. CVWD exercises direct and indirect control over its GHG emissions-generating activities (see Section 4.2 for a definition of GHG emissions by Scope). For example, CVWD can reduce or offset energy consumption with renewable energy in its buildings and facilities and reduce or mitigate consumption in its vehicle fleet. Estimating GHG emissions in an inventory enables CVWD to quantify the major sources of GHG emissions produced by its operations and programs and establish an emissions baseline for developing a forecast. The forecast allows CVWD to estimate future emissions trends and facilitates target setting for future reductions. These will be the first GHG inventory, forecast, and reduction targets established for CVWD.

The inventory conducted for CVWD includes GHG emissions from activities under the operational control of CVWD from 2016 through 2019.[3] Based on the inventory, Rincon developed a back-cast of CVWD's GHG emissions to 1990 as well as a forecast to 2025, 2030, 2035, 2040, and 2045.

The forecast provides an up-to-date projection of how GHG emissions are expected to change for CVWD in the future based on identified capital improvement program (CIP) projects, changes in water demand, as well as existing State and federal legislation aimed at reducing GHG emissions through 2045.

This document also presents a gap analysis, which will guide CVWD's development of GHG emissions reduction measures that meet CVWD's GHG emissions reduction targets. Like all GHG inventories and forecasts, the analysis in this document relies on the best available data and calculation methodologies currently available.

[1] The National Aeronautic and Space Administration (NASA) defines climate change as "a change in the usual weather found in a place" and "a change in the earth's climate." See https://www.nasa.gov/audience/forstudents/k-4/stories/nasa-knows/what-is-climate-change-k4.html

[2] https://ww2.arb.ca.gov/news/climate-pollutants-fall-below-1990-levels-first-time

[3] CVWD elected to conduct an inventory for 2016 through 2019 as these were the most recent years for which reliable data were available. See further discussion of this in Section 4.3)

2 CVWD Operations

CVWD is a special district established by the California State Legislature and governed by a 5-member Board of Directors. CVWD was formed in 1918 to protect and conserve local water sources. Since then, CVWD has grown into a multifaceted agency that delivers irrigation and domestic (drinking) water, collects and recycles wastewater, provides regional storm water protection, replenishes the groundwater basin, and promotes water conservation. CVWD's service area covers approximately 1,000 square miles from the San Gorgonio Pass to the Salton Sea, and is the largest urban water supplier in Coachella Valley. CVWD provides drinking water to 300,000 customers, with an average daily demand of 76 million gallons per day, and wastewater service to 250,000 customers, with an average daily flow of 17 million gallons per day. Non-potable water is delivered to over 70,000 acres of primarily agricultural land and golf courses. CVWD operates a large water infrastructure system, including the following

- Two administrative campuses located in Palm Desert and Coachella
- 123-mile Coachella Canal (aqueduct that conveys Colorado River water for irrigation from the All-American Canal to the Coachella Valley)
- 135-acre canal termination and equalization reservoir known as Lake Cahuilla
- Five wastewater reclamation plants (WRPs) (WRP1, WRP2, WRP4, WRP7, and WRP10)
- 97 active wells
- 64 water distribution reservoirs
- 16 pumping plants
- 17 tributary stormwater channels spanning a total of 169 miles, as well as, the regional Whitewater River Stormwater Channel/Coachella Valley Stormwater Channel spanning 50 miles from Palm Springs to the Salton Sea
- Over 3,000 miles of pipeline, including agricultural water collection (166 miles), distribution (2,000 miles), and drainage piping
- Three groundwater replenishment facilities (Whitewater River Groundwater Replenishment Facility, Palm Desert Groundwater Replenishment Facility, and Thomas E. Levy Groundwater Replenishment Facility)

CVWD's water supplies include local groundwater from Whitewater River and the Mission Creek subbasin common water supplies, recycled water from two CVWD-owned water reclamation plants, and imported supplies from the State Water Project (SWP), through an exchange allocation with Metropolitan Water District of Southern California (MWD), and the Coachella Canal.

Water supplies are used to meet CVWD's urban and non-urban water demands and to replenish the groundwater basin. Groundwater is the principle source of domestic (drinking) water supply in the Coachella Valley and meets 100 percent of CVWD's domestic water demand. CVWD offers a number of water conservation programs, including educational and rebate programs.

3 Legislative Context

The State of California has developed State-wide legislation and programs to reduce GHG emissions in California. The State of California, via CARB, has issued several guidance documents concerning the establishment of GHG emissions reduction targets for local climate action plans to comply with legislated GHG emissions reductions goals. In the first *Climate Change Scoping Plan* (hereafter referred to as the 2008 Scoping Plan), CARB encouraged local jurisdictions to adopt a reduction target for community emissions paralleling the State commitment to reduce GHG emissions (CARB 2008). In 2017, CARB published *California's 2017 Climate Change Scoping Plan* (hereafter referred to as the 2017 Scoping Plan Update) outlining the strategies the State will employ to reach the additional State targets set by Senate Bill 32 in 2016 (CARB 2017).

Publication of the next Climate Change Scoping Plan is expected to include recommendations for complying with the carbon neutrality goal established by EO B-55-18 in 2018. While currently no State plan exists to achieve the goal set by EO B-55-18, the Executive Order directs CARB to ensure future Scoping Plan updates identify and recommend measures to achieve the carbon neutrality goal. Executive Orders are binding only unto State agencies and are not binding on local water districts, however, showing progress toward this goal is considered best practice when developing a CAAP and demonstrates consistency with State goals.

3.1 Legislative GHG Emissions Targets

The State of California has adopted legislation and policies to address climate change, the most relevant of which are summarized below. The legislative targets discussed below are further supported by sector specific legislation discussed further in the next section.

- **Executive Order S-3-05,** signed by former Governor Schwarzenegger in **2005**, establishes statewide GHG emissions reduction goals to achieve long-term climate stabilization as follows: by 2020, reduce GHG emissions to 1990 levels and by 2050, reduce GHG emissions to 80 percent below 1990 levels. The 2050 goal was accelerated by the 2045 carbon neutral goal established by EO B-55-18, as discussed below.
- **Assembly Bill 32,** signed by former Governor Schwarzenegger in **2006**, known as the Global Warming Solutions Act of 2006, requires California's GHG emissions be reduced to 1990 levels by the year 2020 (approximately a 15 percent reduction from 2005 to 2008 levels). The 2008 Scoping Plan identifies mandatory and voluntary measures to achieve the statewide 2020 GHG emissions limit.
- **Senate Bill 32,** signed by former Governor Brown in **2016**, establishes a statewide mid-term GHG emissions reduction goal of 40 percent below 1990 levels by 2030. CARB formally adopted the 2017 Scoping Plan Update in December 2017, laying the roadmap to achieve 2030 goals and giving guidance to achieve substantial progress toward 2050 State goals.
- **Executive Order B-55-18,** signed by former Governor Brown in **2018**, expanded upon EO S-3-05 by creating a statewide GHG emissions goal of carbon neutrality by 2045. EO S-55-18 identifies CARB as the lead agency to develop a framework for implementation and progress tracking toward this goal in the next Climate Change Scoping Plan Update.

3.2 Legislative Reduction Programs

In line with California's legislative goals, the State has established additional legislation and programs that will reduce GHG emissions in various sectors, such as California's Cap-and-Trade Program, Senate Bill 100, Clean Car Standards, and the Title 24 Building Standards. Some of these legislated programs are not directly relevant to CVWD and will not affect CVWD's forecasted emissions. For instance, the Cap-and-Trade and Title 24 are not anticipated to impact CVWD emissions because CVWD is not a land use agency and therefore does not construct new residential or commercial buildings and is not part of the Cap-and-Trade program. The Clean Car Standards are anticipated to have some impact on CVWD emissions, and the emissions relating the CVWD's fleet will conservatively be accounted for during the measure development stage.

The legislative program considered most relevant to CVWD's future emissions is California's Renewables Portfolio Standards (RPS) program. Established in 2002 under SB 1078, enhanced in 2015 by SB 350, and accelerated in 2018 under SB 100, California's RPS is one of the most ambitious renewable energy standards in the country. The RPS program requires investor-owned utilities, publicly owned utilities, electric service providers, and community choice aggregators to increase procurement from eligible renewable energy resources to 50 percent of total procurement by 2026 and 60 percent of total procurement by 2030. The RPS program further requires these entities to increase procurement from GHG emissions-free sources to 100 percent of total procurement by 2045. The RPS program was incorporated into CVWD's GHG forecast by adjusting the electricity emission factors based on forecasted procurement for each electricity provider.

4 GHG Emissions Inventory

This GHG emissions inventory is a significant step to understanding CVWD's GHG emissions and was specifically developed to serve the following purposes:

- Provide an understanding of where the highest sources of emissions in CVWD originate and where the greatest opportunities for emissions reductions exist
- Enable CVWD to understand the scale of GHG emissions from various sources and develop improved GHG emissions accounting and reporting principles
- Create a GHG emissions baseline from which CVWD can establish a forecast, reduction targets, and evaluate future progress
- Aid in the development of CVWD's CAAP

The methodology for calculating CVWD's inventory is consistent with standard reporting protocols from the World Resources Institute (WRI), World Business Council for Sustainable Development (WBCSD), and the International Council for Local Environmental Initiatives (ICLEI). These protocols serve to guide the measurement and reporting of GHG emissions in a standardized way and have been used by other water agencies to support their own inventory and CAAP development. They also include steps to evaluate the relevance, completeness, consistency, transparency, and accuracy of data used in the inventory and forecast. The following sections contain further information on the inventory approach, methods and data used, and results.

4.1 Greenhouse Gases

The ICLEI-Local Governments for Sustainability suggests that inventories assess GHG emissions associated with the six internationally-recognized GHGs, as outlined in Table 1 (ICLEI 2019). This inventory focuses on the three GHGs most relevant to CVWD's operations: carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The other gases (hydrofluorocarbons, perfluorocarbons, and sulfur hexafluorides) are emitted primarily in private sector manufacturing and electricity transmission and are therefore, omitted from this inventory. Table 1 also includes the global warming potentials (GWP) for each gas. The GWP refers to the ability of each gas to trap heat in the atmosphere.[4] For example, one pound of methane gas has 28 times more heat capturing potential than one pound of carbon dioxide gas. GWPs are used to equate all GHGs to CO_2 equivalent (CO_2e), GHG emissions for CVWD's GHG inventory, forecast, and targets are reported in metric tons (MT) of CO_2e, per standard practice. This inventory was prepared in conformance with International Organization for Standardization (ISO) 14064-1 and therefore, uses the latest 100-year GWP values published in the International Panel on Climate Change (IPCC) Fifth Assessment Report (IPCC 2014).[5]

[4] According to the United States Environmental Protection Agency, the GWP was developed to allow comparisons of the global warming impacts of different gases. Specifically, it is a measure of how much energy the emissions of one ton of a gas will absorb over a given period of time, relative to the emissions of one ton of carbon dioxide (EPA 2017).

[5] International Organization for Standardization (ISO) published ISO 14064-1 in 2006 (revised 2018) to provide an international standard for the quantification and reporting of GHG emissions.

Table 1 Greenhouse Gases

Greenhouse Gas	Source of Emission	Global Warming Potential
Carbon Dioxide (CO_2)	Combustion	1
Methane (CH_4)	Combustion, anaerobic decomposition of organic waste (landfills, wastewater treatment plants), fuel handling	28
Nitrous Oxide (N_2O)	Combustion and wastewater treatment	265
Hydrofluorocarbons	Leaking refrigerants and fire suppressants	4 - 12,400
Perfluorocarbons	Aluminum production, semiconductor manufacturing, HVAC equipment manufacturing	6,630 - 11,100
Sulfur Hexafluoride (SH_6)	Transmission and distribution of power	23,500

Source: IPCC Fifth Assessment Report (IPCC 2014)

4.2 GHG Emissions Sources by Scope

Standard protocols for organization-focused inventories, such as for CVWD, commonly utilize a framework that categorizes GHG emissions by scope (i.e., Scope 1, Scope 2, and Scope 3), which accounts for GHG emissions based on the level of operational control that the organization has over each GHG emissions sources. The operational control methodology is well documented by established protocols, such as the Corporate Standard GHG Protocol developed by the WRI and the WBCSD, and has been utilized by other agencies to avoid double counting of GHG emissions and conservation efforts (WRI & WBCSD 2015).

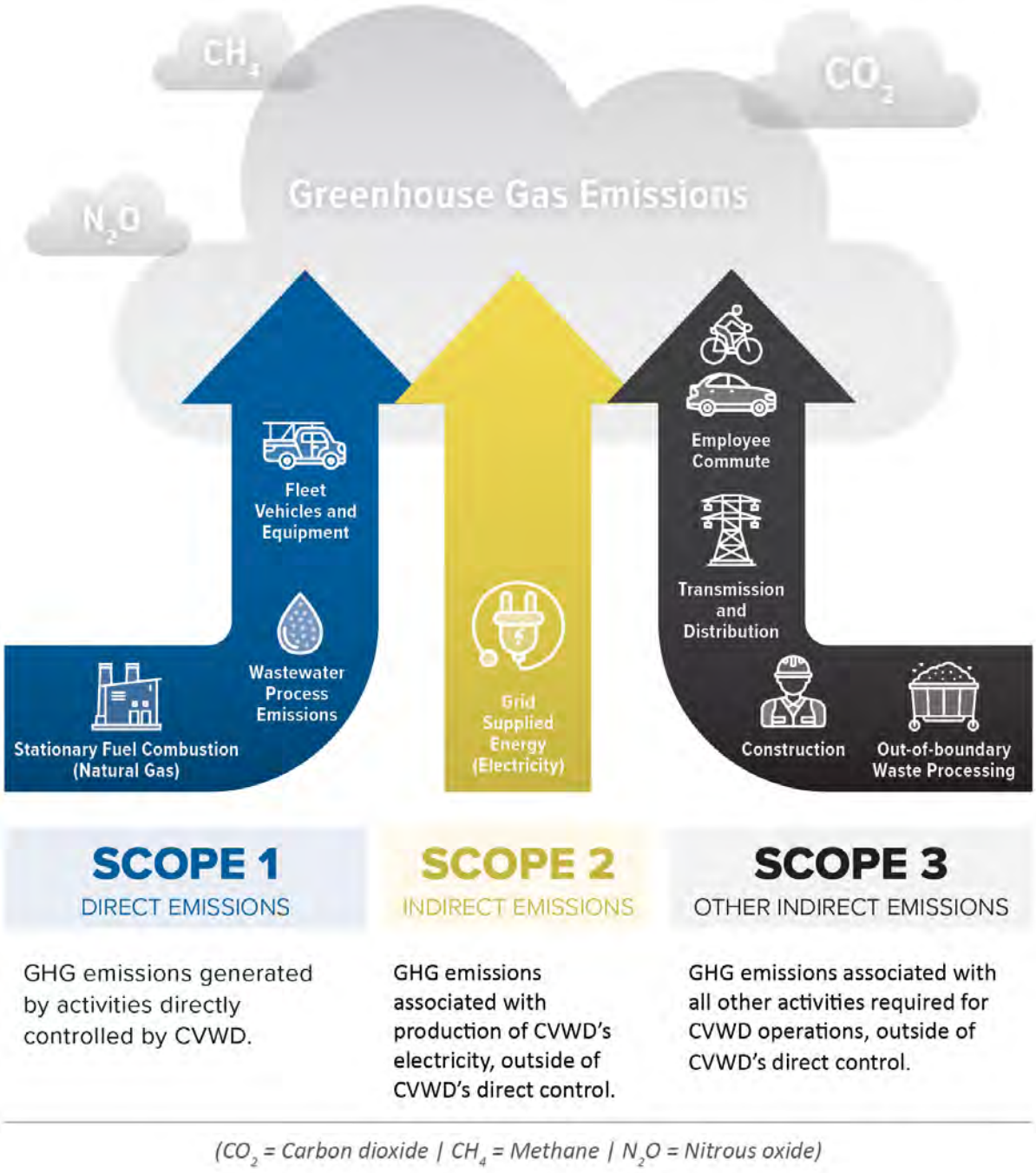
Scope 1 is defined as direct anthropogenic GHG emissions generated from sources that are owned or directly controlled by CVWD.

Scope 2 refers to GHG emissions that are indirectly generated due to the consumption of purchased electricity, steam, heating, or cooling.

Scope 3 refers to all other indirect GHG emissions not covered under Scope 2 that are associated with sources that are not directly owned or controlled by CVWD but are fundamental to the organization's operation.

A visualization of each Scope category is provided in Figure 1.

Figure 1 CVWD GHG Emissions by Scope



For consistency with standard accounting and reporting protocols, each of CVWD's GHG emissions sources were categorized by scope and included in the inventory:

- **Scope 1**
  - Natural gas – emissions from natural gas delivered by Southern California Gas
  - Vehicle fleet and equipment (on- and off-road) – vehicle fleet emissions from diesel, gasoline, compressed natural gas, and propane usage

- Generators – emissions from diesel-fueled generators[6]
- Wastewater – process emissions from wastewater reclamation plants (WRP1, WRP2, WRP4, WRP7, and WRP10) managed by CVWD

- **Scope 2**
  - Electricity – emissions from electricity delivered by Imperial Irrigation District (IID) and Southern California Edison (SCE)
- **Scope 3**
  - Electricity transmission and distribution (T&D) losses– transmission and distribution losses associated with delivered electricity from IID and SCE
  - Waste – emissions from waste generated by all CVWD office buildings and facilities
  - Employee commute – emissions from vehicles used by employees to commute to and from CVWD campuses or facilities
  - Construction – emissions associated with construction projects affecting CVWD facilities

Excluded GHG Emissions Sources

The inventory excludes some GHG emissions sources from consideration, as they were not considered relevant for CVWD operations, or were considered captured under other sectors. Refrigerants and fire suppressants were considered to be an insignificant source of GHG emissions for CVWD and therefore, were excluded from the inventory. Industrial process emissions associated with wastewater treatment were captured under Scope 1 sources for wastewater. Product emissions (i.e., CVWD provides domestic [drinking] water and irrigation water, treats wastewater, and produces recycled water) were not broken out separately, but captured under the Scope 1 and Scope 2 sources. Because no agricultural activities exist under CVWD's operational control, agricultural emissions (including enteric fermentation and manure management) were not considered relevant for CVWD and are therefore excluded. Forestry and other land emissions potentially associated with CVWD's properties were also excluded, due to limited availability of applicable data and lack of standardized methods for quantifying such emissions.

4.3 Inventory Years

The largest GHG emissions sources for water districts, including wastewater processing emissions and electricity emissions sources, tend to fluctuate year to year depending on the source of water and the extent of water demand and services provided. The variability in these emissions can make forecasting based on a single inventory year difficult. The inventory was therefore developed to include GHG emissions accounting for years 2016, 2017, 2018, and 2019, to capture and quantify some of this variability. The multi-year inventory, informed by an understanding of the variability drivers for each year, was then used to develop CVWD's GHG emissions forecast.

Current defensible methodologies for setting GHG emissions targets establish a percent reduction from 1990 emissions levels consistent with the State targets in SB 32 and EO-B-55-18. Establishing a 1990 baseline GHG inventory can be challenging granted the 30-year time lag, and standard practices in record keeping. CVWD does not have sufficient data on record to establish an activity data-based inventory for the year 1990. However, to address this issue and develop targets

[6] All fuel purchased and used for CVWD operations is tracked together via purchase records. Emissions from diesel usage for generators, on-road vehicles, and off-road vehicles were therefore reported as a lump sum.

consistent with the State, Rincon utilized the 2016 inventory to back-cast emissions for 1990. More details on the back-casting methods are provided in Section 4.7.

4.4 Activity Data and Emission factors

In general, emissions are calculated using activity data and emission factors according to the following equation:

$$Activity\ Data\ \times Emissions\ Factor = GHG\ Emissions$$

Activity data refer to the relevant measured or estimated energy use or other GHG emissions-generating process such as fuel consumption by fuel type or metered annual electricity consumption. Activity data for each year of the inventory are geographically and temporally bounded by the location (CVWD operational boundary) and year of operations (2016-2019). Emission factors are observation-based conversion factors used to equate activity data to generated emissions. Emission factors are activity-specific, and are usually expressed in terms of emissions per unit of activity data (e.g., pounds of CO_2e per megawatt-hour). The data sources used to complete this inventory are summarized by scope and source in Table 2. Unless otherwise specified, data was collected for the years 2016 through 2019, within the geographical boundary of CVWD's operations. Emission factors used and their sources are detailed under the following sections.

Table 2 Activity Data and Sources

Scope and Source	Activity Data	Unit	Data Source
Scope 1: Direct Emissions			
Natural gas	Annual natural gas usage for all CVWD buildings and facilities	therms	SCG billing history
Vehicle fleet and equipment (including generators)	Annual fuel usage (diesel, gasoline, compressed natural gas, and propane)	gallons	Fuel usage reports provided by CVWD
Wastewater processes	Annual water treated Average daily BOD for WRP1, WRP2, WRP4, WRP7, and WRP10	MG mg/L	Wastewater treatment plant tracking system
Scope 2: Indirect Emissions			
Grid Supplied Energy (Electricity)	Annual electricity usage for all CVWD buildings and facilities	kWh	IID and SCE billing history
Scope 3: Indirect Emissions			
Electricity Transmission & Distribution losses	Calculated as a percentage of electricity usage	%	Environmental Protection Agency Emissions & Generation Resource Integrated Database (eGRID)
Waste	Annual waste generated by all CVWD buildings and facilities	tons	CVWD waste disposal report

Scope and Source	Activity Data	Unit	Data Source
Employee commute	Mileage by commute method	Miles	CVWD commute surveys and employee zip code data
Construction	Activities and scale associated with each construction project completed between 2016 and 2019	various	CVWD list of construction projects and billing books

kWh = kilowatt-hours; MG/L = million gallons per liter; BOD = biochemical oxygen demand; SCG = Sothern California Gas; IID = Imperial Irrigation District; SCE = Southern California Edison

4.5 Calculation Methods and Results

Scope 1

Natural Gas

Emissions from natural gas were calculated by multiplying the activity data from the SCG billing history (therms of natural gas used by all CVWD buildings and facilities) by the emission factor for natural gas (Table 3). The emission factor for natural gas (MT CO_2e/therm) was determined based on the Environmental Protection Agency's (EPA) *Emission factors for Greenhouse Gas Inventories* document, published March 26, 2020 (EPA 2020).

Table 3 GHG Emissions from Natural Gas

Year	2016	2017	2018	2019
Activity Data (therms)	19,558	18,201	17,816	23,281
EF (MT CO_2e/therm)[1]	0.00531	0.00531	0.00531	0.00531
Emissions (MT CO_2e)	**104**	**97**	**95**	**124**

[1] EPA's Emission Factors for Greenhouse Gas Inventories

EF = emission factor

Vehicle Fleet and Equipment

Emissions from CVWD's vehicle fleet, portable equipment, and generators were calculated by multiplying the activity data from the fuel usage reports (gallons of diesel, gasoline, compressed natural gas, and propane) by the emission factor for each fuel type (Table 4). The emission factors for diesel, gasoline, compressed natural gas, and propane (MT CO_2e/gallon) were determined based on EPA's *Emission Factors for Greenhouse Gas Inventories* (EPA 2020).

Table 4 GHG Emissions from Vehicle Fleet, Equipment, and Generators

Year	2016	2017	2018	2019
Diesel				
Activity Data (gallons)	99,730	106,310	99,365	78,352
EF (MT CO_2e/gallon)[1]	0.0102	0.0102	0.0102	0.0102
Emissions (MT CO_2e)	1,022	1,089	1,018	803

Year	2016	2017	2018	2019
Gasoline				
Activity Data (gallons)	283,619	293,124	301,062	319,005
EF (MT CO_2e/gallon)[1]	0.0088	0.0088	0.0088	0.0088
Emissions (MT CO_2e)	2,499	2,583	2,653	2,811
Propane				
Activity Data (gallons)	461	514	630	674
EF (MT CO_2e/gallon)[1]	0.0057	0.0057	0.0057	0.0057
Emissions (MT CO_2e)	2.65	2.95	3.62	3.87
Compressed Natural Gas				
Activity Data (gallons)	73	82	55	45
EF (MT CO_2e/gallon)[1]	0.00000728	0.00000728	0.00000728	0.00000728
Emissions (MT CO_2e)	0.00	0.00	0.00	0.00
Total Emissions (MT CO_2e)	**3,523**	**3,675**	**3,674**	**3,617**

[1] EPA's Emission Factors for Greenhouse Gas Inventories

EF = emission factor

Wastewater Processes

CVWD operates five wastewater reclamation plants (WRPs), all of which operate using aerobic methods with varying influent loads and Biochemical Oxygen Demand (BOD_5). To quantify emissions from the WRPs (Table 5), Rincon used the activity data from CVWD (BOD load summed over all WRPs) and followed wastewater (WW) methods from ICLEI (2019):

- WW.6 to characterize process methane emissions from wastewater treatment lagoons
- WW.12.a to characterize fugitive N_2O emissions from effluent discharge to aquatic environments

Table 5 GHG Emissions from Wastewater Reclamation Plants

Year	2016	2017	2018	2019
Population Served	248,404	256,173	252,803	254,420
BOD load (kg/person)[1]	24	23	23	23
Total BOD load (kg)	5,872,104	5,952,196	5,873,894	5,808,611
FP[2]	77%	78%	78%	80%
Methane Emissions from Lagoons (MT CO_2e) [3]	18,031	17,268	17,041	15,867
N_2O Emissions from Effluent Discharge (MT CO_2e) [4]	4,822	4,973	4,908	4,939
Total Emissions (MT CO_2e)	**22,853**	**22,241**	**21,948**	**20,806**

[1] BOD data was evaluated for 2016 and 2019 only. BOD load per service person was calculated based on 2016 and 2019 data, found to be consistent, and averaged to produce BOD load per service person for 2017 and 2018.

[2] FP data was provided for 2016 and 2019 only, found to be consistent, and averaged to produce FP for 2017 and 2018

[3] Calculated using ICLEI Method WW.6

[4] Calculated using ICLEI Method WW.12.a

BOD = biochemical oxygen demand; FP = fraction of BOD removed;

Scope 2

Grid Supplied Energy (Electricity)

Emissions from electricity were calculated by multiplying the activity data from the IID and SCE billing history (kWh of electricity used by all CVWD buildings and facilities) by the emission factors for IID and SCE electricity for each year (Table 6). The emission factors for IID electricity (lbs. CO_2e/MWh) in 2016, 2017, 2018, and 2019 were provided to Rincon directly by IID. The emission factors for SCE electricity (lbs. CO_2e/MWh) in 2016, 2017, 2018, and 2019 were determined based on SCE's 2017 and 2019 Sustainability Reports (SCE 2018, SCE 2019).

Table 6 GHG Emissions from Electricity

Year	2016	2017	2018	2019
IID				
Electricity (kWh)	55,677,057	56,246,388	56,437,869	59,717,395
EF (lbs. CO_2e/MWh)[1]	861.05	875.51	598.17	484.43
Electricity Emissions (MT CO_2e)	21,746	22,337	15,313	13,122
SCE				
Electricity (kWh)	64,039,715	69,762,034	71,877,938	69,376,919
EF (lbs. CO_2e/MWh)[2]	529.00	549.00	513.00	534.00
Electricity Emissions (MT CO_2e)	15,367	17,372	16,726	16,805
Total Emissions (MT CO_2e)	**37,112**	**39,710**	**32,039**	**29,927**

[1] Provided to Rincon directly by IID

[2] Based on Edison International 2017 and 2019 Sustainability Reports (SCE 2018, SCE 2019)

EF = emission factor; kWh = kilowatt-hour; lbs. = pounds

Scope 3

Electricity T&D Losses

Electricity T&D losses were assumed to be 4.23 percent of total electricity usage in 2016 and 2017 and 4.80 percent in 2018 and 2019, based on the EPA's Emissions & Generation Resource Integrated Database (EPA 2021). Emissions from T&D losses were calculated by multiplying the calculated activity data (kWh of electricity from T&D losses) by the electricity emission factors for each year (Table 7). Similar to electricity, emissions from T&D losses were calculated separately for SCE and IID and for each year.

Table 7 GHG Emissions from Electricity T&D Losses

Year	2016	2017	2018	2019
IID				
Electricity (kWh)	55,677,057	56,246,388	56,437,869	59,717,395
T&D loss (kWh)[1]	2,355,140	2,379,222	2,709,018	2,866,435
EF (lbs. CO_2e/MWh)[2]	861.05	875.51	598.17	484.43
T&D Emissions (MT CO_2e)	920	945	735	630

Year	2016	2017	2018	2019
SCE Emissions				
Electricity (kWh)	64,039,715	69,762,034	71,877,938	69,376,919
T&D loss (kWh)[1]	2,708,880	2,950,934	3,450,141	3,330,092
EF (lbs. CO_2e/MWh)[3]	529.00	549.00	513.00	534.00
T&D Emissions (MT CO_2e)	650	735	803	807
Total Emissions (MT CO_2e)	**1,570**	**1,680**	**1,538**	**1,436**

[1] Based on EPA eGRID CAMX T&D loss factor of 4.23 percent in 2016 and 2017 and 4.80 percent in 2018 and 2019

[2] Based on Edison International 2017 and 2019 Sustainability Reports (SCE 2018, SCE 2019)

[3] Provided to Rincon directly by IID

EF = emission factor; T&D = transmission and distribution

Waste

GHG emissions associated with the waste sector result from the collection and transportation of waste to landfills, the decomposition of waste at a landfill, combustion of waste, and waste processing equipment. Emissions from waste were calculated using ICLEI method solid waste (SW).4, using the default emission factor for mixed waste and assuming operation of a landfill gas collection system (ICLEI 2019). A default 10 percent oxidation rate and 75 percent landfill gas capture rate were assumed (ICLEI 2019). Emissions generated at the landfill facilities from waste processing equipment was estimated using ICLEI method SW.5, where total tonnage of waste disposed is multiplied by the default emission factor for natural gas equipment (ICLEI 2019).

Because emissions from waste are small compared to overall emissions at CVWD, only 2016 and 2019 data was evaluated. Waste emissions for 2017 and 2018 were calculated as an average of the 2016 and 2019 results.

Table 8 GHG Emissions from Waste

Year	2016	2017	2018	2019
Landfill Emissions				
Activity Data (short tons)	32.29			73.53
EF (MT CO_2e/short ton)	0.06			0.06
Oxidation rate	0.1			0.1
LG collection rate	0.75			0.75
Emissions (MT CO_2e)[1]	12.21			27.79
Process Emissions				
Landfill Equipment	Natural gas			Natural gas
Activity Data (short tons)	32.29			73.53
EF (MT CO_2e/short ton)	0.011			0.011
Emissions (MT CO_2e)[2]	0.36			0.81
Total Emissions (MT CO_2e)[3]	**12.56**	**20.58**	**20.58**	**28.60**

[1] Calculated using ICLEI method SW.4

[2] Calculated using ICLEI method SW.5

[3] 2017 and 2018 emissions were calculated as an average of 2016 and 2019 GHG emissions from waste

EF = emission factor; LG = landfill gas

Employee Commute

Emissions from employee commute were calculated by multiplying the activity data (total mileage completed each year by passenger vehicle, motorcycle, and electric vehicle) by the emission factors for each respective vehicle type (MT CO_2e/mile for passenger vehicles and motorcycles, and kWh/mile for electric vehicles). While the mileage driven by each vehicle type was not explicitly known, Rincon calculated mileage per vehicle type based on an estimate of number of trips completed per vehicle type per week and average commute distance per employee per week. Number of trips completed per vehicle type per week was provided by CVWD as the result of a commute survey, while average commute distance per employee per week was estimated based on the provided zip codes of all employees and the assumption that each employee commutes to the CVWD campus nearest their zip code. Rincon used the CARB Emission Factor 2017 model (EMFAC2017) to estimate an emission factor (grams of CO_2e per mile) for passenger vehicles and motorcycles (CARB 2019). Rincon ran the EMFAC2017 model and calculated emission factors separately for each year inventoried.

Because employee commute was a relatively small source of emissions at CVWD, only 2016 and 2019 data was evaluated. Employee commute emissions for 2017 and 2018 were calculated as an average of the 2016 and 2019 results.

Table 9 GHG Emissions from Employee Commute

Year	2016	2017	2018	2019
Passenger Vehicles				
Passenger vehicle miles[1]	1,403,206.42			1,323,243.20
EF (g CO_2e/mile)[2]	356.33			328.78
Emissions (g CO_2e)	500,000,646.68			435,055,261.16
Emissions (MT CO_2e)	500.00			435.06
Motorcycles				
Motorcycle miles[1]	14,215.68			10,661.76
EF (g CO_2e/mile)[2]	235.60			234.61
Emissions (g CO_2e)	3,349,215.80			2,501,362.01
Emissions (MT CO_2e)	3.35			2.50
Electric Vehicles				
EV miles[1]	4,738.56			11,846.40
Electricity (kWh)[3]	1,445.26			3,613.15
EF (lbs. CO_2e/MWh)[4]	529.90			480.39
Emissions (MT CO_2e)	0.35			0.79
Total Emissions (MT CO_2e)[5]	**503.70**	**471.02**	**471.02**	**438.34**

[1] Calculated based on an estimate of number of trips completed per vehicle type per week (from commute survey) and average commute distance per employee per week (from employee zip codes)

[2] Calculated as VMT-weighted average of g $CO2_e$/mile for passenger vehicles and motorcycles provided by EMFAC2017 output for Riverside County for calendar years 2016, 2017, 2018, and 2019

[3] Calculated using a conversion factor of 0.305 kWh/mile based on a report from U.S. News (U.S. News 2018)

[4] Based on EPA eGRID CAMX emission factor

[5] 2017 and 2018 emissions were calculated as an average of 2016 and 2019 GHG emissions from waste (see Section 4.3 for a discussion of this approach)

EF = emission factor; EV = electric vehicle

Construction

Emissions from construction were calculated by multiplying the activity data (in various units) by the emission factor for each activity. Activity data was provided by CVWD for all construction projects conducted between 2016 and 2019. Emission factors were derived from various sources, including representative environmental impact reports (EIR) and the California Air Pollution Control Officers Association's (CAPCOA) California Emissions Estimator Model (CalEEMod) using the relevant project data. Table 10 includes the emission factors, calculated emissions, and calculation notes for each project type. Once total emissions were calculated over the four-year period during which the construction projects took place, an annual average emission rate was calculated by dividing the four-year total by four.

Table 10 GHG Emissions from Construction

Project Type	Count	Activity Data	Unit	EF (MT CO_2e/unit)	Emissions (MT CO_2e)	Calculation Notes
Channel repair	1	19,910	Linear feet	0.443	8,830	EF derived from representative CV Stormwater Channel Improvement EIR
Demolition	1	7.8	acres	11.318	88	EF derived from CalEEMod
Equipment replacement	2	2	projects	1,013.861	2,028	Emissions derived from representative 2017/18 and 2020/21 Non-potable water connections project Initial Studies
Facility construction	1	1	projects	841.000	841	Emissions derived from Palm Desert Groundwater Replenishment project, Phase 1 EIR
Paving	1	18,495	SF of pavement	0.000	4	EF derived from CalEEMod
Pipeline construction	25	182,402	linear feet	0.034	6,163	EF derived from representative St Anthony Mobile Home Park Water Consolidation Project Initial Study
Reservoir construction	4	23	million gallons	5.751	133	EF derived from CalEEMod
Slope construction	2	3,300	linear feet	0.409	1,349	EF derived from representative CV Stormwater Channel Improvement EIR
Small projects	4	4	projects	247.284	989	EF derived from CalEEMod
Well construction	8	18	wells	75.960	1,367	EF derived from CalEEMod
4-Year Total					**21,793**	
Annual Average					**5,448**	

EF = emission factor

4.6 Inventory Summary

Results for all GHG emissions sectors were added together to develop total GHG emissions for each year (Table 11). For all years in the inventory, electricity and wastewater were the highest contributors to CVWD's GHG emissions, followed by construction, employee commute, natural gas, and waste (Figure 2). By Scope, Scope 2 emissions were the highest, followed by Scope 1 and Scope 3 emissions (Figure 3).

Table 11 GHG Emissions Inventory Summary

Emissions Source	Scope	2016	2017	2018	2019
Vehicle Fleet and Equipment	Scope 1	3,523.36	3,674.81	3,674.29	3,617.42
Natural Gas	Scope 1	103.88	96.67	94.63	123.66
Wastewater	Scope 1	22,853.29	22,241.07	21,948.49	20,805.86
Electricity	Scope 2	37,112.19	39,709.60	32,038.77	29,926.63
T&D Losses	Scope 3	1,569.85	1,679.72	1,537.86	1,436.48
Employee Commute	Scope 3	503.70	471.02	471.02	438.34
Waste	Scope 3	12.56	20.58	20.58	28.60
Construction	Scope 3	5,448.13	5,448.13	5,448.13	5,448.13
Total		**71,126.95**	**73,341.60**	**65,233.77**	**61,825.13**

Note: all values shown are in units of MT CO_2e

Figure 2 GHG Emissions Inventory by Source (2016-2019)

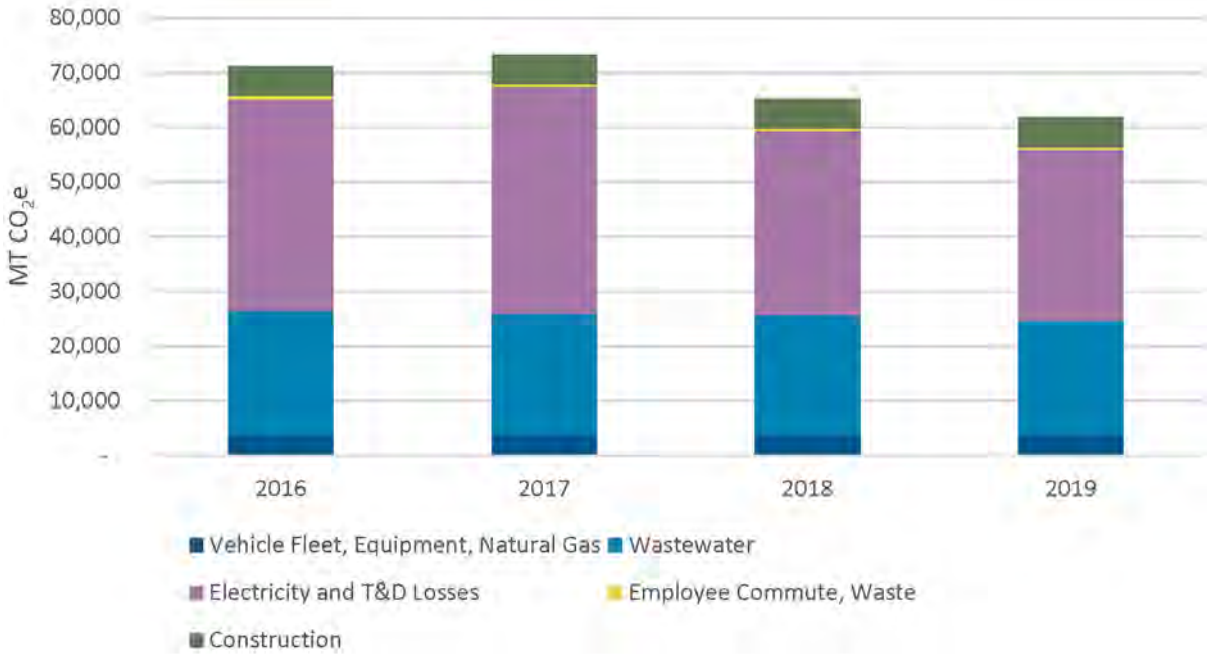
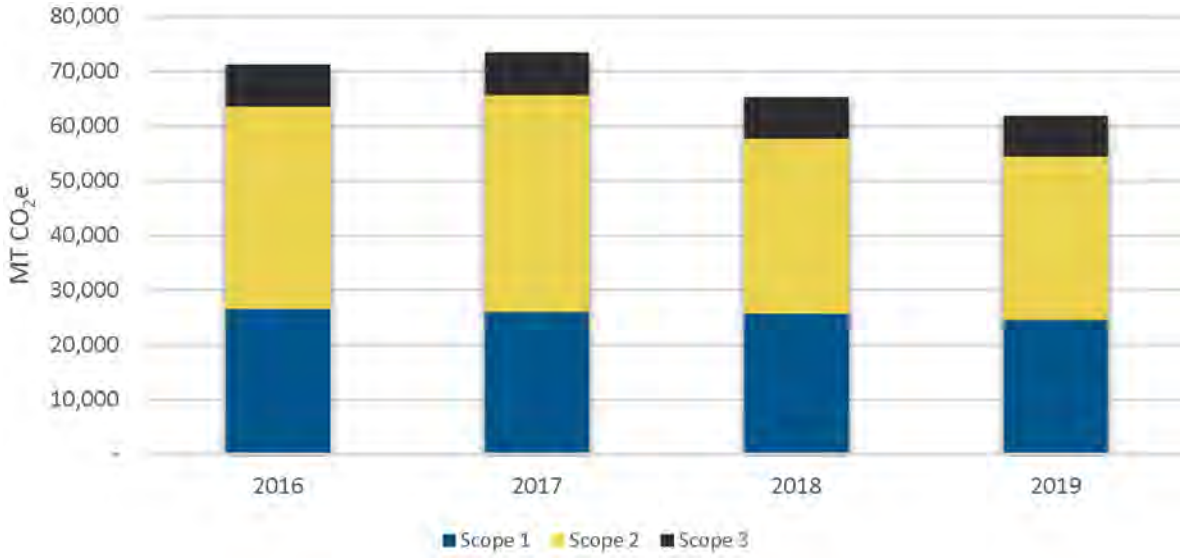


Figure 3 GHG Emissions Inventory by Scope (2016-2019)



4.7 Back-cast to 1990

Current defensible methodologies for setting GHG emissions targets establish a percent reduction from 1990 emissions levels consistent with the State goals in SB 32 and EO-B-55-18. However, most jurisdictions do not have a 1990 inventory. To address this, methods have been developed to establish a 1990 back-cast based on inventories from later years and an assumption about how much higher or lower the inventory year emissions are relative to 1990. The primary methodology back-casts from 2005-2008 data years to 1990 under the assumption that 1990 emissions levels were about 15 percent lower than 2005-2008 emissions levels for all jurisdictions in California. In the event that a 2005-2008 inventory is not available, a secondary methodology back-casts from later inventory years to 1990. The secondary methodology assumes that the jurisdiction's emissions for their later inventory year and the State's emissions for that same year have increased or decreased approximately the same percentage relative to 1990. As CVWD does not have sufficient data to establish a 1990 or 2005-2008 inventory, the secondary methodology was adopted for developing a 1990 back-cast for CVWD.

For example, CVWD emitted 71,126.95 MT CO_2e in 2016. The State emitted 287.9 million MT CO_2e in 2016 compared to 311.7 million MT CO_2e in 1990, which represents a 7.64 percent decrease between 1990 and 2016 (CARB 2016; CARB 2007).[7] This change factor was applied to CVWD's 2016 inventory emissions total to back-cast to 1990 (Table 12). Therefore, the "best available data" (i.e., the 2016 inventory) was used to determine a 1990 baseline from which to develop GHG reduction targets that are consistent with State standards. The concept of "best available data" is referenced by the Greenhouse Gas Protocol (World Resources Institute 2015).

[7] These State-level GHG emissions values exclude emissions from the industrial, agricultural, and high-GWP emissions sectors, for better comparison to CVWD's emissions inventory, which also excludes these sectors.

Table 12 1990 GHG Emissions Back-cast

Emissions	Total
State of CA 1990 Emissions (MMT CO_2e)	311.7
State of CA 2016 Emissions (MMT CO_2e)	287.9
1990 Change Factor (%)	7.64%
2016 CVWD Emissions (MT CO_2e)	71,126.95
1990 CVWD Emissions (MT CO_2e)	**76,557.88**

5 Forecast

CVWD's GHG emissions are expected to change over time due to expected changes in water demand[8] and new projects. A GHG emissions forecast accounts for these projected future changes using growth rates and extrapolates from the inventory an estimate of GHG emissions in future years, while also taking into account projected GHG emissions reduction impacts from state legislation. Calculating the difference between the forecasted GHG emissions and the reduction targets determines the gap to be closed through CVWD's CAAP and its associated GHG emissions reduction measures.

This document presents two forecast scenarios: a business-as-usual (BAU) forecast scenario and an adjusted forecast scenario. The BAU forecast scenario projects the expected growth for all GHG emissions sources based on CVWD's water service changes alone.[9] The adjusted forecast accounts for water demand changes and additionally quantifies and incorporates State legislation that is expected to help reduce CVWD's GHG emissions through 2030 and 2045, as discussed in Section 3.2. The BAU forecast, when compared to the adjusted forecast, demonstrates the extent of State-level GHG emissions reductions. However, the adjusted forecast represents a more accurate picture of future GHG emissions because it includes State legislation that will affect future emissions. The adjusted forecast is therefore used to determine the gap between the forecast and the GHG reduction targets that will need to be bridged through actions and policies in the CAAP.

5.1 Forecast Years

The forecast was developed for years 2025, 2030, 2035, 2040, and 2045, consistent with currently codified GHG emissions reduction goals at the State level, or Executive Orders which are expected to be codified in the future. The 2030 forecast year is required for consistency with SB 32, the 2045 forecast year aligns with EO-B-55-18, and the 2025, 2035, and 2040 forecast years help identify a clear path and milestone of progress toward the long-term State reduction goals.

5.2 Activity Data and Growth Factors

Data used to develop the BAU and adjusted forecasts included activity data from the 2016 through 2019 inventory, water demand data projections from CVWD's 2020 Regional Urban Water Management Plan (RUWMP), and renewables procurement projections from the relevant electricity providers as shown in Table 13 (RUWMP 2020).

[8] Expected future water demand, defined in this document as encompassing potable water demand and recycled water demand, were used to represent the future scale of all CVWD services, with the assumption that all CVWD's future services will scale approximately with water demand.

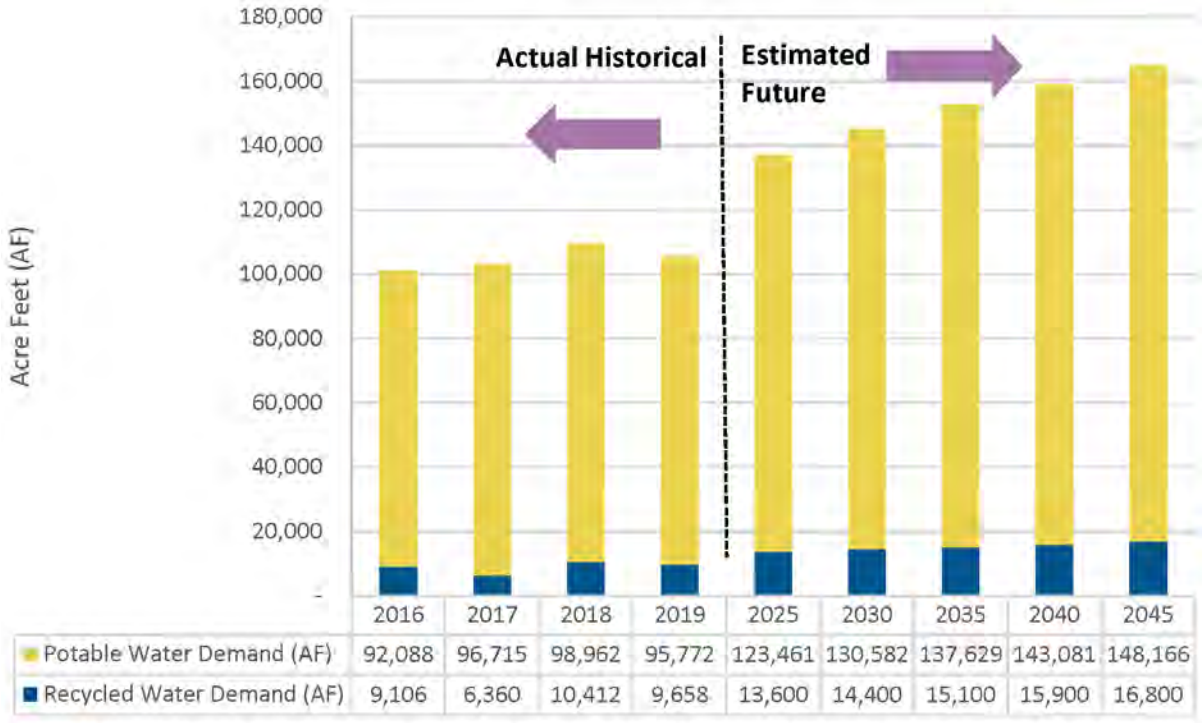
[9] The exception to this was construction emissions sources, which were kept constant through 2045, due to level of construction activity expected to stay relatively constant through 2045.

Table 13 Activity Data for Forecasting

Data	Unit	Source
Water demand	Acre-feet (AF) of water	2016-2019 data: provided directly by CVWD 2025-2045 data: **R**UWMP projections
Renewable Portfolio Standard energy mix changes	Percent	SB 100

The forecasts are primarily driven by the anticipated water demand magnitude for CVWD. For example, electricity usage by CVWD is expected to increase in future years consistent with growth in the service area and increased groundwater pumping, recycled water operations, and various groundwater replenishment activities. Historical and projected water demand data is shown in Figure 4.

Figure 4 Historical and Future Water Demand



In order to model growth in each emissions sector based on water demand projections, growth factors (e.g., electricity use per volume water demand, or kWh per AF) for each emissions sector and year were developed based on the 2016 through 2019 inventory and the water demand data for those years, then averaged across the four years (Table 14). Each growth factor was multiplied by the forecasted demand in the RUWMP to estimate future activity data values. The projected activity data was then multiplied by an emission factor to determine GHG emissions associated with the activity. While not all emissions sources (such as vehicle fleet) will scale directly with demand, this methodology provides a conservative estimate of future growth and associated CVWD emissions.

The primary exception to this methodology is the electricity and GHG emissions associated with recycled water. Water reclamation and recycling is an energy-intensive process. Per the RUWMP, CVWD plans to expand water recycling operations in future years (RUWMP 2020). This activity will

adjust CVWD's emissions profile, resulting in higher electricity usage or GHG emissions per acre-foot of water demand than currently captured by the 2016 through 2019 inventory. To account for this, Rincon developed an additional growth factor for electricity associated with recycled water (in units of kWh per AF) by dividing electricity used for water reclamation by the volume of recycled water demand. This growth factor was then multiplied by the projected recycled water demand volumes to forecast the electricity usage expected from the increase in water recycling operations. This electricity usage was added to the electricity usage already calculated for potable water demand associated with all other electricity uses, making this a conservative estimate of future emissions.

The second exception to this methodology are the GHG emissions associated with construction. Construction activity is assumed to stay relatively constant through 2045, as there is limited understanding of what future construction needs will look like in ten to 30 years. GHG emissions associated with construction were therefore kept constant through 2045, rather than scaling with water demand.

Table 14 Growth Factors for Forecasting

GHG Emissions Sector	Growth Factor	Units
Natural Gas	0.2059	Therms natural gas/AF potable water demand
Diesel	1.0011	Gallons diesel/AF potable water demand
Gasoline	3.1209	Gallons gasoline/AF potable water demand
Propane	0.0059	Gallons propane/AF potable water demand
Compressed Natural Gas	0.0007	Gallons CNG/AF potable water demand
Wastewater	0.2293	MT CO_2e/AF potable water demand
SCE Electricity (kWh)	574.6960	kWh/AF potable water demand
SCE T&D (kWh)	32.3905	kWh/AF potable water demand
SCE Electricity for Recycled Water (kWh)	1,585.4680	kWh/AF recycled water demand
IID Electricity (kWh)	427.0276	kWh/AF potable water demand
IID T&D (kWh)	26.8698	kWh/AF potable water demand
IID Electricity for Recycled Water (kWh)	1,875.1595	kWh/AF recycled water demand
Employee Commute	0.0049	MT CO_2e/AF potable water demand
Waste	7.3738	MT CO_2e/AF potable water demand
Construction	N/A	MT CO_2e/AF potable water demand

The following provides an overview of how each GHG emissions source was forecasted:

- Scope 1
  - **Natural gas** – the growth factor for natural gas was multiplied by water demand projection data for each year, then multiplied by the emission factor used in the inventory
  - **Vehicle fleet and equipment (on- and off-road)** – the growth factors for diesel, gasoline, propane, and CNG were multiplied by water demand projection data for each year, then multiplied by the corresponding emission factors used in the inventory
  - **Wastewater** – the growth factor for wastewater was multiplied by the water demand projection data for each year

- Scope 2
  - **Electricity** – the growth factors for SCE and IID electricity were multiplied by the water demand projection data for each year, then multiplied by the corresponding emission factors. For the BAU forecast, Rincon used the electricity emission factor from 2019 for each year through 2045. For the adjusted forecast, Rincon used electricity emission factors adjusted according to the projected RPS for SCE and IID
    - Additional emissions associated with increased water recycling operations were calculated by multiplying the growth factors for SCE and IID electricity associated with the WRPs by the recycled water demand projection data for each year. Activity data in kWh were converted to emissions by applying the appropriate emission factors using the same approach as described above
- Scope 3
  - **Electricity transmission and distribution losses** – established as a linear percentage of Scope 2 electricity and projected forward for the BAU and adjusted forecasts based on the BAU and adjusted Scope 2 electricity emissions projections, respectively
  - **Waste** – the growth factor for waste was multiplied by the water demand projection data for each year
  - **Employee commute** – the growth factor for employee commute was multiplied by the water demand projection data for each year
  - **Construction** – the annual average construction emissions determined from the inventory was applied for all years through 2045

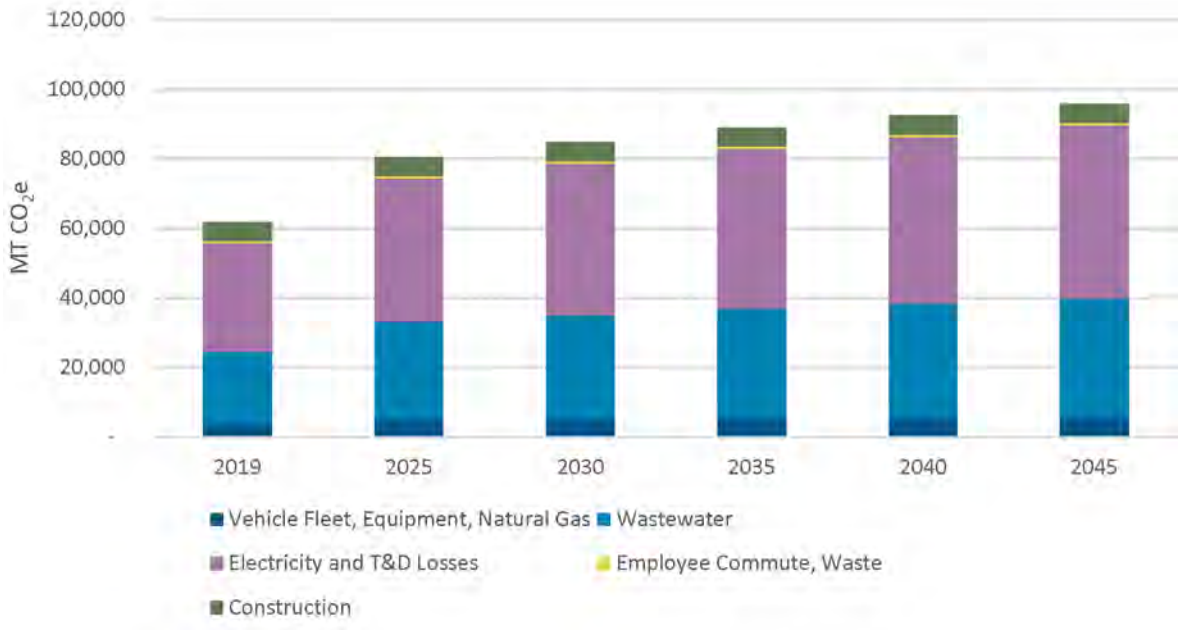
5.3 Business-as-usual Forecast Methods and Results

The BAU forecast provides an estimate of how GHG emissions would change in the forecast years if consumption trends continue as in 2016 through 2019, absent any new regulations or policies that would reduce GHG emissions. Under the BAU forecast, CVWD's emissions are projected to continue increasing through 2045 (Table 15), as CVWD services expand to meet demand from population growth. This increase is the result of the overall projected increases in population driven water demand through 2040. The results of the BAU forecast are also shown in Figure 5. Under the BAU forecast scenario, electricity and wastewater remain the highest contributors to CVWD's GHG emissions.

Table 15 Business as Usual Forecast GHG Emissions Summary (MT CO_2e)

Emissions Source	2025	2030	2035	2040	2045
Natural Gas	135	143	151	156	162
Vehicle Fleet and Equipment	4,665	4,935	5,201	5,407	5,599
Wastewater	28,308	29,941	31,557	32,807	33,973
Electricity	39,598	41,894	44,093	46,001	47,902
T&D Losses	1,698	1,795	1,892	1,967	2,037
Employee Commute	607	642	677	704	729
Waste	26	28	29	31	32
Construction	5,448	5,448	5,448	5,448	5,448
Total	**80,351**	**84,684**	**88,898**	**92,365**	**95,720**

Figure 5 Business as Usual (BAU) Forecast



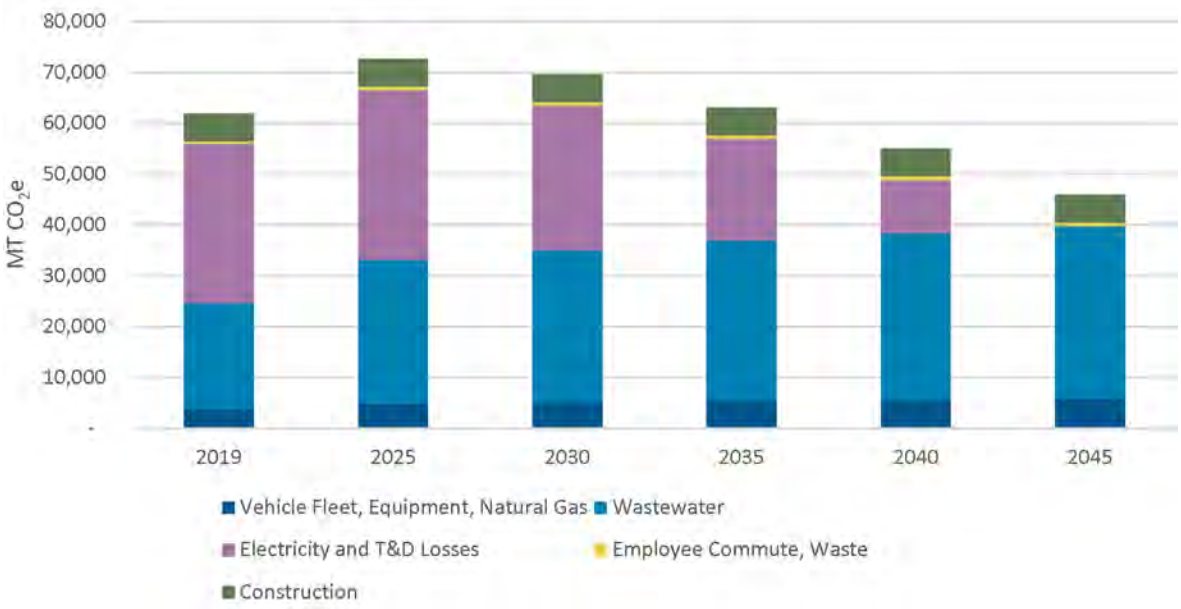
5.4 Adjusted Forecast Methods and Results

The adjusted forecast adjusts the BAU forecast to include the legislative actions and associated emissions reductions occurring at the State level as summarized in Section 3.2 (i.e., California's RPS Program). The only emissions sectors that changed under the adjusted forecast are electricity and T&D losses; all other sectors remained the same in comparison to the BAU forecast. Under the adjusted scenario, GHG emissions are expected to decrease overall through 2045 due to the adjustments to electricity (Table 16). The results of the adjusted forecast are also shown in Figure 6.

Table 16 Adjusted Forecast GHG Emissions Summary (MT CO_2e)

Emissions Source	2025	2030	2035	2040	2045
Vehicle Fleet and Equipment	4,665	4,935	5,201	5,407	5,599
Natural Gas	135	143	151	156	162
Wastewater	28,308	29,941	31,557	32,807	33,973
Electricity	32,055	25,554	17,930	9,354	0
T&D Losses	1,374	1,094	769	400	0
Employee Commute	607	642	677	704	729
Waste	26	28	29	31	32
Construction	5,448	5,448	5,448	5,448	5,448
Total	**72,484**	**67,643**	**61,611**	**54,150**	**45,781**

Figure 6 Adjusted Forecast



California RPS Program Adjustments

Projected GHG emissions from electricity and electricity T&D losses were calculated by multiplying the growth factor for each electricity source by the corresponding water demand projection for each year, and again by the corresponding emission factor. Emission factors were calculated based on the most recent emission factor for each electricity source available, which were adjusted for future years based on the RPS requirements of SB 100, as shown in Table 17.

Table 17 California RPS-adjusted Electricity Emission factors

Electricity Source	2019	2025	2030	2035	2040	2045
Renewables mix (%)						
IID[1]	42.5%	52.0%	60.0%	73.3%	86.7%	100.0%
SCE[2]	35.1%	48.7%	60.0%	73.3%	86.7%	100.0%
Emission factor (lbs. CO_2e/MWh)						
IID	484.43	404.01	337.95	225.30	112.65	0.00
SCE	534.00	422.25	289.83	193.22	96.61	0.00

[1] 2019 renewables mix and emission factor provided to Rincon directly by IID. Renewables mix projected based on SB 100 RPS requirements

[2] 2019 renewables mix and emission factor based on Edison International 2019 Sustainability Report (SCE 2019)

6 Target Setting

Once the inventory and forecast are complete, GHG emissions reduction targets are developed consistent with State goals (i.e., SB 32 and EO B-55-18). GHG targets are developed relative to baseline emissions levels, and in consideration of future emission forecasts and the effects of ongoing and future legislative actions. Because the CAAP is not a "CEQA qualified" GHG Reduction Plan (i.e., CVWD will not use the CAAP to reduce CEQA requirements for future construction and development projects), the targets that CVWD adopts are not binding but represent CVWD's best intentions with respect to GHG emissions reduction efforts. CVWD will adopt GHG reduction targets in order to define measurable benchmarks that will help guide CVWD's GHG emissions reduction efforts going forward.

Setting GHG reduction targets that additionally align with CVWD's goals will facilitate CVWD in developing its own emissions reduction trajectory. Target setting is an iterative process that should ultimately be informed by CVWD's realistic ability to achieve GHG emissions reductions through the CAAP GHG reduction measures. As such, it is considered best practice to re-evaluate the targets on a periodic basis (every five years is recommended) and adjusted as more data and information become available to CVWD.

Target pathways can be set in units of absolute emissions (total metric tons of carbon dioxide equivalents, MT CO_2e per year) or efficiency metrics (MT CO_2e per person in service territory or per capita). Based on this, four potential target pathways are discussed below:

- **SB 32 Then Carbon Neutral Target:** achieve the minimum reductions required by SB 32 by 2030 (40 percent below 1990 levels) and carbon neutrality in 2045.
  - **Absolute Pathway:** reduce absolute emissions to 40 percent below absolute emission level and to zero in 2045. This would require minimal reductions through 2030 and then relatively steep reductions from 2030 to 2045, regardless of service population changes.
  - **Efficiency Pathway:** reduce per capita emissions to 40 percent below per capita emission level in 1990 and to zero in 2045.
- **Linear to Carbon Neutral Target:** move linearly from current emission levels to carbon neutrality in 2045. This pathway is also compliant with the 2030 State goal.
  - **Absolute Pathway:** linearly reduce absolute emissions to zero in 2045. This would require consistent reductions from 2020 through 2045, regardless of service population changes.
  - **Efficiency Pathway:** linearly reduce per capita emissions to zero in 2045.

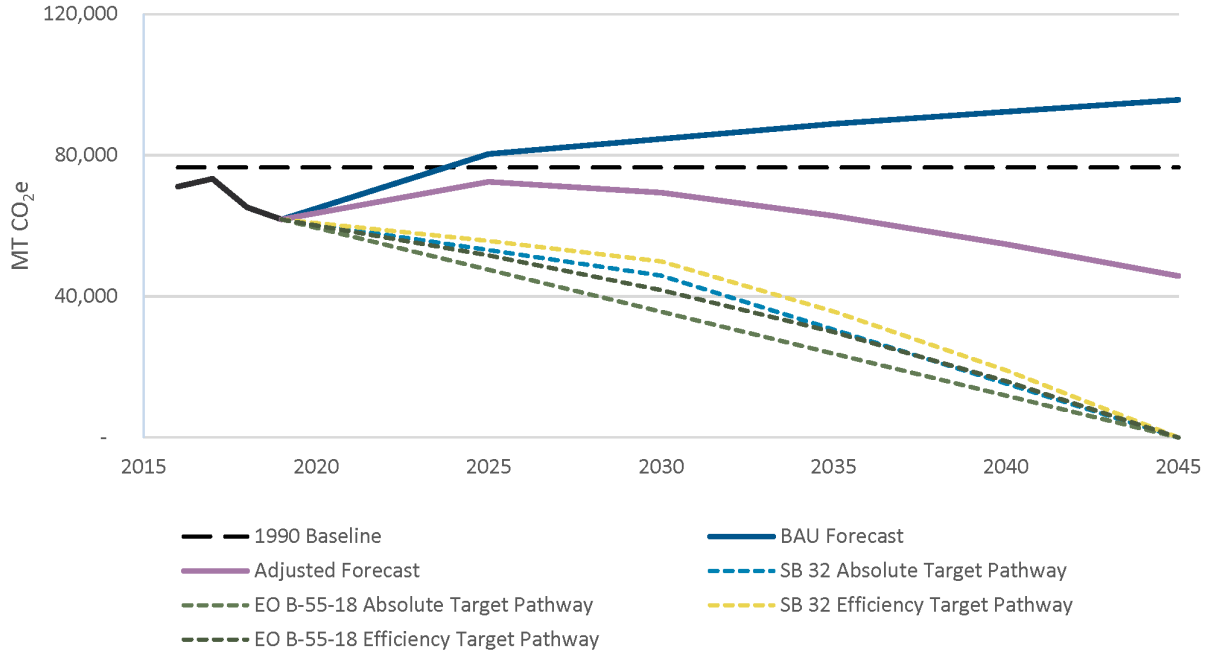
For a complete numerical comparison of each target pathway, the forecasted emissions and each potential target pathway for the years 2020, 2025, 2030, 2040 and 2045 are provided in Table 18, and represented visually in Figure 7.

Table 18 GHG Emissions Reductions Target Pathways (MT CO_2e)

	2025	2030	2035	2040	2045
Water Demand (AF)	137,061	144,982	152,729	158,981	164,966
Service Population	292,077	315,202	338,274	360,813	383,300
Absolute Emissions (MT CO_2e)					
Adjusted Forecast	72,484	67,643	61,611	54,150	45,781
SB 32 Absolute Target Pathway	53,158	45,935	30,623	15,312	0
EO B-55-18 Absolute Target Pathway	47,558	35,668	23,779	11,889	0
SB 32 Efficiency Target Pathway[1]	55,753	49,927	35,721	19,050	0
EO B-55-18 Efficiency Target Pathway	51,647	41,802	29,908	15,950	0
Per Capita Emissions (MT CO2e)					
Adjusted Forecast	0.25	0.21	0.18	0.15	0.12
SB 32 Absolute Target Pathway	0.18	0.15	0.09	0.04	0.00
EO B-55-18 Absolute Target Pathway	0.16	0.11	0.07	0.03	0.00
SB 32 Efficiency Target Pathway[1]	0.19	0.16	0.11	0.05	0.00
EO B-55-18 Efficiency Target Pathway	0.18	0.13	0.09	0.04	0.00

[1] The SB 32 efficiency target for 2030 was calculated as a 40 percent reduction from 1990 per capita emissions (calculated as total 1990 emissions divided by the 2016 service population, as provided by CVWD).

Figure 7 Target Pathways



The most stringent but steady pathway CVWD could choose would be the EO B-55-18 Absolute Target Pathway, which would require CVWD to steadily reduce emissions to zero by 2045, regardless of changes to its service population and water demand. The most flexible pathway CVWD could choose through 2030 would be the SB 32 Efficiency Target Pathway, which would allow flexibility in emissions decreases due to projected increases in service population and water

demand, but with the tradeoff that emissions reductions would need to be even more steep after 2030 in order to achieve carbon neutrality by 2045. Both the SB 32 Absolute Target Pathway and EO B-55-18 Efficiency Target Pathway offset the tradeoffs of the other two target pathway options. Rincon recommends CVWD adopt the EO-B-55-18 Efficiency Target Pathway, which offsets the tradeoffs, and would additionally protect CVWD from unanticipated increases in service population and water demand.

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APPENDIX B: REGULATORY CONTEXT

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Regulatory Context

As the impacts of climate change are becoming clearer, strategies to address climate change are emerging at all levels of government. This section provides an overview of the regulatory context at the international, state, and local levels relative to CVWD's actions toward reducing greenhouse gas (GHG) emissions.

International Climate Action Guidance

1992 United Nations Framework Convention on Climate Change

The primary international regulatory framework for GHG reduction is the United Nations Framework Convention on Climate Change (UNFCCC). The UNFCCC is an international treaty adopted in 1992 with the objective of stabilizing atmospheric GHG concentrations to prevent disruptive anthropogenic climate change. The framework established non-binding limits on global GHG emissions and specified a process for negotiating future international climate-related agreements.[1]

1997 Kyoto Protocol

The Kyoto Protocol is an international treaty that was adopted in 1997 to extend and operationalize the UNFCCC. The protocol commits industrialized nations to reduce GHG emissions per country-specific targets, recognizing that they hold responsibility for existing atmospheric GHG levels. The Kyoto Protocol involves two commitment periods during which emissions reductions are to occur, the first of which took place between 2008-2012. The second commitment period set new targets and other changes but has not been entered into force (meaning it has not gone into effect).[2]

2015 The Paris Agreement

The Paris Agreement is the first universal, legally binding global climate agreement that was adopted in 2015 and has been ratified by 191 countries worldwide.[3] The Paris Agreement establishes a roadmap to keep the world under 2 degrees Celsius (°C) of warming with a goal of limiting an increase of temperature to 1.5°C. The Paris Agreement does not dictate one specific reduction target, instead relying on individual countries to set nationally determined contributions (NDCs) or reductions based on gross domestic product and other factors. According to the International Panel on Climate Change (IPCC), limiting global warming to 1.5°C will require global emissions to reduce through 2030 and hit carbon neutrality by mid-century.[4]

[1] United Nations Framework Convention on Climate Change (UNFCCC). United Nations Framework Convention on Climate Change. https://unfccc.int/files/essential_background/background_publications_htmlpdf/application/pdf/conveng.pdf
[2] UNFCCC. What is the Kyoto Protocol? https://unfccc.int/kyoto_protocol
[3] UNFCCC. Paris Agreement - Status of Ratification. https://unfccc.int/process/the-paris-agreement/status-of-ratification
[4] IPCC. Global Warming of 1.5 C. https://www.ipcc.ch/sr15/

California Regulations and State GHG Targets

California remains a global leader in the effort to reduce GHG emissions and combat climate change through its mitigation and adaptation strategies. By the early 2000's, California was passing climate change bills including Senate Bill (SB) 1078 and Executive Order (EO) S-3-05 which began to require state agencies and utilities to address climate change. With the passage of Assembly Bill (AB) 32 in 2006, California became the first state in the nation to mandate GHG emission reductions across its entire economy. To support AB 32, California has enacted legislation, regulations, and executive orders (EO) that put it on course to achieve robust emission reductions and address the impacts of a changing climate. The following is a summary of executive and legislative actions most relevant to the Climate Action and Adaptation Plan (CAAP).

2002 Senate Bill 1078

In 2002, Senate Bill (SB) 1078 established the California Renewables Portfolio Standards (RPS) Program which requires that 20 percent of retail electricity sales be composed of renewable energy sources by 2017 and was accelerated in 2006 by SB 107,[5] which requires that 20 percent of retail electricity sales be composed of renewable energy sources by 2010, instead of 2017. EO S-14-08 was signed in 2008 to further streamline California's renewable energy project approval process and increase the state's RPS to the most aggressive in the nation requiring 33 percent renewable power by 2020.[6] SB 350, discussed further below, further accelerated the program which mandated a 50% RPS by 2030.

2002 Assembly Bill 1493

In 2002, AB 1493, also known as the Pavley Regulations, directed the California Air Resources Board (CARB) to establish regulations to reduce GHG emissions from passenger vehicles to the maximum and most cost-effective extent feasible. CARB approved the first set of regulations to reduce GHG emissions from passenger vehicles in 2004, with the regulations initially taking effect with the 2009 model year.

2005 Executive Order S-3-05

EO S-3-05 was signed in 2005, establishing statewide GHG emissions reduction targets for the years 2020 and 2050. The EO calls for the reduction of GHG emissions in California to 2000 levels by 2010, 1990 levels by 2020, and 80 percent below 1990 levels by 2050. The 2050 emission reductions target would put the state's emissions in line with the worldwide reductions needed to reach long-term climate stabilization as concluded by the IPCC *2007 Fourth Assessment Report*.

2006 Assembly Bill 32

California's major initiative for reducing GHG emissions is outlined in AB 32, the "California Global Warming Solutions Act of 2006," which was signed into law in 2006. AB 32 codifies the statewide goal of reducing GHG emissions to 1990 levels by 2020 and requires CARB to prepare a Scoping Plan that outlines the main state strategies for reducing GHG emissions to meet the 2020 deadline. In

[5] California Public Utilities Commission.2021. Renewables Portfolio Standard (RPS) Program. https://www.cpuc.ca.gov/General.aspx?id=6442463710
[6] Executive Order S-14-08. http://www.climatestrategies.us/library/library/view/292

addition, AB 32 requires CARB to adopt regulations to require reporting and verification of statewide GHG emissions.

Based on this guidance, CARB approved a 1990 statewide GHG baseline and 2020 emissions limit of 427 million metric tons of CO_2 equivalent (MMT CO_2e). The Scoping Plan was approved by CARB on December 11, 2008 and included measures to address GHG emission reduction strategies related to energy efficiency, water use, and recycling and solid waste, among other measures. Many of the GHG reduction measures included in the Scoping Plan (e.g., Low Carbon Fuel Standard, Advanced Clean Car standards,[7] and Cap-and-Trade) have been adopted since approval of the Scoping Plan.

In May 2014, CARB approved the first update to the AB 32 Scoping Plan. The 2014 Scoping Plan update defined CARB's climate change priorities for the next five years and set the groundwork to reach post-2020 statewide goals. The update highlighted California's progress toward meeting the "near-term" 2020 GHG emission reduction goals defined in the original Scoping Plan. It also evaluated how to align the state's longer-term GHG reduction strategies with other state policy priorities, including those for water, waste, natural resources, clean energy, transportation, and land use (CARB 2014).

2007 Executive Order S-1-07

Also known as the Low Carbon Fuel Standard, EO S-1-07, issued in 2007, established a statewide goal that requires transportation fuel providers to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020. EO S-1-07 was readopted and amended in 2015 to require a 20 percent reduction in carbon intensity by 2030, the most stringent requirement in the nation. The new requirement aligns with California's overall 2030 target of reducing climate changing emissions 40 percent below 1990 levels by 2030, which was set by SB 32 and signed by the governor in 2016.

2007 Senate Bill 97

Signed in August 2007, SB 97 acknowledges that climate change is an environmental issue that requires analysis in California Environmental Quality Act (CEQA) documents. In March 2010, the California Natural Resources Agency adopted amendments to the State CEQA Guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions. The adopted guidelines give lead agencies the discretion to set quantitative or qualitative thresholds for the assessment and mitigation of GHG and climate change impacts.

2008 Senate Bill 375

SB 375, signed in August 2008, enhances the state's ability to reach AB 32 goals by directing CARB to develop regional GHG emission reduction targets to be achieved from passenger vehicles by 2020 and 2035. In addition, SB 375 directs each of the state's 18 major Metropolitan Planning Organizations (MPOs), to prepare a Sustainable Communities Strategy" that contains a growth strategy to meet these emission targets for inclusion in the MPO's Regional Transportation Plan.

[7] On September 19, 2019, the National Highway Traffic Safety Agency and the U.S. Environmental Protection Agency issued a final action entitled the One National Program on Federal Preemption of State Fuel Economy Standards Rule. This action finalizes Part I of the Safer, Affordable, Fuel-Efficient (SAFE) Vehicles Rule. This rule states that federal law preempts State and local tailpipe GHG emissions standards as well as zero emission vehicle (ZEV) mandates. The SAFE Rule withdraws the Clean Air Act waiver it granted to California in January 2013 as it relates to California's GHG and zero emission vehicle programs.

In March 2018, CARB adopted updated regional targets for reducing GHG emissions from 2005 levels by 2020 and 2035. Each region was assigned a target for 2020 and 2035.[8] CVWD's operations span several of these regions.

2009 California Green Building Code

The California Green Building Standards Code (CALGreen) is Part 11 of the California Building Standards Code or Title 24 and is the first statewide "green" building code in the nation. The purpose of CALGreen is to improve public health, safety, and general welfare by enhancing the design and construction of buildings. Enhancements include higher energy efficiency, better air quality, and improved daylighting. The first CALGreen Code was adopted in 2009 and has been updated in 2013, 2016, and 2019. The CALGreen Code will have subsequent, and continually more stringent, updates every three years.

2009 Senate Bill X7-7

In 2009, SB X7-7, also known as the Water Conservation Act, was signed, requiring all water suppliers to increase water use efficiency. This legislation sets an overall goal of reducing per capita urban water use by 20 percent by2020.

2011 Senate Bill 2X

In 2011, SB 2X was signed, requiring California energy providers to buy (or generate) 33 percent of their electricity from renewable energy sources by 2020.

2012 Assembly Bill 341

AB 341 directed the California Department of Resources Recycling and Recovery (CalRecycle) to develop and adopt regulations for mandatory commercial recycling. As of July 2012, businesses are required to recycle, and jurisdictions must implement a program that includes education, outreach, and monitoring. AB 341 also set a statewide goal of 75 percent waste diversion from landfill by the year 2020.

2014 Assembly Bill 32 Scoping Plan Update

In 2014, CARB approved the first update to the Scoping Plan. This update defines CARB's climate change priorities and sets the groundwork to reach the post-2020 targets set forth in EO S-3-05. The update highlights California's progress toward meeting the near-term 2020 GHG emissions reduction target, defined in the original Scoping Plan. It also evaluates how to align California's longer-term GHG reduction strategies with other statewide policy priorities, such as water, waste, natural resources, clean energy, transportation, and land use.

2014 Assembly Bill 1826

AB 1826 was signed in 2014 to increase the recycling of organic material. GHG emissions produced by the decomposition of these materials in landfills were identified as a significant source of emissions contributing to climate change. Therefore, reducing organic waste and increasing composting and mulching are goals set out by the AB 32 Scoping Plan. AB 1826 specifically requires

8 https://ww2.arb.ca.gov/sites/default/files/2020-06/SB375_Final_Targets_2018.pdf

jurisdictions to establish organic waste recycling programs by 2016, and phases in mandatory commercial organic waste recycling over time.

2015 Senate Bill 350

SB 350, the Clean Energy and Pollution Reduction Act of 2015, has two objectives: to increase the procurement of electricity from renewable sources from 33 percent to 50 percent by 2030 and to double the energy efficiency of electricity and natural gas end users through energy efficiency and conservation.

2015 Executive Order B-30-15

EO B-30-15 was signed in 2015, establishing an interim GHG emissions reduction target to reduce emissions to 40 percent below 1990 levels by 2030. The EO also calls for another update to the CARB Scoping Plan to provide a pathway to achieve this goal.

2016 Senate Bill 32

In September 2016, the governor signed SB 32 into law, extending AB 32 by requiring the state to further reduce GHGs to 40 percent below 1990 levels by 2030 (the other provisions of AB 32 remain unchanged).

2016 Senate Bill 1383

Adopted in September 2016, SB 1383 requires CARB to approve and begin implementing a comprehensive strategy to reduce emissions of short-lived climate pollutants. SB 1383 requires achievement of the following reduction targets by 2030:

- Methane – 40 percent below 2013 levels
- Hydrofluorocarbons – 40 percent below 2013 levels
- Anthropogenic black carbon – 50 percent below 2013 levels

SB 1383 also requires CalRecycle, in consultation with CARB, to adopt regulations that achieve specified targets for reducing organic waste in landfills. SB 1383 further requires 20% of edible food disposed of at the time to be recovered by 2025.

2017 Scoping Plan Update

In December 2017, CARB adopted the 2017 Scoping Plan, which provides a framework for achieving the 2030 goal set by SB 32. The 2017 Scoping Plan relies on the continuation and expansion of existing policies and regulations, such as the Cap-and-Trade Program, as well as implementation of recently approved legislation, such as SB 350 and SB 1383.

The 2017 Scoping Plan also puts an increased emphasis on innovation, adoption of existing technology, and strategic investment to support its strategies. As with the 2014 Scoping Plan Update, the 2017 Scoping Plan does not provide project-level thresholds for land use development. Instead, it recommends that local governments adopt policies and locally appropriate quantitative thresholds consistent with statewide per capita goals of six metric tons (MT) CO_2e by 2030 and two MT CO_2e by 2050 (CARB 2017). As stated in the 2017 Scoping Plan, these goals may be appropriate for plan-level analyses (i.e., city, county, subregional, or regional level), but not for specific individual projects because they include all emissions sectors in the state (CARB 2017).

2018 Senate Bill 100

Adopted in September 2018, SB 100 supports the reduction of GHG emissions from the electricity sector by accelerating the state's RPS Program, which was last updated by SB 350 in 2015. SB 100 requires electricity providers to increase procurement from eligible renewable energy resources to 33 percent of total retail sales by 2020, 60 percent by 2030, and 100 percent by 2045.

2018 Executive Order B-55-18

In September 2018, the governor issued Executive Order B-55-18, which established a new statewide goal of achieving carbon neutrality by 2045 and maintaining net negative emissions thereafter. This goal is in addition to the existing statewide GHG reduction targets established by SB 375, SB 32, SB 1383, and SB 100.

2020 Executive Order N-79-20

In September 2020, the governor issued Executive Order N-79-20, which established a new statewide goal that 100 percent of in-state sales of new passenger cars and trucks will be zero-emissions by 2035 and that 100 percent of medium- and heavy-duty vehicles in the State be zero-emissions by 2045 for all operations where feasible. The EO further sets goal for the State to transition to 100 percent zero-emission off-road vehicles and equipment by 2035 where feasible. The EO also calls for the establishment of regulations and strategies by the California Air Resources Board to provide a pathway to achieve this goal.

Advanced Clean Fleet

The California Air Resources Board is currently developing a medium and heavy-duty zero-emission fleet regulation with a goal of all California truck and bus fleets being zero-emission by 2045. The final rulemaking is anticipated to be completed and the regulation adopted in December 2021 with implementation beginning in 2023. Under the rule public fleets, including special districts, 50% of 2024-2026 model year vehicles added to the fleet must be ZEVs and 100% of 2027 and newer model years must be ZEVs. Compliance reporting would be required annually and within 30 days of adding vehicles to the fleet.

Advanced Clean Trucks Regulation

The Advanced Clean Trucks Regulation was approved on June 25, 2020. The regulation establishes a zero-emissions vehicle sales requirement for trucks or on-road vehicles over 8,500 lbs gross vehicle weight and set a one-time reporting requirement for large entities and fleets. Under the regulation, manufacturers who certify Class 2b-8 chassis or complete vehicles with combustion engines are required to sell zero-emission trucks as an increasing percentage of their annual California sales from 2024 to 2035. By 2035, zero-emission truck/chassis sales need to be 55% of Class 2b – 3 truck sales, 75% of Class 4 – 8 straight truck sales, and 40% of truck tractor sales. Additionally, the regulation established a one-time reporting requirement for large entities and fleets where fleet owners, with 50 or more trucks, are required to report about their existing fleet operations by March 15, 2021.

APPENDIX C: MEASURE SUBSTANTIAL EVIDENCE AND REDUCTION QUANTIFICATION METHODOLOGY

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1 Introduction

Coachella Valley Water District (CVWD) has developed a Climate Action and Adaptation Plan (CAAP) to identify greenhouse gas (GHG) reduction and adaptation opportunities and improve project eligibility for State/Federal grant and loan application packages to support CVWD's Capital Improvement Programs and address climate change. As part of the CAAP, CVWD has developed a GHG emissions inventory and established GHG emission reduction targets that are in alignment with the state's GHG reduction goals established by Senate Bill (SB) 32 and Executive Order (EO) B-55-18. SB 32 establishes a statewide goal of reducing GHG emission to 40% below 1990 levels, while EO-B-55-18 identifies the long-term goal of statewide carbon neutrality by 2045. The CAAP also forecasts GHG emissions associated with CVWD operations and projected water demand. While this CAAP is not intended to serve as a qualified GHG Reduction Plan per the California Environmental Quality Act (CEQA) requirements of Section 15183.5(b), this CAAP represents CVWD's entry point into climate action planning and can be built upon during the next iterations of the CAAP.

As part of the CAAP, CVWD has identified voluntary GHG reduction and adaptation measures that have been designed to reduce GHG emissions and make substantial progress towards state's SB 32 GHG emissions reduction goals and the state's long-term GHG reduction goal of carbon neutrality (EO B-55-18). Together, these measures will reduce the gap between CVWD's forecasted GHG emissions and its GHG emissions reduction targets. The measures were selected based on their consistency with current CVWD programs and initiatives, cost effectiveness, and their ability to result in measurable GHG emissions reduction and increased resilience.

The GHG reduction and adaptation measures selected for this CAAP are designed to help reduce CVWD' GHG emissions while also improving CVWD's resiliency in light of a changing climate. Each measure outlined in the CAAP primarily focuses on the GHG emissions over which CVWD has direct operational control and on sources (e.g., emissions from construction equipment or employee commute) that generate the highest current GHG emissions. The measures are made up of action items that if implemented have quantified GHG reduction potential and clear progress tracking metrics and performance standards. Rincon worked closely with CVWD staff to craft and refine comprehensive, realistic, and achievable measures that if implemented have the potential to reduce GHG emissions in a measurable way. The quantification in this report is intended to illustrate one of several viable paths to pursue as the measures and actions of the CAAP are implemented at full scale. The GHG reductions were calculated using published evidence provided through adequately controlled third party investigations, studies, and articles carried out by qualified experts that establish the effectiveness of the measures and actions included in the CAAP. The measures and actions were developed to make substantial progress towards CVWDs 2030 target. This appendix details the data, methodology, and evidence utilized to estimate the GHG emissions reduction potential that may be achieved with full implementation of the measures and actions in this CAAP.

1.1 CVWD Greenhouse Gas Emission Reductions from Measures and Actions

This section presents an analysis of the GHG emissions reductions possible through implementation of the measures discussed herein. CVWD has organized the GHG reduction measures around three emission scopes: either direct (Scope 1) or indirect (Scope 2 and Scope 3) emissions and, twelve core measures that will systematically reduce GHG emissions across all three emission scopes.[1] The CAAP takes a phased approach to implementation. Phase 1 measures are ready for implementation over the next five years based on their cost, available technology, and certainty about future conditions. Phase 2 measures are those planned for implementation in five to ten years where more time for planning, technology advancements, or different financial conditions, such as the next phase of CIP planning, is needed before they can be implemented. Phase 3 measures are considered longer-term measures, that are anticipated to occur after feasibility studies are complete and initial measures or actions are completed.

The GHG emissions reduction from the specific actions are calculated individually and then are combined to determine the total GHG emissions reduction that can be achieved by the overall measure. Some measures and actions provide minimal or non-quantifiable GHG emissions reduction; however, they support the implementation and sustainability of the measure through internal education, funding, evaluating feasibility, and increasing resilience to the impacts of climate. These measures and actions are considered "supportive," as they do not directly result in measurable GHG emissions reduction; however, they support the overall goals of the CAAP. In addition, some measures require a series of steps or actions to be implemented or completed, prior to quantifiable GHG reductions being achieved. Other measures may require more study before implementation. These measures are thus characterized as a Phase 2 or Phase 3 and do not contribute to meeting the 2030 target. In other cases, where the quantifiable GHG reductions are dependent on the implementation of preceding measures, additional research (e.g., conduct a feasibility study) or obtaining funding, the measures and actions are listed as supportive to avoid overestimation of GHG emission reductions. Future CAAP updates will include quantification of GHG emissions reduction associated with such measures as the preceding actions are achieved. The following sections detail the methodology and assumptions used to quantify the GHG emissions reduction.

The analysis and emissions reduction calculations for each of the measures in the CAAP are outlined in the following pages and include:

- Description of the basis for GHG emissions reduction behind the measure
- Description of the methodology and assumptions for calculating GHG emissions reduction for applicable measures and actions, including reference to data sources
- Calculation of the GHG emissions reduction
- Summary table of the impact that the specific measure has on the overall 2030 GHG profile of CVWD's operations in 2030 and 2045

[1] The GHG Protocol, which is discussed in detail in *Section 3.0, GHG Emissions Inventory and Forecast,* segregates GHG emission sources into three scopes based on varying levels of control: **Scope 1 –Direct Emissions** from the activities that are directly under an organization's control, such as on-site fuel combustion from boilers, use of fleet vehicles and air-conditioning leaks; **Scope 2 – Indirect Emissions** from purchased electricity - emissions are created during the production of the electricity that is eventually used by the organization; and, **Scope 3 – All Other Indirect Emissions** from activities of the organization, occurring from sources that it does not own or control, including emissions associated with business travel, procurement, waste and water.

GHG emissions reduction calculations use conservative values to avoid over-representing the GHG emissions reduction potential for any individual measure or action. Special care has been taken to avoid double counting GHG emissions reduction for measures and actions and catagorizing them as supportive measures was used when double counting could be an issue. A summary of the potential GHG emissions reduction from each of the measures and actions by 2030 and 2045 is provided in Table 1. The actual amount of GHG emissions reduced through implementation will be dependent on the degree of implementation of each measure and the combination of measures implemented. The 2030 and 2045 GHG emissions reductions quantified in this CAAP are not yet enough to meet the CVWD's 2030 and 2045 targets. However, as the current measures and actions are implemented, CVWD will gain more information, new technologies will emerge, and current pilot projects and programs are anticipated to scale such that the gap between CVWD's target and GHG emissions forecast shrink. Furthermore, the State is expected to continue providing updated regulations and support through 2045.

Table 1 Summary of GHG Emissions Reduction from CAAP Measures and Actions

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
Measure DC1: Phase out natural gas at CVWD facilities, such that 50% of natural gas combustion equipment is replaced with electric equivalents by 2030.			
1-2	**DC1-1** Conduct a survey of natural gas and propane consuming devices in offices, control buildings, and other CVWD structures. By 2025 establish a schedule to replace non-emergency use fossil-fuel-consuming equipment with electric-powered equivalents based on operational lifespan estimates.	Supportive	
1	**DC1-2** Explore rebate, grant, or partnership opportunities to fund the replacement of fossil-fuel consuming equipment like HVAC and hot water heaters with electric powered equivalents like heat pumps.	Supportive	
1-2	**DC1-3** Based on feasibility and the replacement schedule, replace 50% of non-emergency fossil-fuel-consuming equipment with electrically powered equivalents in existing office and CVWD buildings by 2030. Additionally, with obtainment of funding establish goal to replace 75% of equipment by 2045.	55	122
Measure FL1: Replace vehicle fleet with zero-emission vehicles as technology allows in alignment with the Advanced Clean Fleet Rule, such that by 2030, 40% of the vehicle fleet are zero emissions vehicles, and by 2045, 100% of the vehicle fleet are zero emission.			
1	**FL1-1** As part of vehicle fleet replacement process, incorporate a return on investment analysis in the criteria to evaluate ZEV/EV options.	Supportive	
1	**FL1-2** Adopt an ZEV/EV First Policy for fleet vehicles so that ZEV/EVs are purchased when replacements are needed unless technological, operational, or cost effectiveness issues are identified in alignment with Executive Order B-48-18 and SB 350 transportation electrification goals. Revise policy requirements when the Advanced Clean Fleet regulation is formally adopted and implementation of Rule begins in 2023.	Supportive	

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
1	**FL1-3** Pursuant to the Advanced Clean Trucks regulation adopted June 2020, comply with the Large Entity On-Time Reporting Requirement.	Supportive	
1-2	**FL1-4** Convert 40% of the CVWD fleet to vehicles and equipment to be powered by electricity, fuel cells, and/or other ZE technologies by 2030 and aim to convert 100% of CVWD fleet to ZEV by 2045 in alignment the Advanced Clean Fleets Rule (Rule recommendation to Board December 2021; implementation begins 2023).	761	4,080
1-2	**FL1-5** Investigate grant opportunities; local, State, and federal incentives; and/or partnerships to purchase new EVs and install EV charging and/or ZEV infrastructure at facilities for fleet and public use. Conduct a return on investment analysis that assess cost savings from incentives for early replacement of fleet vehicles with ZEV/EV versus the traditional replacement schedule.	Supportive	
Measure FL2: Use alternative fuels to bridge the technology gap to zero emission vehicles and off-road equipment by achieving 100% replacement of #2 diesel with 100% renewable diesel by 2030			
1	**FL2-1** Prepare an assessment that determines the quantity of renewable diesel needed, any costs incurred from the transition, and identifies a reliable source of renewable diesel.	Supportive	
1	**FL2-2** Present findings from the assessment of transitioning from diesel to renewable diesel (Action F2-1) to Internal Stakeholders on the assessment of transitioning from diesel to renewable diesel.	Supportive	
1	**FL2-3** Transition current diesel tanks at CVWD-owned fueling depots such that 50% of diesel-powered fleet vehicles and equipment can utilize renewable diesel by 2023 and 100% by 2027.	1,066	1,210
1-2	**FL2-4** Partner with heavy-duty EV companies to conduct pilot studies and facilitate advancements in technology for vehicle classes which do not currently have viable options. Investigate grant opportunities for such projects and partnerships.	Supportive	
1	**FL2-5** Ensure any on-road diesel-fueled medium heavy-duty and heavy heavy-duty engines in CVWD's vehicles fleet are in compliance with the Fleet Rule for Public Agencies and Utilities Fleet.	Supportive	
Measure FL3: Reduce vehicle miles travelled and fuel use for non-ZEV/EV fleet vehicles			
1	**FL3-1** Upgrade current GPS systems in vehicle fleet to improve mileage tracking, track idle time, and track performance. Adjust vehicle dispatch planning and reduce idle time as necessary to reduce VMT and improve vehicle operating conditions.	300	0
1	**FL3-2** Continue to perform preventative maintenance on vehicle fleets to improve performance, including the procurement of low rolling resistance tires, using	117	0

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
	the correct tire air pressure, and regularly replacing air filters which will improve fuel efficiency.		
Measure WW1: Reduce GHG process emissions associated with wastewater treatment			
2-3	**WW1-2** Investigate opportunities associated with design features of the CVWD Master Plan for wastewater treatment facilities to reduce emissions and/or capture methane. For example, as part of proposed Capital Improvement Program (CIP) project to install two new anaerobic digesters, consider conducting a pilot study for methane capture and conversion to biofuel under the LCFS Program.	Supportive	
2-3	**WW1-2** Investigate potential partnerships with agencies or entities looking to obtain biogas for fuel production that would fund equipment costs.	Supportive	
Measure E1: Utilize Low-Carbon and Carbon Free Electricity			
1	**E1-1** Conduct an annual return on investment analysis of green electricity packages available from current electricity providers, SCE and IID, as well as from joining Desert Community Energy (DCE). Return on investment analysis should include an evaluation of electricity accounts that can be switched, estimated cost for the switch, as well as benefits from achieving greater GHG emissions reduction as it relates to grant funding opportunities associated with the CAAP. *Exceed the renewable electricity standard set by Senate Bill 100 for electricity purchases by opting into a green rate package with SCE and IID.*[1]	4,155	0.0
1	**E1-2** Continue to analyze time-of-use emissions factors and costs to better model GHG emissions and costs for future projects. Include analysis as part of annual CAAP progress monitoring.	Supportive	
1	**E1-3** When operationally feasible, schedule times of high pumping to coincide with times of high renewable energy availability and low demand to reduce GHG emissions and smooth demand curve. Establish a goal to shift 10% of pumping times to mid-day.	330	0
1-2	**E1-4** Complete the installation of solar-topped parking structures and battery storage system to cover 100% of CVWD Palm Desert Campus energy consumption needs by 2030.	1.6	0.0
1-2	**E1-5** Investigate opportunities and partnerships with fuel providers within the LCFS program associated with generating low-carbon intensity (CI) electricity from wastewater treatment plants to generate LCFS credits or power for water reclamation plant electricity needs associated with the Palm Desert Campus (i.e., WRP 10).	Supportive	
1-2	**E1-6** Investigate opportunities to reduce energy costs, improve resilience, and reduce electricity GHG emissions through additional on-site solar and	Supportive	

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
	battery storage to support CVWD operational energy use and/or investigate the cost effectiveness to enter a Power Purchase Agreement		
Measure EE1: Improve energy efficiency at CVWD facilities and buildings			
1	**EE1-1** As part of the Asset Management program, identify aging equipment due for replacement throughout CVWD facilities and identify energy efficient alternatives to use for the replacement (e.g., EnergyStar certifications). Include a return on an investment analysis as part of the replacement process that evaluates the capital investment for an energy efficient alternative piece of equipment, cost savings associated with improved energy efficiency, and identifies any grants or rebates associated with such equipment replacement.		Supportive
1-3	**EE1-2** Continue to conduct energy audits annually and implement top energy recommendations. As part of CAAP monitoring, track energy improvements due to implementation of energy audit recommendations annually.		Supportive
1-2	**EE1-3** Based on the recommendations from *Coachella Valley Water District WRP Energy Optimization Evaluation*, implement the top Energy Efficiency Measures (EEM) at WRP 4, WRP 7 and WRP 10 with a Benefit-to-Cost Ratio Greater than 1.0 by 2030. The identified EEM are aligned with the Sanitation Master Plan and include energy optimization such as aeration improvements, treatment optimization, improved site and building lighting, and addition of solar panels to the WRPs.	2,132	0
1-2	**EE1-4** Develop a policy that would require any new CVWD building to achieve a minimum level of LEED Gold certification or LEED equivalent to improve energy efficiency and reduce cost based on high return on investment greater than 20%.		Supportive
1	**EE1-5** Continue to utilize automated lighting controls for indoor/outdoor lighting for CVWD campuses pursuant to the current CEC Building Energy Efficiency Standards (Title 24, Part 6 and 11)		Supportive
1-3	**EE1-6** Pursuant to the CEC 2019 Building Energy Efficiency Standards (Title 24, Part 6 and 11), require all new construction and building upgrades utilize light emitting diode (LED) lighting technology only. Establish goal to convert all interior and exterior lighting at 50% of CVWD facilities to LED technologies by 2027 and 100% by 2035.	833	0
1-3	**EE1-7** Continue CVWD's time of use program that identifies and established permanent shifts of high-electricity use to times when renewable energy is plentiful through educational programs on energy and thermal storage, load timing/controls, pre-		Supportive

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
	cooling/pre-heating, and other time-energy demand measures.		
1-3	**EE1-8** Continue to identify opportunities to develop and profile notable energy efficiency projects. Track energy reduction from implementation of energy efficiency projects and prepare a report detailing successes for internal stakeholders by 2030.	Supportive	
Measure WG1: Increase waste diversion to achieve 75% reduction in landfilled organic waste by 2025 and zero-waste by 2045			
1	**WG1-1** Conduct a waste audit by 2023 to determine what percentage of the waste stream is organic compared with the waste stream in 2014 and therefore, subject to SB 1383.	Supportive	
1-3	**WG1-2** Expand CVWD's current waste management by developing net-zero waste policies and programs at all facilities to reduce landfilled organic waste by 75% by 2025 from 2014 levels and achieve zero landfilled waste by 2045 in alignment with AB 341 and SB 1383.	10	32
1	**WG1-3** Continue to implement organic waste diversion strategies where green and wood waste is separated from other waste streams, and sent to the Greenleaf Biomass Power Plant in Mecca or other biomass/renewable energy center.	Supportive	
1-2	**WG1-4** Investigate funding opportunities to develop an organics program and deploy organic waste bins at all CVWD facilities such that organics generated from CVWD operations is collected and diverted from the landfill by 2025.	Supportive	
1	**WG1-5** Pursuant to AB 901, report the quantity and destination of disposed biosolids from wastewater treatment plants to CalRecycle quarterly.	Supportive	
Measure TR1: Incentivize more sustainable commutes.			
1	**TR1-1** Continue to conduct annual SCAQMD transportation surveys to monitor CVWD employees needs and motivation for travelling by single occupancy vehicles versus alternatives. Based on survey results, expand or promote programs and incentives that have proven successful strategies in reducing employee VMT.	Supportive	
1	**TR1-2** Continue to offer rideshare incentives to employees who carpool. Consider offering other incentives to employees to use an alternative mode of transportation to commute (e.g. public transportation, bikes).	Supportive	
1	**TR1-3** Allow all employees located at CVWD Palm Desert and Coachella Campuses to utilize flexible 9/80 schedule through 2030 to reduce travel time, VMT, and GHG emissions.	17	12

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
	TR1-4 Conduct a ZEV/EV Feasibility Study by 2026 to investigate funding opportunities or partnerships to install ZEV/EV infrastructure at CVWD facilities and to determine the number and locations most effective for ZEV/EV infrastructure installation. Discuss with SCE their current pilot programs to install infrastructure at workplaces and evaluate future opportunities for CVWD to host pilot program.		Supportive
2	**TR1-5** Based on funding and ZEV/EV Feasibility Study, install ZEV and/or EV infrastructure to support at least a 15% transition to ZEVs/EVs by 2030 and 30% by 2045.	39	84
1	**TR1-6** Expand provided preferred parking for EV/ZEVs to incentivize use of ZEVs/EVs by employees.		Supportive
1	**TR1-7** Promote employee use of carbon-free and low carbon transportation by providing educational materials (e.g. flyers in break rooms, info on transportation survey, info on websites) on the benefits of commute options including public transportation, EV/ZEV options, and vanpools.		Supportive
Measure WC1: Increase Water Conservation and Local Water Supply			
2	**WC1-1** Expand programs which educate customers on water conservation initiatives through workshops and speaking engagements. In coordination with retail water suppliers, host regular workshops and classes on water conservation, including providing information on drought-tolerant landscaping, available rebates for water retrofits, and water efficiency strategies in new buildings. Continue to offer workshops and classes even when drought conditions are not present. Develop outreach materials for water conservation.		Supportive
1	**WC1-2** Continue to work with Agricultural Water Advisory Group to teach farm owners, managers, and irrigators concepts in irrigation water and salinity management as well as promote new technology to help the conservation effort. Apply for grant-funded agricultural rebate programs to assist those in the agriculture industry to reduce water use.		Supportive
1-2	**WC1-3** Analyze current water use reduction programs to identify which programs have the highest adoption rate and water use reduction impacts. Expand those programs which are found to be most effective.		Supportive
1-2	**WC1-4** Prepare a formal landscape management plan for CVWD that consolidates and expands upon the goals and policies for landscaping at CVWD property. The Plan should identify whether and where there are resource-consumptive landscapes on CVWD property that can be changed out to more water-conserving, slower growth plants that require less maintenance. Continue to implement potable water		Supportive

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
	conservation strategies in landscape design and maintenance (such as replacing water intensive areas with drought-resilient native plants [Bermuda grass], using low-flow water fixtures, installing sophisticated irrigation software to control water, investing in systems to monitor pipe leakage, and limiting turf development).		
2	**WC1-5** Require new or redeveloped CVWD developments to be low water use through landscaping with drought tolerant plants, permeable paving, green infrastructure, and incorporating other low-impact development design features to allow for increased infiltration, even in heavy rains.		Supportive
1	**WC1-6** Continue to promote water conservation through xeriscaping through xeriscape demonstration gardens and educational material.		Supportive
2-3	**WC1-7** Complete and implement Irrigation Master Plan that establishes goals and a timeline for improved water conservation related to irrigation. The Plan should identify the opportunities for replacement of groundwater use for irrigation with recycled water use, including a cost assessment and prioritization of opportunities.		Supportive
2	**WC1-8** Seek additional grant funding to expand the Golf Course Conservation program with a goal to remove/replace an additional 115,000 square feet of turf by 2030.		Supportive
1	**WC1-9** Continue to implement and expand on successful water conservation rebate programs (e.g., Water audits program for large water users, Residential smart controller rebate program, Commercial irrigation upgrade program, Commercial landscape rebate program, Residential landscape conversion rebate program, Commercial pre-rinse nozzle rebate program, Commercial water broom rebate program, Residential hot water recirculating pump rebate program, Commercial water efficient toilet rebate program, Residential ultra-low flush toilet replacement rebate program, Residential high efficiency washing machine rebate program) in alignment with the current Statewide water conservation goals.		Supportive
1-2	**WC1-10** Develop and adopt a schedule for installation of water meters in existing buildings and irrigation zones to establish a water consumption baseline at CVWD owned properties with the Facilities Group. Reduce CVWD water consumption per capita at facilities in alignment with the current statewide goals.		Supportive
3	**WC1-11** Investigate new advance technology systems to increase District's recycled and ground-water recovery systems to maintain local water supply (e.g.,		Supportive

Phase	Reduction Measure/Action	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
	Mid-Valley Pipeline Project). Invest in such technology as it becomes feasible and cost-effective.		
Measure CS1: Investigate and implement carbon sequestration opportunities.			
1	**CS1-1** As part of the currently CVWD published Landscape Manual, include information regarding flora and fauna CO_2 sequestration potential to promote the incorporation of landscape plants that are both low water and CO_2 sequestering. Consider vegetative options with higher CO_2 sequestration potential for CVWD facilities landscaping.		Supportive
2-3	**CS1-2** Research/evaluate the carbon sequestration potential of the CVWD Constructed Habitat Project currently in design. Develop partnerships with appropriate agencies, such as the wildlife agency, to investigate potential carbon sequestration projects to collaborate on.		Supportive
Measure CR1: Reduce construction-related GHG emissions through construction fleet requirements			
1	**CR1-1** In alignment with California' Regulation for In-Use Off-Road Diesel-Fueled Fleets, adopt a policy requiring that construction fleets average fleet index are equal to or are less than the annual fleet average target and prioritizes Tier 3 off-road diesel-powered construction equipment greater than 50 hp when equipment is available and feasible. In addition, prioritize use of construction equipment that is outfitted with BACT devices certified by CARB, and emissions control devices used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar-sized engine as defined by CARB regulations by 2023.		Supportive
CVWD Forecasted Emissions		69,425	45,781
CVWD Targets		49,927	0
Emissions Gap		19,499	45,781
Total Reductions from Measure Implementation		9,816	5,848
Remaining Gap After Measure Implementation=		9,683	39,933

Notes: MT CO2e = metric tons of carbon dioxide equivalent; ZEV/EV = zero emission vehicle/ electric vehicle

In order to define measurable benchmarks that that will align CVWD's GHG emissions reduction efforts with the state's goal for 2030 (40 percent below 1990 levels) and 2045 (carbon neutrality), CVWD must understand how their future emissions will be impacted from changes in their infrastructure and the demand from their service area. Therefore, CVWD's future GHG emissions were forecasted based on anticipated service population growth, operational changes, hydrology, and climate. Forecasted emissions calculations and details can be found in Appendix A of this CAAP. Many of the State's regulations may not directly impact CVWD, therefore, reduction adjustments from such legislation were not quantified as part of the forecast scenarios. The one exception is SB 100, which requires that all retail energy sold in California be 100 percent carbon-free by 2045 and

has had and will likely continue to have a substantial impact on CVWD's GHG emissions into the future and was accounted for in the forecasted emissions scenarios.

The combined operational reduction from the measures and actions, if implemented entirely, have been calculated to result in a potential reduction of 9,816 MT CO_2e by 2030 and 5,848 MT CO_2e by 2045 based on the assumed level of implementation. Under the forecasted scenario, CVWD would fall short of the 2030 interim target by 9,683 MT CO_2e. However, through increasing the level of implementation of Measure E1, reduction provided by the GHG reduction measures have the potential to not only fully reduce the emissions gap but exceed CVWD's emission target by approximately 12,000 MT CO_2e .[2] CVWD's targets represent the best intentions with respect to GHG emissions reduction efforts. While the measures and actions identified in this CAAP will not fully close the gap between CVWD's forecasted emissions and its GHG emission targets, implementation of the measures will lead to significant progress in reducing GHG emissions and provide a foundation for aligning with State goals. Future CAAP updates will outline new measures to further close the gap between CVWD's forecasted emissions and its GHG emission targets with increased focus on the ultimate target of carbon neutrality.[3] Although the CAAP does not provide the GHG emissions reductions to achieve carbon neutrality by 2045, it provides evidence-based actions CVWD can take towards attaining this target. It also illustrates that reaching carbon neutrality will require significant additional effort and support from the state and federal governments. The GHG emissions forecast scenarios, targets, and emissions reduction attained from the measures are provided in Table 2.

Table 2 GHG Emissions Forecasts, Reduction Targets and Impact of Reduction Measures

GHG Emissions Scenario	2030 (MT CO_2e)	2045 (MT CO_2e)[3]
Legislative Adjusted Scenario Forecast[1]	69,425	45,781
Targets (SB 32 and Carbon Neutrality)[1,2]	49,927	0
Emissions Gap	19,499	45,781
Reductions from Measures	9,816	5,848
GHG Emissions after Reductions from Measures	59,610	39,933
Remaining Gap to Meet Targets	**9,683**	**39,933[2]**
Percent Reduction Below Baseline (2016)	**22%**	**48%**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

[1] See Appendix A for the methodology and details for establishing the forecast scenarios and the reduction targets. Only SB 100 legislation is incorporated.

[2] The SB 32 efficiency target for 2030 was calculated as a 40 percent reduction from 1990 per capita emissions (calculated as total 1990 emissions divided by the 2016 service population, as provided by CVWD).

[3] The emissions reductions required to meet the 2045 goal will be addressed in future iterations of the CAAP through new and potentially unknown technologies.

[2] Elevating Measure E1 implementation to include a switch to 100% carbon-free electricity rather than the 50% greener retail packages has the potential to result in GHG emission reduction of 29,709 MT CO^2e in 2030.

[3] Consistent with AEP Climate Change Committee recommendations, SB 32 is considered an interim target toward meeting the 2045 State goal. Consistency with SB 32 is considered to be contributing substantial progress toward meeting the State's long-term 2045 goals.

2 Greenhouse Gas Emissions Reduction

The following section provides the substantial evidence and calculation details for measures and actions that are quantifiable.

2.1 Assumptions

Achievable GHG emissions reduction were quantified using a number of assumptions and developed emission factors. Emission factors, assumptions, and references used in the quantification of multiple measures are detailed here and referenced in each quantifiable measure as appropriate in the following sections.

2.1.1 Rounding of Values

As part of this document, activity data, emission factors and other calculation factors are shown within tables to provide transparency to the calculations used to quantify GHG reduction potential. Although such values are presented within this document as rounded values, the data is not rounded during the intermediary calculation steps. As such, replication of calculations presented using the rounded values may not exactly match the total GHG reduction potentials reported and some summed values in the tables may not add up exactly.

2.1.2 Electricity Emission Factors

CVWD acquires electricity from two retail providers, Southern California Edison (SCE) and Imperial Irrigation District (IID). To calculate GHG emissions from electricity consumption, the sum total of kilowatt hours (kWh) derived from a specific source is totaled and multiplied by the corresponding annual GHG emissions factor. The emission factors for IID electricity (lbs. CO_2e/MWh) in 2016, 2017, 2018, and 2019 were provided to Rincon directly by IID. The emission factors for SCE electricity (lbs. CO_2e/MWh) in 2016, 2017, 2018, and 2019 were determined based on SCE's 2017 and 2019 Sustainability Reports.[4,5] Due to the State renewable goals and associated legislation, electricity emission factors are anticipated to decrease over time. SCE and IID emission factors were assumed to achieve the Renewable Portfolio Standards (RPS) targets established by SB 100 such that in 2030, electricity will be 60 percent renewable and by 2045 electricity will be 100 percent carbon-free.[6] Based on the 2019 power content label for SCE and IID, in 2019 in 2019 IID and SCE obtained 42.5%, and 35.1% of their electricity from renewable sources, respectively,.[7,8] Assuming a linear trend, SCE and IID emission factors between 2019 and 2045 were interpolated based on the percent change in composition of the electricity that was renewable. Table 3 presents the SCE and IID emission factors and percent of renewable electricity for 2019, 2030 and 2045 that were used to interpolate annual electricity emission factor for the interim years. Based on the current split in electricity received by CVWD, where 55 percent of power is from SCE and 45 percent is from IID, a weighted emission factor was developed. For the purposes of quantifying the potential GHG emission reductions by the

[4] https://www.edison.com/content/dam/eix/documents/sustainability/eix-2017-sustainability-report.pdf
[5] https://www.edison.com/content/dam/eix/documents/sustainability/eix-2019-sustainability-report.pdf
[6] SB 100 established a landmark policy requiring renewable energy and zero-carbon resources supply 100% of electric retail sales to end-use customers by 2045. SB 100 also sets in interim target of 60% renewable or carbon-free electricity by 2030.
[7] https://www.iid.com/energy/renewable-energy/power-content-label
[8] https://www.sce.com/sites/default/files/inline-files/SCE_2019PowerContentLabel.pdf

below described measures, it was assumed that the allocation of energy received from each retail provider would remain consistent over time.

Table 3 Electricity Emission Factors

Electricity Source[1]	2019	2030	2045
IID (retail)			
Standard Percent Renewable Sources[1,2]	42.5%	60%	100%
Standard Emission Factor (MT CO_2e/MWh)[3]	0.220	0.153	0.0
50% Green Energy Program Percent Renewable Sources[4]	50%	69%	100%
50% Green Energy Program Emission Factor (MT CO_2e/MWh)[5]	0.203	0.139	0.0
SCE (retail)			
Standard Percent Renewable Sources[1,2]	35.1%	60%	100%
Standard Emission Factor (MT CO_2e/MWh)[3]	0.242	0.149	0.0
50% Green Rate Percent Renewable Sources[4]	67.5%	80%	100%
50% Green Rate Emission Factor (MT CO_2e/MWh)[5]	0.164	0.120	0.0
Weighted Emission Factors[6]			
Emission Factor (MT CO_2e/MWh)	0.232	0.151	0.0
50% Green Rate Emission Factor (MT CO_2e/MWh)	0.181	0.129	0.0

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; MWh =-megawatt-hour; RPS = Renewable Portfolio Standard

[1] Renewable sources are considered hydro, biomass, wind, solar and geo-thermal sources. Carbon-neutral includes the listed renewables as well as nuclear sources.

[2] Standard package IID and SCE forecasted portfolios are based on RPS targets of 60% renewable sources by 2030 and carbon-neutral by 2045.

[3] Emission factors in 2030 for SCE and IID were calculated based on the 2019 emission factors and 2019 renewable portfolio for each retail provider where in 2019 IID and SCE obtained 42.5%, and 35.1%, respectively, of electricity from renewable sources. As such, to meet SB 100 requirements IID and SCE would increase their portfolio of renewably sourced electricity by 17.5% and 24.9%, respectively. It was assumed that the 2030 emission factors would decrease to the same degree.

[4] Renewable electricity composition in 2030 for IID's 50% Green Energy Program and SCE's 50% Green Rate Program is based on composition of carbon-free sources that currently exist in those programs and an assumed linear trend to 100% carbon neutral by 2045. In 2019, SCE's 50% Green Rate option provided 67.5% eligible renewable energy (https://www.sce.com/sites/default/files/inline-files/SCE_2019PowerContentLabel.pdf) and IID's 50% Green Energy Program option provided 50% eligible renewable energy (https://www.iid.com/energy/renewable-energy/power-content-label).

[5] Emission factors for the IID 50% Green Energy Program and SCE 50% Green Rate were calculated based on the 2019 standard rate emission factor and the percent difference between the renewable portfolio of the standard rate package versus the renewable portfolio package for the 50% greener packages as described in note 4.

[6] Approximately 45% of CVWD's overall electricity comes from IID and 55% from SCE. A weighted emission factor for CVWD was developed assuming this ratio remained consistent over time.

Both SCE and IID offer cleaner energy options where a higher percentage of the electricity sourced is renewable or carbon-free than the standard rate option. In 2019, SCE's 50 percent Green Rate option provided 67.5 percent eligible renewable energy and IID's 50 percent Green Energy Program option provided 50 percent eligible renewable energy.[8,9] Renewable electricity composition and the corresponding emission factor in 2030 for IID's 50 percent Green Energy Program and SCE's 50 percent Green Rate Program is based on composition of renewable sources that currently exist in those programs and an assumed linear trend to 100 percent carbon-free by 2045. As such, by 2030 SCE's 50 percent Green Rate Program is anticipated to be approximately 80 percent renewable sources, 20 percent greater than the SB 100 required 60 percent, and IID's 50 percent Green Energy

[9] https://www.iid.com/home/showpublisheddocument/17257/636747759993730000

Program is anticipated to be 69 percent renewable, 9 percent greater than the SB 100 required 60 percent. Emission factors for SCE and IID were assumed to directly correlate with the changes in percent of renewable sources. As such, it was assumed that emission factors for SCE and IID would decrease from the calculated 2030 standard package emission factor by approximately 20 percent and 9 percent, respectively.

For measures or actions that are associated with electrification, the level of GHG emissions savings that is achievable is dependent on the power mix of the provided electricity. Changes in assumptions regarding power mix of purchased electricity, such as upgrading to electricity that is 100 percent carbon -free, will significantly change the electricity emission factor. As such, GHG emission reductions quantified in the following section are subject to change if the assumptions regarding electricity procurement change.

2.2 Scope 1: Direct Combustion

Measure DC1: Phase out natural gas at CVWD facilities, such that 50% of natural gas combustion equipment is replaced with electric equivalents by 2030.

Natural gas and other fossil fuels combusted in CVWD's buildings and facilities emit approximately 100 MT of CO_2e per year. While natural gas and other fossil fuels are not the most substantial source of emissions, natural gas-powered equipment can be replaced with renewable fuel alternatives such as electric options over time as the equipment reaches the end of its useful life. Many electric counterpart appliances, such as heat pumps, are more efficient than those powered by natural gas. California adopted SB 100 in 2018, making electrification an important strategy for reducing GHG emissions. SB 100 requires that all retail energy sold in California be 100 percent carbon-free by 2045; therefore, electrifying a fossil fuel source means that piece of equipment will also be carbon-free by 2045. In addition to GHG emissions reduction, removing natural gas from facilities would also improve indoor and local outdoor air quality by reducing atmospheric particulate matter less than 2.5 micrograms in size ($PM_{2.5}$).[10]

Methodology and Assumptions

ACTION DC1-1: CONDUCT A SURVEY OF NATURAL GAS AND PROPANE CONSUMING DEVICES IN OFFICES, CONTROL BUILDINGS, AND OTHER CVWD STRUCTURES. BY 2025 ESTABLISH A SCHEDULE TO REPLACE NON-EMERGENCY USE FOSSIL-FUEL-CONSUMING EQUIPMENT WITH ELECTRIC-POWERED EQUIVALENTS BASED ON OPERATIONAL LIFESPAN ESTIMATES. (SUPPORTIVE)

Action DC1-1 would incrementally support the measure through ensuring that all natural gas and other fossil fuel consuming equipment are identified. Also, identifying cost-effective equipment replacements improves the feasibility of the strategy and allows for equipment replacements to be prioritized and planned for so when equipment fails, a replacement is already identified. Further, strategic planning such as the establishment of a replacement schedule and budget helps ensure successful implementation of Measure DC- 1.

[10] https://www.nrdc.org/experts/pierre-delforge/gas-appliances-pollute-indoor-and-outdoor-air-study-shows

ACTION DC1-2: EXPLORE REBATE, GRANT, OR PARTNERSHIP OPPORTUNITIES TO FUND THE REPLACEMENT OF FOSSIL-FUEL CONSUMING EQUIPMENT LIKE HVAC AND HOT WATER HEATERS WITH ELECTRIC POWERED EQUIVALENTS LIKE HEAT PUMP. (SUPPORTIVE)

Action DC1-2 would incrementally support the measure through aiding in the funding mechanism for equipment replacements. In addition to active replacement of stationary combustion equipment fueled by natural gas, this supporting measure would further the phasing out of natural gas use at CVWD facilities for future projects.

ACTION DC1-3: BASED ON FEASIBILITY AND THE REPLACEMENT SCHEDULE, REPLACE 50% OF NON-EMERGENCY FOSSIL-FUEL-CONSUMING EQUIPMENT WITH ELECTRICALLY POWERED EQUIVALENTS IN EXISTING OFFICE AND CVWD BUILDINGS BY 2030. ADDITIONALLY, WITH OBTAINMENT OF FUNDING ESTABLISH GOAL TO REPLACE 75% OF EQUIPMENT BY 2045.

Direct GHG emissions reduction for this strategy are dependent on the active removal of fossil fuel combustion. Therefore, for the purposes of this calculation, it is assumed that through the implementation of this action, CVWD will aim to replace 50 percent of natural gas consuming equipment by 2030 and 75 percent by 2045 through electrification of current equipment. The emissions reduction calculation assumes that equipment replacement will begin starting in 2022.

Natural gas consumption reduced in the target year (i.e., 2030 and 2045) was calculated as the forecasted natural gas consumption multiplied by the percent equipment replacement goal. For this calculation, it was assumed the replacement of natural gas consuming equipment would occur in a linear trend starting in 2022 to the target year (i.e., 2030 and 2045) with the goal of 50 percent of natural gas consuming equipment would be replaced by 2030 and 75 percent by 2045. The reductions of natural gas consumption by the target date are multiplied by the U.S. EPA emission factor of 0.00531 MT CO_2e/Therms to determine the natural gas emissions avoided by the target year, i.e., 2030 and 2045, respectively.

Space heating is the largest energy use in buildings and is dominated by non-electric fuels.[11] According to the United States Energy Information Administration (EIA) *2020 Annual Energy Outlook,* electric heat pumps for commercial space heating and cooling are two to five times more efficient than natural gas fueled equipment.[12] Emissions reduction related to this increased efficiency are accounted for by conservatively assuming replacement of natural gas fueled equipment with electric equipment will be three times more efficient than natural gas fueled equipment. Since electric appliances are approximately three times more efficient over similar natural gas burning equipment and appliances,[13] the use of electric equipment instead of natural gas would result in improved energy efficiency and a reduction in overall energy consumption for replaced natural gas equipment; however, achievable emissions reduction would be minimized assuming full implementation of Measure E-1, specifically the switch of retail accounts to the 50% Green Rate option for retail electricity sources by 2022. Therefore, it was assumed that natural gas sources would be replaced by electric equipment that is 300 percent more efficient and that Measure E-1 would be implemented by 2022 further reducing electricity emissions post-2022. The

[11] Deason, Jeff, et al. 2018. Electrification of buildings and Industry in the United States. pp.10. https://pdfs.semanticscholar.org/27f0/d125d5316ee10565560545c0fc17d6c447a8.pdf?_ga=2.3238896.1101123906.1590438648-1004765093.1590438648. Accessed May 25th, 2020.

[12] EIA. 2020. Annual Energy Outlook. Table 22. Commercial Sector Energy Consumption, Floorspace, Equipment Efficiency, and Distributed Generation. https://www.eia.gov/outlooks/aeo/data/browser/#/?id=32-AEO2020&cases=ref2020&sourcekey=0. Accessed May 25th, 2020.

[13] Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019

electricity consumption would generate GHG emissions that would offset some of the reduction in natural gas emissions from electrification. The calculations and assumptions used to estimate emissions reduction from Action DC1-3 are provided in Table 4.

Table 4 Action DC1-3 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Equipment Replacement Goal[1]	50%	75%
Forecasted NG Consumption (Therms)[2]	26,890	30,511
Natural Gas Consumption Reductions (Therm)[3]	13,445	22,883
Natural Gas Emission Factor (MT CO_2e/Therm)[4]	0.00531	0.00531
Natural Gas GHG Emissions Avoided (MT CO_2e)	71	122
Increase in Electricity Consumption (MWh)[5,6]	131	223
Weighted Electricity Emission Factor Assuming Implementation of Measure E-1 (MT CO_2e/MWh)[7,8]	0.129	0.0
Additional GHG Emissions from Increased Electricity Consumption (MT CO_2e)	17	0.0
Avoided GHG Emissions (MT CO_2e)[9]	**55**	**122**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; MMBtu = one million British thermal units; kWh =kilowatt-hour; RPS = Renewable Portfolio Standard

Values have been rounded and may not add up exactly.

[1] It was assumed that the replacement of natural gas consuming equipment would occur in a linear trend starting in 2022 to the target year (i.e., 2030 and 2045) where 50% of natural gas consuming equipment would be replaced by 2030 and 75% by 2045.

[2] Annual natural gas consumption is forecasted through future years based on CVWD data reported for the 2016 - 2019 inventory, provided in Appendix A.

[3] Total natural gas reduction is calculated as the equipment replacement goal multiplied by the overall forecasted natural gas consumption in the target years (i.e., 2030 and 2045).

[4] Emission factors obtained from U.S. EPA Emission Factors for Greenhouse Gas Inventories, Table 1. https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf

[5] Natural gas consumption converted to electricity using the conversions: 1 MMBtu = 0.10 therm; 1 Therm = 29.3001 kWh. https://dothemath.ucsd.edu/useful-energy-relations/

[6] The resulting increase in electricity consumption estimates a three times increase in efficiency due to the improved efficiency of electric heat pumps and other electrical equipment of natural gas. Dennis, Keith. 2015. Environmentally Beneficial Electrification: Electricity as the End-Use Option. The Electricity Journal. 28(9). pp. 100-112. https://doi.org/10.1016/j.tej.2015.09.019

[7] Due to RPS, retail electricity emission factors (i.e., IID and SCE), will reduce over time. As described in *Section 2.1, Assumptions*, annual electricity emission factors for IID and SCE are interpolated based on the 2018 emission factor and percent of renewable sources and the 2030 emission factor that would result with the required 60% renewable sources. The presented emission factor is the weighted average retail electricity emission factors based on the average contribution of overall electricity by IID and SCE to CVWD electricity consumption with implementation of Measure E-1 where SCE and IID accounts would be switched to 50% Green Rate by 2022.

[8] Between 2016 and 2019, IID provided on average 45% of CVWD's overall electricity while SCE provided on average 55% of the overall electricity.

[9] GHG Emission Reductions are calculated by subtracting the Additional GHG Emissions from Increased Electricity Consumption from the Natural Gas GHG Emissions Avoided.

Results

The actions associated with Measure DC1 would result in a potential reduction of approximately 55 MT CO_2e by 2030, and approximately 122 MT CO_2e by 2045 as shown in Table 5.

Table 5 GHG Emissions Reduction Associated with Measure DC1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045

DC1-1 Conduct a survey of natural gas and propane consuming devices in offices, control buildings, and other CVWD structures. By 2025 establish a schedule to replace non-emergency use fossil-fuel-consuming equipment with electric-powered equivalents based on operational lifespan estimates.	Supportive	
DC1-2 Explore rebate, grant, or partnership opportunities to fund the replacement of fossil-fuel consuming equipment like HVAC and hot water heaters with electric powered equivalents like heat pumps.	Supportive	
DC1-3 Based on feasibility and the replacement schedule, replace 50% of non-emergency fossil-fuel-consuming equipment with electrically powered equivalents in existing office and CVWD buildings by 2030. Additionally, with obtainment of funding establish goal to replace 75% of equipment by 2045.	55	122
Total Emissions Reduction Potential	**55**	**122**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

Measure FL1: Replace vehicle fleet with zero-emission vehicles as technology allows in alignment with the Advanced Clean Fleet Rule, such that by 2030, 40% of vehicle fleet are zero emissions vehicles and by 2045, 100% of the vehicle fleet are zero emission.

A significant focus of California's climate policy is the decarbonization of the transportation sector through implementation of ZEV technology where feasible and the use of cleaner fuels for combustion everywhere else. In support of this effort, CARB has developed a suite of regulations establishing requirements for vehicle manufacturers, fuel producers and suppliers, transit agencies, fleets, off-road equipment manufacturers, and other transportation emission generators (such as locomotives, ocean-going vessels, harbor craft etc.). Additionally, significant funding has been approved for building out the zero-emissions infrastructure necessary to support the transition to a zero-emission/cleaner fuel market. CVWD's fleet emits on average 3,600 MT of CO_2e per year (5 percent of CVWD's total GHG emissions). As a special district, CVWD will be required to comply with the requirements of the Advanced Clean Fleet Rule once adopted and implementation beginning in 2023, including meeting the ZEV targets as a percent of the total fleet in alignment with the ZEV Target Phase-In Schedule. As part of the compliance obligation, CVWD will be required to report on the fleet annually and when a new vehicle is added to the fleet either as a replacement or addition.

Fully electrifying or otherwise decarbonizing CVWD's fleet and powering it with carbon-free electricity or other zero emission technology would allow for this emission source to achieve carbon neutrality, thereby complying with California's Advanced Clean Fleet requirements and aligning with the State's overall climate policy goals for the transportation sector. Electric passenger vehicles are quickly reaching cost parity with internal combustion vehicles and can even provide cost savings over the lifetime of the vehicle.[14, 15] While there are already commercially available ZEV passenger cars and trucks, the recent EO N-79-20[16] and supporting regulations such as the Clean Miles

[14] Raustad, R. *Electric Vehicle Life Cycle Cost Analysis,* Electric Vehicle Transportation Center. https://rosap.ntl.bts.gov
[15] http://energy.mit.edu/news/study-low-emissions-vehicles-less-expensive-overall/
[16] Executive Order (EO) N-75-20 mandates that 100% of in-state sales of new passenger vehicles are zero-emission by 2035, 100 percent of medium and heavy duty vehicles in the State are ZEV by 2045 for all operations where feasible, and a transition to 100 percent ZE off-road vehicles and equipment in the State be made by 2035 where feasible.

Standard, Advanced Clean Cars II Program, and Advanced Clean Fleets Rule, have accelerated ZEV technology for medium-duty, heavy-duty, and off-road equipment. Further, to support early adoption and promote infrastructure development, there are incentives available for vehicle replacement as well as credits available for charging or hydrogen station owners under the LCFS regulation that can offset the cost of fuel and ZEV vehicle replacements. Currently the most promising ZEV are electric vehicles (EV); however, CVWD will continue to consider new technologies as they become available and may shift to alternative ZEV in the future.

The conversion to an ZEV fleet requires not just replacement of current fleet vehicles with EV or ZEV options, but also the development of supporting infrastructure. The measures making up Measure FL1 provide a roadmap for CVWD to develop a fleet replacement program and infrastructure development to support the ZEV fleet.

Methodology and Assumptions

ACTION FL1-1: AS PART OF VEHICLE FLEET REPLACEMENT PROCESS, INCORPORATE A RETURN ON INVESTMENT ANALYSIS IN THE CRITERIA TO EVALUATE ZEV/EV OPTIONS. (SUPPORTIVE)

Action FL1-1, incorporating a return on investment analysis to evaluate vehicle replacement with ZEV/EV options, provides the first step necessary to effectively plan and follow-through with fleet conversion to ZEV/EVs. When evaluating fleet vehicles for replacement, CVWD currently reviews lifetime cost, vehicle miles, utilization, and compliance requirements. Including a return on investment analysis in the current vehicle replacement assessment will help CVWD to establish a realistic and feasible vehicle replacement schedule that capitalizes on available ZEV/EV technology and is cost effective. The return on investment analysis conducted under Action FL1-1 will also evaluate the infrastructure needed to accommodate a ZEV/EV fleet and identify whether charging or fueling stations would need to be installed and where to meet operational needs and provide the greatest return on investment.

ACTION FL1-2: ADOPT AN ZEV/EV FIRST POLICY FOR FLEET VEHICLES SO THAT ZEV/EVS ARE PURCHASED WHEN REPLACEMENTS ARE NEEDED UNLESS TECHNOLOGICAL, OPERATIONAL, OR COST EFFECTIVENESS ISSUES ARE IDENTIFIED IN ALIGNMENT WITH THE ADVANCED CLEAN FLEET RULE AND EXECUTIVE ORDER B-48-18 AND SB 350 TRANSPORTATION ELECTRIFICATION GOALS. REVISE POLICY REQUIREMENTS WHEN THE ADVANCED CLEAN FLEET REGULATION IS FORMALLY ADOPTED AND IMPLEMENTATION OF RULE BEGINS IN 2023. (SUPPORTIVE)

Action FL1-2, adopt an ZEV/EV first policy for fleet vehicles, provides the policy change enforcing the implementation of fleet conversion which will be required with the adoption of the Advanced Clean Fleet Rule which supports SB 350 and EO B-48-18 transportation electrification goals.[17] Although specific requirements of fleets subject to the Advanced Clean Fleet Rule are not yet finalized, the final rulemaking is anticipated to be completed and the regulation adopted in December 2021 with implementation beginning in 2023. Under the rule public fleets, including special districts, 50% of 2024-2026 model year vehicles added to the fleet must be ZEVs and 100% of 2027 and newer model years must be ZEVs. Compliance reporting would be required annually and within 30 days of adding vehicles to the fleet. The purpose of the policy is to prioritize the purchase of ZEVs/EVs at the time

[17] SB 350 directed State agencies to identify how to increase the transition to zero-emission transportation options and infrastructure. EO B-48-18 directs state entities to work with private sector and all appropriate levels of government to put at least 5 million ZEVs on California roads by 2030 and to spur the construction/installation of 200 hydrogen fueling stations and 250,000 ZEV charging stations by 2025.

of replacement of existing vehicles, as feasible. This action would also support infrastructure development to accommodate ZEV/EV fleet vehicles.

ACTION FL1-3: PURSUANT TO THE ADVANCED CLEAN TRUCKS REGULATION ADOPTED JUNE 2020, COMPLY WITH THE LARGE ENTITY ON-TIME REPORTING REQUIREMENT. (SUPPORTIVE)

The Advanced Clean Trucks Program, approved in June of 2020, established a manufacturers ZEV sales requirement and had a one-time reporting requirement for large entities and fleets. Large entities that operate or dispatch vehicles with a gross vehicle weight rating (GVWR) greater than 8500 lbs and meet the regulation's criteria were required to report applicable fleet information by April 1, 2021. This one-time reporting requirement is being used by CARB for the rulemaking of the Advanced Clean Fleet Rule. CVWD submitted the one-time reporting requirement for its fleet in compliance with the Advanced Clean Trucks regulation. This measure is identified as supportive of the overall FL1 Measure to convert CVWD's fleet to ZEVs.

ACTION FL1-4: CONVERT 40% OF THE CVWD FLEET TO VEHICLES AND EQUIPMENT TO BE POWERED BY ELECTRICITY, FUEL CELLS, AND/OR OTHER ZE TECHNOLOGIES BY 2030 AND AIM TO CONVERT 100% OF CVWD FLEET TO ZEV BY 2045 IN ALIGNMENT THE ADVANCED CLEAN FLEETS RULE (RULE RECOMMENDATION TO BOARD DECEMBER 2021; IMPLEMENTATION BEGINS 2023).

GHG emissions reduction potential for this strategy are dependent on the active transition of internal combustion vehicles in the fleet to a zero-emissions vehicle. On average, approximately 5 percent of CVWD's fleet vehicles are replaced annually.[18] Therefore, for the purposes of this calculation, it is assumed that through the implementation of this action, CVWD will aim to replace 40 percent of the fleet by 2030 and 100 percent by 2045 with a ZEV alternative.

As discussed in the following Measure FL-2, CVWD is committed to using renewable diesel instead of traditional diesel for all diesel fueled equipment and vehicles. As such, to avoid double counting potential GHG emissions reduction achieved in CVWD's fleet with FL-2 GHG emissions related to diesel use in CVWD's fleet have been excluded from fuel use included in the calculation for Action FL1-4.

Fleet fuel consumption reduced in the target year (i.e., 2030 and 2045) was calculated as the forecasted fleet fuel consumption excluding diesel in gasoline gallons equivalents (GGE) multiplied by the percent fleet replacement goal.[19] For this calculation, it was assumed the replacement of fleet vehicles would occur in a linear trend starting in 2022 to the target year (i.e., 2030 and 2045) with the goal of 40 percent of the fleet replaced with ZEVs by 2030 and 100 percent by 2045. It was assumed that the percent of fleet vehicle replacement directly corresponds with the percent reduction in fleet fuel use. As such, with 40% fleet and fleet fuel replacement by 2030 and 100% replacement by 2045, fuel consumption is reduced by 163,260 GGE excluding diesel in 2030, and 463,111 GGE in 2045. Annual avoided emissions were calculated by multiplying the annually reduced fuel consumption in GGE by the fleet emission factor excluding diesel. The fleet emission factor was calculated as the annual forecasted fleet emissions divided by the forecasted annual fleet fuel consumption in the target year, excluding diesel. Forecasted fleet emissions were calculated based on the EPA emission factors for mobile combustion of fuel.[20] Any replacement of vehicles

[18] Annual vehicle fleet replacement is approximately 5% based on spend, i.e. the dollar value of the fleet.
[19] Fuel consumption in vehicle fleet (including equipment) converted to gasoline gallon equivalents (GGE) using the following conversion factors: 1 gallon diesel = 1.155 GGE; 1 gallon propane (LPG) = 0.758 GGE; 1 gallon CNG @3600 (industry standard) = 0.287 GGE; 1 GGE = 1 kwh/0.031 (https://epact.energy.gov/fuel-conversion-factors)
[20] Emission Factors for Greenhouse Gas Inventories (EPA, 2020) (https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf)

with EVs would also generate emissions; however, these emissions would be minimized assuming full implementation of Measure E-1, specifically the switch of retail accounts to the 50% Green Rate option for retail electricity sources by 2022. Because electric vehicles are the most common ZEV option currently on the market, it was assumed for the purposes of this calculation that internal combustion vehicles will be replaced with an EV. With the increase of other ZEV options, such as hydrogen fueled vehicles, entering the marketplace it is likely that CVWD will in the future opt to incorporate other ZEV options along with EVs which has the potential to further reduce emissions. Therefore, it was conservatively assumed that fleet vehicles (excluding diesel fueled) would be replaced by an electric option and that Measure E-1 would be implemented by 2022 further reducing electricity emissions post-2022. The electricity consumption would generate GHG emissions that would offset some of the reduction mobile combustion emissions from fleet vehicles. The calculations and assumptions used to estimate emission reductions from Action FL1-4 are provided in Table 6.

Table 6 Action FL1-4 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Fleet Replacement Goal[1]	40%	100%
Forecasted Fleet Fuel Consumption excluding Diesel (GGE)[2,3]	408,150	463,111
Reduction in Fleet Fuel Consumption (GGE)[3,4]	163,260	463,111
Fleet Emission Factor (MT CO_2e/GGE)[5]	0.00881	0.00881
Fleet GHG Emissions Avoided (MT CO_2e)	1,438	4,080
Increase in Electricity Consumption (MWh)[6]	5,266	14,939
Weighted Electricity Emission Factor Assuming Implementation of Measure E-1 (MT CO_2e/MWh)[7,8]	0.129	0.0
Additional GHG Emissions from Increased Electricity Consumption (MT CO_2e)	677	0.0
Avoided GHG Emissions (MT CO_2e)[9]	**761**	**4,080**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; MMBtu = one million British thermal units; kWh =kilowatt-hour; RPS = Renewable Portfolio Standard

Values have been rounded and may not add up exactly.

[1] It was assumed that the replacement of fleet vehicles would occur in a linear trend starting in 2022 to the target year (i.e., 2030 and 2045) where 40% of fleet vehicles would be replaced by 2030 and 100% by 2045.

[2] Annual fleet fuel consumption is forecasted through future years based on CVWD data reported for the 2016 - 2019 inventory, provided in Appendix A. To avoid double counting with emission reduction potential achieved with the implementation of Measure FL2, diesel fuel consumption by the fleet is excluded in this calculation.

[3] Fuel consumption in vehicle fleet (including equipment) converted to gasoline gallon equivalents (GGE) using the following conversion factors: 1 gallon diesel = 1.155 GGE; 1 gallon propane (LPG) = 0.758 GGE; 1 gallon CNG @3600 (industry standard) = 0.287 GGE; 1 GGE = 1 kwh/0.031 (https://epact.energy.gov/fuel-conversion-factors)

[4] The reduction in fleet fuel consumption is calculated as the fleet replacement goal multiplied by the forecasted fleet fuel consumption, excluding diesel, in the target years (i.e., 2030 and 2045).

[5] A fleet emission factor (MT CO_2e/GGE) was developed based on the forecasted fleet emissions excluding diesel, divided by the forecasted fleet fuel consumption in GGE excluding diesel. The mobile combustion emission factors by fuel type were obtained from U.S. EPA Emission Factors for Greenhouse Gas Inventories (Table 1. https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf). Because the distribution of fuel type use in the fleet is assumed to stay consistent over time without measure implementation, the fleet emission factor without diesel is 0.0081 MT CO_2e/GGE.

[6] The reduction in fleet fuel consumption was converted to electricity consumption using the conversions: 1 GGE = 1 kwh/0.031 (https://epact.energy.gov/fuel-conversion-factors)

[7] Due to RPS, retail electricity emission factors (i.e., IID and SCE), will reduce over time. As described in *Section 2.1, Assumptions*, annual electricity emission factors for IID and SCE are interpolated based on the 2018 emission factor and percent of renewable sources and the 2030 emission factor that would result with the required 60% renewable sources. The presented emission factor is the weighted

average retail electricity emission factors based on the average contribution of overall electricity by IID and SCE to CVWD electricity consumption with implementation of Measure E-1 where SCE and IID accounts would be switched to 50% Green Rate by 2022.

[8] Between 2016 and 2019, IID provided on average 45% of CVWD's overall electricity while SCE provided on average 55% of the overall electricity.

[9] GHG Emission Reductions are calculated by subtracting the Additional GHG Emissions from Increased Electricity Consumption from the Fleet GHG Emissions Avoided. Fleet conversion to other ZEVs other than EVs may result in a further avoided GHG emissions.

ACTION FL1-5: INVESTIGATE GRANT OPPORTUNITIES; LOCAL, STATE, AND FEDERAL INCENTIVES; AND/OR PARTNERSHIPS TO PURCHASE NEW EVS AND INSTALL EV CHARGING AND/OR ZEV INFRASTRUCTURE AT FACILITIES FOR FLEET AND PUBLIC USE. CONDUCT A RETURN ON INVESTMENT ANALYSIS THAT ASSESS COST SAVINGS FROM INCENTIVES FOR EARLY REPLACEMENT OF FLEET VEHICLES WITH ZEV/EV VERSUS THE TRADITIONAL REPLACEMENT SCHEDULE. (SUPPORTIVE)

Action FL1-5, installation of EV charging and/or ZEV infrastructure at facilities, will be necessary to support the conversion of CVWD's fleet to ZEVs under the Advanced Clean Fleets Rule. Several state directives have been signed to accelerate and incentivize the installation of ZEV charging and refueling stations to increase the transition to zero-emission transportation options. In support of SB 350, California Air Resources Board (CARB), the Energy Commission, and California Public Utilities Commission (CPUC) is supporting transportation electrification through directing electrical utilities to invest in EV infrastructure. EO B-48-18 directs state entities to work with private sector and government to increase the installation of hydrogen fueling stations and electric charging stations. Additionally, the LCFS regulation incentivizes the development of ZEV infrastructure through the availability of credits for fuel supply equipment owners and fleets. For early adopters there are currently a number of incentives, credits or opportunities for partnering with ZEV companies who will install and maintain ZEV fueling/charging stations that may offset the cost of ZEV infrastructure installation and increase the return on investment. In addition, programs such as those established by AB 118[21] and credit opportunities through LCFS, provide opportunities for early hydrogen infrastructure development that may not exist once there are enough stations and the Advanced Clean Fleet Rule requires a 100 percent ZEV fleet.

However, because the timeline for fleet conversion is dependent on the Advanced Clean Fleet Rule and the strategy for fleet conversion supporting infrastructure wont be identified until after a return of investment analysis, the GHG emission reduction potential from Measure FL1-5 are not yet known and therefore, have not been quantified as part of this CAAP. This measure is identified as supportive.

Results

The actions associated with Measure FL1 would result in a potential reduction of approximately 761 MT CO_2e by 2030, and approximately 4,080 MT CO_2e by 2045 as shown in Table 7. Replacement of fleet vehicles with ZEV options rather than EVs may result in additional reductions based on the technology selected.

[21] Assembly Bill 118 established the Clean Transportation Program that annually invests up to $100 million for the development and deployment of advanced transportation and fuel technologies including hydrogen refueling infrastructure and electric vehicle charging. The program was extended through January 1, 2024. (https://www.energy.ca.gov/programs-and-topics/programs/clean-transportation-program)

Table 7 GHG Emissions Reduction Associated with Measure FL1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
FL1-1 As part of vehicle fleet replacement process, incorporate a return on investment analysis in the criteria to evaluate ZEV/EV options.	Supportive	
FL1-2 Adopt an ZEV/EV First Policy for fleet vehicles so that ZEV/EVs are purchased when replacements are needed unless technological, operational, or cost effectiveness issues are identified in alignment with Executive Order B-48-18 and SB 350 transportation electrification goals. Revise policy requirements when the Advanced Clean Fleet regulation is formally adopted and implementation of Rule begins in 2023.	Supportive	
FL1-3 Pursuant to the Advanced Clean Trucks regulation adopted June 2020, comply with the Large Entity On-Time Reporting Requirement.	Supportive	
FL1-4 Convert 40% of the CVWD fleet to vehicles and equipment to be powered by electricity, fuel cells, and/or other ZE technologies by 2030 and aim to convert 100% of CVWD fleet to ZEV by 2045 in alignment the Advanced Clean Fleets Rule (Rule recommendation to Board December 2021; implementation begins 2023).	761	4,080
FL1-5 Investigate grant opportunities; local, State, and federal incentives; and/or partnerships to purchase new EVs and install EV charging and/or ZEV infrastructure at facilities for fleet and public use. Conduct a return on investment analysis that assess cost savings from incentives for early replacement of fleet vehicles with ZEV/EV versus the traditional replacement schedule.	Supportive	
Total Emissions Reduction Potential	**761**	**4,080**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

Measure FL2: Use alternative fuels to bridge the technology gap to zero emission vehicles and off-road equipment by achieving 100% replacement of #2 diesel with 100% renewable diesel by 2030

CVWD currently uses a combination of gasoline, diesel, and compressed natural gas to fuel its fleet. Under the Advanced Clean Fleet regulation, CVWD will be required to ultimately convert the fleet to ZEVs. While zero-emission heavy-duty vehicles are being developed, using low-carbon intensity fuels like renewable diesel in its older vehicles and equipment would not require equipment alterations and can help reduce GHG emissions over the short-term. The LCFS regulation is driving the market to increase the availability and decrease the cost of alternative fuels that may offer a return on investment benefit to switch to alternative fuels now in equipment and fleet vehicles that do not need technology changes. The use of alternative fuels allows for additional time to fully vet and/or pilot the new zero-emission technology before infrastructure investments are made, which could help improve the return on investment.

Methodology and Assumptions

ACTION FL2-1: PREPARE AN ASSESSMENT THAT DETERMINES THE QUANTITY OF RENEWABLE DIESEL NEEDED, ANY COSTS INCURRED FROM THE TRANSITION, AND IDENTIFIES A RELIABLE SOURCE OF RENEWABLE DIESEL. (SUPPORTIVE)

CVWD operates a variety of stationary and mobile equipment currently powered by diesel fuel. Replacing the existing diesel fuel with renewable diesel as a short-term measure would reduce emissions with no change in existing infrastructure.[22] Currently, large scale renewable diesel is utilized by the United States military and is also used by a variety of city, state, and private fleets.[23] CVWD has already conducted a feasibility and cost analysis, identifying a source for lower carbon fuels such as renewable diesel that can be utilized in existing vehicles and equipment with no changes in technology necessary and minimal change in cost. Action FL2-1 will incrementally support Measure FL2 by identifying the amount of renewable diesel needed and the co-benefits from switching, such as reduced maintenance for vehicles using renewable diesel over traditional diesel. Further, identifying and establishing a contract with a reliable source of renewable diesel will be necessary for the permanent transition of the identified vehicles and equipment to renewable diesel.

ACTION FL2-2: PRESENT FINDINGS FROM THE ASSESSMENT OF TRANSITIONING FROM DIESEL TO RENEWABLE DIESEL (ACTION F2-1) TO INTERNAL STAKEHOLDERS. (SUPPORTIVE)

CVWD vehicles and equipment generally fuel at CVWD-owned fueling depots. By contracting with fuel suppliers to replace diesel with biodiesel/renewable diesel at these facilities, CVWD can reduce GHG emissions and easily track the amount of low carbon fuels being utilized in the fleet. Presenting the findings from the diesel transition assessment conducted in Action FL2-1 can help to generate further support for fuel transition initiatives and further support Measure FL2.

ACTION FL2-3: TRANSITION CURRENT DIESEL TANKS AT CVWD-OWNED FUELING DEPOTS SUCH THAT 50% OF DIESEL-POWERED FLEET VEHICLES AND EQUIPMENT CAN UTILIZE RENEWABLE DIESEL BY 2023 AND 100% BY 2027.

Renewable diesel can be used interchangeably in a traditional diesel-powered engine and typically does not result in any negative operational impacts.[24] Because the carbon dioxide emissions associated with biodiesel/renewable diesel fuels are biogenic, those emissions do not contribute to long-term increases in GHG emissions in the atmosphere.[25] Only the nitrous oxide (N_2O) and methane (CH_4) emissions increase net GHG emissions in the atmosphere, leading to a significantly lower GHG emission factor for those fuels. Furthermore, renewable diesel fuel is operationally similar to regular diesel and is readily available.[26] CVWD has already identified a source for renewable diesel and determined that no modification would be necessary for any of the CVWD fleet vehicles or equipment that currently use diesel.

Direct GHG emissions reduction for Measure FL2 are dependent on the full conversion of CVWD's diesel-fuel use in on-road vehicles and off-road equipment to renewable diesel. With

[22] https://www.government-fleet.com/156621/what-you-need-to-know-about-renewable-diesel
[23] https://www.caranddriver.com/research/a31883731/biodiesel-vs-diesel/
[24] https://www.government-fleet.com/156621/what-you-need-to-know-about-renewable-diesel
[25] https://climatechange.ucdavis.edu/climate-change-definitions/biogenic-carbon/
[26] https://www.government-fleet.com/156621/what-you-need-to-know-about-renewable-diesel

implementation of this action, CVWD commits to convert its diesel fleet to 50% renewable diesel by 2025 and 100% by 2027.

The identified source of 100% renewable diesel that CVWD plans to use is considered a drop-in replacement to diesel and therefore, is assumed to have the same energy content as fossil derived diesel.[27] As such, a one to one replacement in gallons of diesel with renewable diesel was utilized in this calculation. GHG emissions reduction potential is calculated as the emissions generated from combustion of the forecasted diesel consumption in fleet vehicles at the target year (i.e., 2030 and 2045) less the emissions generated from the combustion of the same amount of renewable diesel combusted. Forecasted activity data is detailed in Appendix A. The EPA GHG emission factor for mobile combustion was used for determining emissions generated from diesel combustion in the fleet.[20] According to the product information of the renewable diesel source, 2.3 tons of CO_2e would be generated per 1,000 gallons of renewable diesel combusted.[28] The calculations and assumptions used to estimate GHG emissions reduction from Action FL2-3 are provided in Table 8.

Table 8 Action FL2-3 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Diesel Replacement Goal	100%	100%
Forecasted Diesel Consumption in Fleet (gallons)[1]	130,725	148,328
Diesel Fuel [mobile] Emission Factor (MT CO_2e/gallon)[2]	0.0102	0.0102
Avoided Emissions from Diesel-fueled Fleet (MT CO_2e)	1,339	1,519
Renewable Diesel Emission Factor (MT CO_2e/gallon)[3]	0.00209	0.00209
Renewable Diesel Fuel GHG Emissions (MT CO_2e)	273	309
Avoided GHG Emissions (MT CO_2e)[4]	**1,066**	**1,210**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; mpg = miles per gallon; VMT = vehicle miles travelled

Values have been rounded and may not add up exactly.

[1] Diesel consumption in the fleet was forecasted based on CVWD projections for growth in service population and associated service. See Appendix A for details.

[2] Emission factors obtained from United States Environmental Protection Agency Emission Factors for Greenhouse Gas Inventories, Table 1 https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf

[3] Emission factor obtained from Nest My Renewable Diesel, the identified source of renewable diesel. The emission factor of 2.3 tons of CO2e/1,000 gallons was converted to metric tons. https://www.neste.us/neste-my-renewable-diesel/product-information/greenhouse-gas-calculator

[4] GHG emissions reduction are calculated by subtracting the GHG Emissions from Renewable Diesel consumption from the Avoided Emissions from Diesel consumption.

ACTION FL2-4: PARTNER WITH HEAVY-DUTY EV COMPANIES TO CONDUCT PILOT STUDIES AND FACILITATE ADVANCEMENTS IN TECHNOLOGY FOR VEHICLE CLASSES WHICH DO NOT CURRENTLY HAVE VIABLE OPTIONS. INVESTIGATE GRANT OPPORTUNITIES FOR SUCH PROJECTS AND PARTNERSHIPS. (SUPPORTIVE)

A portion of CVWD's fleet consists of heavy-duty vehicles that do not currently have a viable and cost effective ZEV option to use as a replacement. Partnering with heavy-duty ZEV companies to conduct a pilot study of new heavy-duty ZEV vehicles through Measure FL2-4 will incrementally support Measure FL2 by serving as a bridge until technology for heavy-duty on-road equipment has advanced to offer ZEV options that are feasible to use for CVWD operations. Further it offers an

[27] https://www.neste.us/neste-my-renewable-diesel/product-information
[28] https://www.neste.us/neste-my-renewable-diesel/product-information/greenhouse-gas-calculator

opportunity to fully vet and/or pilot the new zero-emission technology before infrastructure investments are made, which could help improve the return on investment.

ACTION FL2-5: ENSURE ANY ON-ROAD DIESEL-FUELED MEDIUM HEAVY-DUTY AND HEAVY HEAVY-DUTY ENGINES IN CVWD'S VEHICLES FLEET ARE IN COMPLIANCE WITH THE FLEET RULE FOR PUBLIC AGENCIES AND UTILITIES FLEET. (SUPPORTIVE)

Although renewable diesel is considered to be a "cleaner" fuel that produces less air pollutants than the combustion of fossil derived diesel; CVWD is subject to the Fleet Rule for Public Agencies and will be required to remain compliant with the rule regardless of the fuel used in the fleet. This action incrementally supports Measure FL2 by ensuring compliance of the fleet with the Fleet Rule.

Results

As shown in Table 8, the 100 percent conversion to renewable diesel in CVWD's diesel fleet vehicles would result in a reduction of GHG emissions annually. As such, Measure FL2 would result in a reduction of approximately 1,066 MT CO_2e in 2030, and approximately 1,210 MT CO_2e in 2045 due to implementation of Action FL2-4. Table 9 summarizes the actions associated with Measure FL2 and overall GHG emissions reduction.

Table 9 GHG Emissions Reduction Associated with Measure FL2

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
FL2-1 Prepare an assessment that determines the quantity of renewable diesel needed, any costs incurred from the transition, and identifies a reliable source of renewable diesel.	Supportive	
FL2-2 Present findings from the assessment of transitioning from diesel to renewable diesel (Action F2-1) to Internal Stakeholders on the assessment of transitioning from diesel to renewable diesel.	Supportive	
FL2-3 Transition current diesel tanks at CVWD-owned fueling depots such that 50% of diesel-powered fleet vehicles and equipment can utilize renewable diesel by 2023 and 100% by 2027.	1,066	1,210
FL2-4 Partner with heavy-duty EV companies to conduct pilot studies and facilitate advancements in technology for vehicle classes which do not currently have viable options. Investigate grant opportunities for such projects and partnerships.	Supportive	
FL2-5 Ensure any on-road diesel-fueled medium heavy-duty and heavy heavy-duty engines in CVWD's vehicles fleet are in compliance with the Fleet Rule for Public Agencies and Utilities Fleet.	Supportive	
Total Emissions Reduction Potential	**1,066**	**1,210**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

Measure FL3: Reduce vehicle miles travelled and fuel use for non-ZEV/EV fleet vehicles

The GHG reduction potential that will be achieved due to the use of alternative fuels such as renewable diesel over biodiesel, and the overall transition to a ZEV fleet, as mandated by the Advanced Clean Fleet Rule, can be further maximized by prioritizing use of ZEVs for longer distance travel. Reducing VMT and fuel use of non-ZEV fleet vehicles would limit GHG emissions from mobile combustion of traditional fossil fuel. The use of advanced GPS systems in fleet vehicles that data

such as mileage, vehicle performance, and idling time can allow for vehicle activities and dispatch to be adjusted real-time thereby increasing vehicle efficiency and reducing GHG emissions. Additionally, preventative maintenance of fleet vehicles optimizes vehicles operating conditions thereby reducing emissions.

Methodology and Assumptions

ACTION FL3-1: UPGRADE CURRENT GPS SYSTEMS IN VEHICLE FLEET TO IMPROVE MILEAGE TRACKING, TRACK IDLE TIME, AND TRACK PERFORMANCE. ADJUST VEHICLE DISPATCH PLANNING AND REDUCE IDLE TIME AS NECESSARY TO REDUCE VMT AND IMPROVE VEHICLE OPERATING CONDITIONS.

CVWD's fleet vehicles are currently equipped with an older GPS system that gathers data approximately every 2 minutes. However, CVWD is currently in the planning stages to upgrade the GPS system for all fleet vehicles to a more technologically advanced GPS system that gathers data continuously allowing for real-time adjustments to be made to reduce idle time, improve fuel economy and plan more efficient routes. As CVWD is already planning to replace the current GPS system with a new system, it was assumed for the purposes of this calculation that with implementation of this action that all fleet vehicles would have the new GPS system installed by 2023.

As discussed in Measure FL-2, CVWD is committed to using renewable diesel instead of traditional diesel for all diesel fueled equipment and vehicles by 2027. Based on the average annual percent of CVWD's fleet replacement and Measure FL-1, it was further assumed that by 2030 40% of CVWD's fleet would be replaced with ZEVs. As such, to avoid double counting of potential GHG emission reductions achieved in CVWD's fleet with Measure FL-1 and Measure FL-2 implementation, the impact of using telematics for fleet vehicles was only applied to non-ZEV vehicles and it was assumed that diesel use in vehicles was replaced with renewable diesel on the time schedule established in Measure FL-2.

Studies have found that fleet vehicle fuel efficiency can be improved by approximately 9% with the use of telematics, such as GPS systems. [29] This is attributed to real time tracking allowing for fleet managers to identify areas of improvement such as reduction in idle time, improve equipment utilization, optimizing driving speeds and routes. Emission reductions accounted for this increase in efficiency by assuming a 9.3% reduction in fuel consumption in non-ZEV fleet vehicles. Fleet fuel consumption was then multiplied by the fleet fuel emission factor which accounts for the use of renewable diesel in replacement of traditional diesel. The calculations and assumptions used to estimate emission reductions from Action FL3-1 are provided in Table 10.

Table 10 Action FL3-1 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted Fuel Consumption in Fleet after Measure FL-1 Implementation (GGE)[1,2]	335,482	0
Reduction in Fleet Fuel Consumption (GGE)[3]	31,200	0
Fleet Emission Factor after Measure FL-1 and Measure FL-2 Implementation (MT CO_2e/GGE)[4]	0.0096	0.00
Avoided GHG Emissions (MT CO_2e)[5]	**300**	**0.0**

[29] https://www.greenfleetmagazine.com/155607/efficiency-sustainability-gained-through-telematics

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; VMT = vehicle miles travelled; GGE= gasoline gallons equivalents

Values have been rounded and may not add up exactly.

[1] Fuel consumption in the fleet was forecasted based on CVWD projections for growth in service population and associated service. See Appendix A for details. Fuel consumption was adjusted to account for Measure FL-1 implementation assuming fleet would be 40% ZEV by 2030 and 100% ZEV by 2045.

[2] Fuel consumption in vehicle fleet (including equipment) converted to gasoline gallon equivalents (GGE) using the following conversion factors: 1 gallon diesel = 1.155 GGE; 1 gallon propane (LPG) = 0.758 GGE; 1 gallon CNG @3600 (industry standard) = 0.287 GGE; 1 GGE = 1 kwh/0.031 (https://epact.energy.gov/fuel-conversion-factors)

[3] Assumed a 9.3% reduction in fuel consumption due to use of telematics in fleet vehicles (https://www.greenfleetmagazine.com/155607/efficiency-sustainability-gained-through-telematics)

[4] A fleet emission factor (MT CO_2e/GGE) was developed based on the forecasted fleet emissions assuming Measure FL-1 implementation of a increasingly ZEV fleet and assuming diesel usage is replaced with renewable diesel with implementation of Measure FL-2, divided by the forecasted fleet fuel consumption in GGE with Measure FL-1 and Measure FL-2 implemented. The mobile combustion emission factors by fuel type were obtained from U.S. EPA Emission Factors for Greenhouse Gas Inventories (Table 1. https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf).

[5] GHG emissions reduction are calculated by multiplying the reduced fuel consumption by the fleet emission factor.

ACTION FL3-2: CONTINUE TO PERFORM PREVENTATIVE MAINTENANCE ON VEHICLE FLEETS TO IMPROVE PERFORMANCE, INCLUDING THE PROCUREMENT OF LOW ROLLING RESISTANCE TIRES, USING THE CORRECT TIRE AIR PRESSURE, AND REGULARLY REPLACING AIR FILTERS WHICH WILL IMPROVE FUEL EFFICIENCY.

CVWD performs preventative maintenance on fleet vehicles to ensure vehicles are operating optimally. This includes actions such as, but not limited to ensuring tires are filled to proper tire pressure, regularly replacing air filters, and procuring low rolling resistance tires. According to a study conducted by the EPA, regularly conducted preventative maintenance improves fuel efficiency of vehicles by 3 to 4%.[30] CVWD's is committed to maintaining their fleet and ensuring that the fleet operates the most efficiently. As such, for the purposes of this calculation it was assumed that preventative maintenance will be conducted on all fleet vehicles and that such preventative maintenance will reduce fuel consumption by approximately 4% due to improved fuel efficiency.

To avoid double counting of emission reductions, improvements in fuel efficiency of only non-ZEV vehicles was assessed based on the implementation schedule of Measure FL-1. Because Action FL3-1 and Action FL3-2 improve fuel efficiency by different means, it was assumed that improvements in fuel efficiency due to Action FL3-2 would be additive to Action FL3-1.[31] Therefore, a 4% improvement in fuel efficiency was applied to fleet fuel consumption after implementation of Action FL-2. Fleet fuel consumption after implementation of Action FL3-1 and FL3-2 was then multiplied by the fleet fuel emission factor which accounts for the use of renewable diesel in replacement of traditional diesel. The calculations and assumptions used to estimate emission reductions from Action FL3-2 are provided in Table 11.

Table 11 Action FL3-2 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted Fuel Consumption in Fleet after Measure FL-1 Implementation and Action FL3-1 (GGE)[1,2]	304,282	0
Reduction in Fleet Fuel Consumption (GGE)[3]	12,171	0
Fleet Emission Factor after Measure FL-1 and Measure FL-2 Implementation (MT CO_2e/GGE)[4]	0.0096	0.00
Avoided GHG Emissions (MT CO_2e)[5]	**117**	**0.0**

[30] https://archive.epa.gov/sectors/web/pdf/construction-sector-report.pdf

[31] Action FL3-1 reduces fuel consumption due to improvements in fleet operations (i.e. idling reduction, reduced milage, improved driving speed, improved vehicle utilization), while Action FL3-2 increases fuel efficiency due to individual vehicle optimization.

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; VMT = vehicle miles travelled; GGE= gasoline gallons equivalents

Values have been rounded and may not add up exactly.

[1] Fuel consumption in the fleet was forecasted based on CVWD projections for growth in service population and associated service. See Appendix A for details. Fuel consumption was adjusted to account for Measure FL-1 implementation assuming fleet would be 40% ZEV by 2030 and 100% ZEV by 2045 and to account for a 9.3% reduction in fuel consumption due to implementation of Action FL3-1.

[2] Fuel consumption in vehicle fleet (including equipment) converted to gasoline gallon equivalents (GGE) using the following conversion factors: 1 gallon diesel = 1.155 GGE; 1 gallon propane (LPG) = 0.758 GGE; 1 gallon CNG @3600 (industry standard) = 0.287 GGE; 1 GGE = 1 kwh/0.031 (https://epact.energy.gov/fuel-conversion-factors)

[3] Assumed a 4% reduction in fuel consumption due to preventative maintenance in fleet vehicles (https://archive.epa.gov/sectors/web/pdf/construction-sector-report.pdf)

[4] A fleet emission factor (MT CO_2e/GGE) was developed based on the forecasted fleet emissions assuming Measure FL-1 implementation of an increasingly ZEV fleet and assuming diesel usage is replaced with renewable diesel with implementation of Measure FL-2, divided by the forecasted fleet fuel consumption in GGE with Measure FL-1 and Measure FL-2 implemented. The mobile combustion emission factors by fuel type were obtained from U.S. EPA Emission Factors for Greenhouse Gas Inventories (Table 1. https://www.epa.gov/sites/production/files/2020-04/documents/ghg-emission-factors-hub.pdf).

[5] GHG emissions reduction are calculated by multiplying the reduced fuel consumption by the fleet emission factor.

Results

As shown in Table 10, the use of advanced telematics in fleet vehicles via implementation of Action FL3-1 could result in a reduction of approximately 300 MT CO_2e in 2030. Table 11 details how preventative maintenance of all fleet vehicles through Action FL3-2 would reduce GHG emissions by an additional 117 MT CO_2e in 2030. As such, Measure FL3 would result in a reduction of approximately 417 MT CO_2e in 2030 with implementation of Measure FL-1, the fleet is anticipated to be 100% ZEV by 2045 and therefore, no emission reductions are assumed in 2045 due to the implementation of Measure FL3. Table 12 summarizes the actions associated with Measure FL3 and overall GHG emissions reduction.

Table 12 GHG Emissions Reduction Associated with Measure FL3

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
FL3-1 Upgrade current GPS systems in vehicle fleet to improve mileage tracking, track idle time, and track performance. Adjust vehicle dispatch planning and reduce idle time as necessary to reduce VMT and improve vehicle operating conditions.	300	0
FL3-2 Continue to perform preventative maintenance on vehicle fleets to improve performance, including the procurement of low rolling resistance tires, using the correct tire air pressure, and regularly replacing air filters which will improve fuel efficiency.	117	0
Total Emissions Reduction Potential	**417**	**0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

Measure WW1: Reduce GHG process emissions associated with wastewater treatment

Wastewater treatment process emissions are CVWD's second largest GHG emissions source due to the release of methane. As other measures are implemented such that the fleet and buildings are decarbonized and electricity becomes more carbon-free, wastewater emissions will become CVWD's predominant emission source and will need to be addressed to align with the states carbon neutrality goals. Because technology for reducing methane emissions from wastewater treatment plants can be expensive and requires advanced planning, this measure is focused on preliminary feasibility analysis and investigating funding opportunities for future implementation. Technology is

advancing and stimulus programs such as LCFS may provide cost-effective opportunities to convert captured methane to biofuel for electricity generation or vehicle fleet use. It is anticipated that wastewater emissions will become a major focus of California for production of RNG and reducing GHG emissions in the future.

Methodology and Assumptions

ACTION WW1-1: INVESTIGATE OPPORTUNITIES ASSOCIATED WITH THE CVWD MASTER PLAN FOR WASTEWATER TREATMENT FACILITIES TO REDUCE EMISSIONS AND/OR CAPTURE METHANE. FOR EXAMPLE, AS PART OF PROPOSED CAPITAL IMPROVEMENT PROGRAM (CIP) PROJECT TO INSTALL TWO NEW ANAEROBIC DIGESTERS, CONDUCT A PILOT STUDY FOR METHANE CAPTURE AND CONVERSION TO BIOFUEL UNDER THE LCFS PROGRAM. (SUPPORTIVE)

As part of the *Sanitation Master Plan 2020 Update*[32], various capital improvement projects (CIP) are intended to improve the wastewater treatment process and efficiency through upgrades to the facility. Action WW1-1 would support the measure by identifying potential GHG emissions reduction opportunities associated with planned or proposed wastewater treatment CIPs. Such strategic planning not only helps implementation of GHG emissions reduction actions, but also may present additional cost-saving or cost-offsetting opportunities. For example, one upgrade project in the Sanitation master Plan involves the installation of new anaerobic digesters. Capturing generated methane from anaerobic digesters can be utilized as a biofuel and has the potential to generate credits for a monetary value through the LCFS program.

ACTION WW1-2: INVESTIGATE POTENTIAL PARTNERSHIPS WITH AGENCIES OR ENTITIES LOOKING TO OBTAIN BIOGAS FOR FUEL PRODUCTION THAT WOULD FUND EQUIPMENT COSTS. (SUPPORTIVE)

Action WW1-2 would support the measure through aiding in the funding mechanism for opportunities to capture and utilize the generated methane from the water reclamation plants. Establishing partnerships with agencies or companies interested in biomethane may help with offsetting cost for the necessary equipment and/or ensure a market for the generated biomethane.

Results

The measures associated with Measure WW1 were not quantified as the actual means to implementation will not be known until after initial investigations are completed and funding is obtained as shown in Table 13. However, implementation of Measure WW1 actions would lay the groundwork for future incorporation of GHG emission reduction projects or technology into wastewater treatment process upgrades and aligns with the *Sanitation Master Plan 2020 Update*.

Table 13 GHG Emissions Reduction Associated with Measure WW1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
WW1-2 Investigate opportunities associated with design features of the CVWD Master Plan for wastewater treatment facilities to reduce emissions and/or capture methane. For example, as part of proposed Capital Improvement Program (CIP) project to install two new anaerobic digesters, conduct a pilot study for methane capture and conversion to biofuel under the LCFS Program.	Supportive	

[32] https://www.cvwd.org/ArchiveCenter/ViewFile/Item/820

WW1-2 Investigate potential partnerships with agencies or entities looking to obtain biogas for fuel production that would fund equipment costs.	Supportive
Total Emissions Reduction Potential	**Supportive**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

2.3 Scope 2: Electricity Consumption

Measure E1: Utilize Low-Carbon and Carbon-free Electricity

About half of CVWD's GHG emissions result from the use of electricity to power its pumps, treatment plants, and facilities.[33] As such, half of CVWD's GHG emissions could be reduced by switching to electricity that is generated from renewable or carbon-free sources. CVWD only acquires electricity from retail sources, where approximately 55 percent of acquired electricity is purchased from Southern California Edison (SCE) and 45 percent from Imperial Irrigation District (IID). With the adoption of SB 100 in 2018, all of California's retail power is required to be carbon-free by 2045. However, opting into a more renewable or "greener" electricity tier through current electricity providers now would be the single most effective GHG emission reduction strategy CVWD could take. Further, switching to low-carbon or carbon-free electricity will make other measures more impactful.

Because electricity consumption is the largest source of CVWD's GHG, Measure E1 involves several different types of actions that support the planning phase of this process, implementation of operation-wide changes in electricity purchases and consumption, as well as execution of specific projects that would reduce GHG emissions associated with electricity usage through installation of onsite renewables. Measures that are supportive to the planning phase of this process are not considered to result in quantifiable GHG emissions reduction, but support the efforts to achieve carbon-free electricity.

Methodology and Assumptions

ACTION E1-1: CONDUCT AN ANNUAL RETURN ON INVESTMENT ANALYSIS OF GREEN ELECTRICITY PACKAGES AVAILABLE FROM CURRENT ELECTRICITY PROVIDERS, SCE AND IID, AS WELL AS FROM JOINING DESERT COMMUNITY ENERGY (DCE). RETURN ON INVESTMENT ANALYSIS SHOULD INCLUDE AN EVALUATION OF ELECTRICITY ACCOUNTS THAT CAN BE SWITCHED, ESTIMATED COST FOR THE SWITCH, AS WELL AS BENEFITS FROM ACHIEVING GREATER GHG EMISSIONS REDUCTION AS IT RELATES TO GRANT FUNDING OPPORTUNITIES ASSOCIATED WITH THE CAAP. EXCEED THE RENEWABLE ELECTRICITY STANDARD SET BY SENATE BILL 100 FOR ELECTRICITY PURCHASES BY OPTING INTO A GREEN RATE PACKAGE WITH SCE AND IID.

CVWD can reduce its retail electricity emissions by purchasing low carbon electricity through green tariff options (lower carbon electricity options provided by the utility or a Community Choice Aggregation, CCA) and potentially reduce the cost of electricity simultaneously. Most retail providers offer a portfolio of green energy options, each with a guaranteed percentage of green energy.[34]

[33] The use of electricity generates emissions when it is generated by non-renewable sources such as natural gas.
[34] Annual renewable electricity composition is based on composition of carbon-free sources for SCE and IID retail power that currently exist and an assumed linear trend to 100% carbon neutral by 2045. SCE and IID offer a 50% and 100% renewables option. In 2019, SCE's

The emissions reduction impact of Action E1-1 results from the increased renewable and carbon-free electricity supplied to CVWD from switching its retail accounts to green tariff options offered by their electricity providers. The calculations and assumptions used to estimate emission reductions from Action E1-1 are provided in Table 14. The avoided emissions are calculated as the difference between emissions generated from current annual retail electricity consumption versus that same electricity purchased using an example green tariff option for electricity. For the purposes of this calculation, it was assumed that CVWD would switch SCE electricity accounts to the 50% Green Rate option and switch IID electricity accounts to the 50% Green Energy Program option. Based on the amount of eligible renewable electricity sources that make up the standard retail electricity versus the green tariff option, by 2030, the emission factor for the SCE 50% Green Rate electricity is anticipated to be approximately 20 percent lower than SCE standard retail electricity and the emission factor for the IID 50% Green Energy electricity is anticipated to be approximately 9 percent lower than IID standard retail electricity. As such, with implementation of Action E1-1 using the 50 percent Green Rate and Green Energy programs a reduction of 4,155 MT CO_2e by 2030 could be achieved. Additional reductions could be achieved by switching to an even lower carbon option like 100% carbon free or 100% renewable options could achieve an even greater reduction of 28,431 MT CO_2e by 2030. Note that this action would provide GHG emissions reduction up to the point that all of California's retail electricity is provided from renewable sources, which is anticipated to occur prior to 2045. As such, no reduction would be achieved in 2045 as retail electricity will be 100 percent carbon-free.

Table 14 Action E1-1 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted Retail Power Purchased (kWh)[1]	188,378,446	215,340,295
Forecasted Retail Power Purchased (MWh)	188,378	215,340
Average Retail GHG Emission Factor (MT CO_2e/MWh)[2,3]	0.151	0.0
GHG Emissions Generated using Retail Electricity (MT CO_2e)[5]	28,431	0.0
Average Green Rate Electricity Emission Factor (MT CO2e/MWh)[3,4]	0.129	0.0
GHG Emissions Generated using 50% Green Retail Electricity (MT CO2e)[5]	24,276	0.0
Avoided GHG Emissions (MT CO_2e)[6]	**4,155**	**0.0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; kWh =-kilowatt-hour; MWh = megawatt-hour; 1,000 kWh = 1 MWh

Values have been rounded and may not add up exactly.

[1] The amount of electricity consumed in 2030 and 2045 was forecasted based on the amount of electricity purchased in 2016 through 2019 and scaled based on the anticipated increase in water delivery in 2030 and 2045 as detailed in the 2020 RUWMP.

[2] Due to RPS, retail electricity emission factors (i.e., IID, SCE), will reduce over time. Per SB 100, retail electricity providers, including both SCE and IID would be required to obtain 60% of electricity from renewable sources. Emission factors in 2030 for SCE and IID were calculated based on the 2019 emission factors and 2019 renewable portfolio for each retail provider where in 2019 IID and SCE obtained 42.5%, and 35.1%, respectively, of electricity from renewable sources. As such, to meet SB 100 requirements IID and SCE would increase their portfolio of renewably sourced electricity by 17.5% and 24.9%, respectively. It was assumed that the 2030 emission factors would decrease to the same degree.

[3] Based on electricity purchases from 2016 through 2019, approximately 55% of all CVWD electricity purchased was from SCE and 45% was from IID. For the purposes of this calculation it was assumed that the contribution by SCE and IID to total electricity purchased would remain constant. The average emission factor is weighted based on the percent of total electricity purchased that came from SCE vs IID.

Green Rate option provided 67.5% or 100% eligible renewable energy compared with the standard SCE retail electricity which was 35.1% eligible renewable energy (https://www.sce.com/sites/default/files/inline-files/SCE_2019PowerContentLabel.pdf). In 2019, IID's Green Energy Program option provided 50% or 100% eligible renewable energy compared with the standard IID retail electricity which was 42.6% eligible renewable energy (https://www.iid.com/energy/renewable-energy/power-content-label).

[4] Renewable electricity composition in 2030 for IID's 50% Green Energy Program and SCE's 50% Green Rate Program is based on composition of carbon-free sources that currently exist in those programs and an assumed linear trend to 100% carbon neutral by 2045. In 2019, SCE's 50% Green Rate option provided 67.5% eligible renewable energy (https://www.sce.com/sites/default/files/inline-files/SCE_2019PowerContentLabel.pdf) and IID's 50% Green Energy Program option provided 50% eligible renewable energy (https://www.iid.com/energy/renewable-energy/power-content-label). As such, by 2030 SCE's 50% Green Rate Program is anticipated to be approximately 80% renewable sources, 20% greater than the required 60%, and IID's 50% Green Energy Program is anticipated to be 69% renewable, 9% greater than the required 60%. For the purposes of this calculation is was assumed that emission factors for SCE and IID would decrease from the calculated 2030 standard package emission factor by approximately 20% and 9%, respectively.

[5] GHG emissions generated using either retail or green tariff power is calculated by multiplying the average emission factor by the amount of retail power that is anticipated to be purchased in 2030 and 2045.

[6] Action E1-1 GHG emissions reduction are calculated as the difference between the emissions generated using the standard retail power package versus emissions generated using the 50% green power packages.

ACTION E1-2: CONTINUE TO ANALYZE TIME-OF-USE EMISSIONS FACTORS AND COSTS TO BETTER MODEL GHG EMISSIONS AND COSTS FOR FUTURE PROJECTS. INCLUDE ANALYSIS AS PART OF ANNUAL CAAP PROGRESS MONITORING. (SUPPORTIVE)

Under Action E1-2, CVWD will continue to investigate the technical and cost-related feasibility of time-of-use measures including the impact to pumps and other infrastructure, the current time-of-use trends, and the cost and GHG reduction implications. This supports the prioritization of operational changes where it may not be feasible to obtain carbon-free electricity and assists in future planning of projects.

ACTION E1-3: WHEN OPERATIONALLY FEASIBLE, SCHEDULE TIMES OF HIGH PUMPING TO COINCIDE WITH TIMES OF HIGH RENEWABLE ENERGY AVAILABILITY AND LOW DEMAND TO REDUCE GHG EMISSIONS AND SMOOTH DEMAND CURVE. ESTABLISH A GOAL TO SHIFT 10% OF PUMPING TIMES TO MID-DAY.

Approximately half of CVWD's Scope 2 GHG emissions are tied to the consumption of electricity needed for pumping water at booster stations and from groundwater wells. Time-of-use strategies, which entail changing the time of day operations are occurring to off-peak hours when there is a higher amount of renewables sourcing the grid can reduce GHG emissions from electricity consumption and potentially reduce cost of electricity simultaneously.

The emissions reduction impact of Action E1-3 results from shifting some amount of pumping operations to a time of day when grid electricity is from more carbon-free sources and demand is lower. Under Action E1-3, CVWD would aim to shift 10 percent of pumping operations to mid-day, i.e. low grid times. Based on annual electricity data between 2016 and 2019, on average approximately 9 percent of total electricity consumed by CVWD is for pumping at booster stations and 39 percent for well pumping. For the purposes of this calculation it was assumed that the percent of total electricity consumption for pumping operations would remain constant over time and was applied to forecasted electricity consumption. Future electricity consumption was forecasted based on anticipated growth in CVWD operations primarily related to increased water delivery. Avoided GHG emissions annually is based on the difference in emission factors between the low grid times, that pumping operations could be shifted too, and average grid times which are representative of current pumping operations that do not use time-of-use strategies. The CAISO electricity emission factor at low grid times was found to be approximately 28 percent lower than the daily average emission factor.[35] The difference in low-grid and average-grid emission factors in MT CO_2e is multiplied by the amount of electricity anticipated for pumping operations. The amount of avoided emissions would be minimized assuming full implementation of Actions E1-1, specifically the switch of retail accounts to the 50% or 100% Green Rate options for retail electricity sources.

[35] Variation in daily electricity emission factors due to incorporation of renewable energy during the day is based on CAISO daily emissions and electricity tracking. (Source: http://www.caiso.com/TodaysOutlook/Pages/emissions.aspx)

Therefore, it was assumed that Actions E1-1 would be implemented further reducing electricity emissions associated with pumping. This results in a reduction of approximately 330 MT CO_2e by 2030 due to implementation of Action E1-3 and incorporation of Action E1-1. Note that between the achievable emissions reduction will incrementally reduce between 2030 and 2045 as provided electricity becomes more carbon-free. Retail electricity is anticipated to be carbon-free some time prior to 2045 due to SB 100 and as such no reduction would be achieved in 2045.. The calculations and assumptions used to estimate emission reductions from Action E1-1 are provided in Table 15.

Table 15 Action E1-3 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted Electricity Consumption (MWh)[1]	188,378	215,340
Percent of Total Electricity for Pumping Operations[2]	48%	48%
Electricity Usage for Pumping Operations (MWh)[2]	90,452	103,398
Target Percent Shift in Pumping Operations with Implementation of Action E1-3	10%	10%
Shifted Pumping Operations Electricity Usage (MWh)[3]	9,045	10,340
Average Electricity Emission Factor Assuming Implementation of Action E1-1 (MT CO_2e/MWh)[4,5]	0.129	0.0
Difference Between Lowest and Average Emission Factor Assuming Implementation of Action E1-1 (MT CO_2e/MWh)[6]	0.092	0.0
Avoided GHG Emissions (MT CO_2e)[7]	**330**	**0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; kWh =-kilowatt-hour, MWh = Megawatt hour

Values have been rounded and may not add up exactly.

[1] The amount of electricity consumed in 2030 and 2045 was forecasted based on the amount of electricity purchased in 2016 through 2019 and scaled based on the anticipated increase in water delivery in 2030 and 2045 as detailed in the 2020 RUWMP. Calculations are detailed in Appendix A.

[2] Electricity usage for pumping operations is based on CVWD historical data for pumping at booster stations and wells obtained from utility data that included electricity consumption by end-use between 2016 and 2019. For the purposes of this calculation, it is assumed that percent of electricity consumed for pumping operations remains constant over time.

[3] The amount of electricity assumed to be shifted under Action E1-3 is determined as the forecasted amount of electricity for pumping operations multiplied by the target percentage to shift under Action E1-3.

[4] Due to RPS, retail electricity emission factors (i.e., IID and SCE), will reduce over time. As described in *Section 2.1, Assumptions*, annual electricity emission factors for IID and SCE are interpolated based on the 2018 emission factor and percent of renewable sources and the 2030 emission factor that would result with the required 60% renewable sources. The presented emission factor is the weighted average retail electricity emission factors based on the average contribution of overall electricity by IID and SCE to CVWD electricity consumption with implementation of Measure E-1 where SCE and IID accounts would be switched to 50% Green Rate by 2022.

[5] Between 2016 and 2019, IID provided on average 45% of CVWD's overall electricity while SCE provided on average 55% of the overall electricity.

[6] The electricity emission factor at low grid times was found to be approximately 28 percent lower than the daily average emission factor due to incorporation of renewable energy during the day. This is based on CAISO daily emissions and electricity tracking (Source: http://www.caiso.com/TodaysOutlook/Pages/emissions.aspx)

[7] Avoided GHG emissions is calculated as the shifted annual electricity consumption from pumping with implementation of Action E1-3 goal multiplied by the difference between the low and average grid emission factors.

ACTION E1-4: COMPLETE THE INSTALLATION OF SOLAR-TOPPED PARKING STRUCTURES AND BATTERY STORAGE SYSTEM TO COVER 100% OF CVWD PALM DESERT CAMPUS ENERGY CONSUMPTION NEEDS BY 2030.

CVWD has undertaken a Capital Improvement Project to install solar-topped parking structures and battery storage system at the CVWD Palm Desert Campus to cover 100% of all of the Campus's energy needs. One average, the Palm Desert Campus consumed approximately 13,142 kWh

annually between 2016 and 2019. Future growth in CVWD operations is primarily related to increased water delivery services and is not anticipated to affect current operations at the Palm Desert Campus. Therefore, for the purposes of this calculation it was assumed that energy consumption at the Desert Palm Campus would remain constant over time.

Avoided GHG emissions annually is based on the difference of emission factors between the retail electricity and 100 percent on-site renewable electricity (i.e. emission factor of 0 MT CO_2e). The Desert Palm Campus electricity is received from SCE. The reduction in emissions from this project would be minimized assuming full implementation of Action E1-1 specifically the switch of SCE retail accounts to the 50% Green Rate account. Therefore, it was assumed that Action E1-1 would be implemented by the completion of this project further reducing electricity emissions. This results in a GHG emission reduction of approximately 1.6 MT CO_2e by 2030 due to implementation of Action E1-4 and incorporation of Action E1-1. Note that no reduction would be achieved in 2045 as retail electricity will be 100 percent carbon-free. The calculations and assumptions used to estimate emission reductions from Action E1-4 are provided in Table 16.

Table 16 Action E1-4 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Annual Energy Consumption at Desert Palm Campus (kWh)[1]	13,142	13,142
Annual Energy Consumption at Desert Palm Campus (MWh)	13.14	13.14
Average SCE Electricity Emission Factor Assuming Implementation of Action E1-1 (MT CO_2e/MWh)[2]	0.120	0.0
Avoided GHG Emissions (MT CO_2e)[3]	**1.6**	**0.0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; MWh = megawatt-hour; kWh =-kilowatt-hour; 1,000 kWh = 1 MWh
Values have been rounded and may not add up exactly.

[1] Average annual electricity usage at Desert Palm Campus based on years 2016 through 2019. Assumed to remain constant over time.

[2] Desert Palm Campus receives electricity from SCE. Renewable electricity composition in 2030 for SCE's 50% Green Rate Program is based on composition of carbon-free sources that currently exist in those programs and an assumed linear trend to 100% carbon neutral by 2045. In 2019, SCE's 50% Green Rate option provided 67.5% eligible renewable energy (https://www.sce.com/sites/default/files/inline-files/SCE_2019PowerContentLabel.pdf). As such, 2030 SCE's 50% Green Rate Program is anticipated to be approximately 80% renewable sources, 20% greater than the SB 100 required 60%. For the purposes of this calculation is was assumed that emission factors for SCE would decrease from the calculated 2030 standard package emission factor by approximately 20%. By 2045, 100 percent of all electricity should be obtained from renewable sources per SB 100 and therefore the emission factors is 0.

[3] Avoided GHG emissions in 2030 is calculated as the annual electricity consumption at Desert Palm Campus multiplied by the SCE 50% Green Rate emission factor calculated as described in note 2.

ACTION E1-5: INVESTIGATE OPPORTUNITIES AND PARTNERSHIPS FOR GENERATING LOW-CARBON INTENSITY (CI) ELECTRICITY FROM WASTEWATER TREATMENT PLANTS TO GENERATE LCFS CREDITS OR POWER FOR WATER RECLAMATION PLANT ELECTRICITY NEEDS ASSOCIATED WITH THE PALM DESERT CAMPUS (I.E., WRP 10). (SUPPORTIVE)

Electricity use at the water reclamation plants (WRPs) currently accounts for approximately 24 percent of total electricity consumed by CVWD operations. Under Action E1-5, CVWD would investigate opportunities to generate or obtain low-CI electricity for the WRP operations. There may be opportunities within the LCFS program to generate LCFS credits or other rebate programs to offset cost of technology to generate on-site low-CI electricity. This supports the prioritization of cost-effect operations while capitalizing on available incentives to reduce GHG emissions from electricity use.

ACTION E1-6: INVESTIGATE OPPORTUNITIES TO REDUCE ENERGY COSTS, IMPROVE RESILIENCE, AND REDUCE ELECTRICITY GHG EMISSIONS THROUGH ADDITIONAL ON-SITE SOLAR AND BATTERY STORAGE TO SUPPORT CVWD OPERATIONAL ENERGY USE AND/OR INVESTIGATE THE COST EFFECTIVENESS TO ENTER A POWER PURCHASE AGREEMENT. (SUPPORTIVE)

The single largest source of GHG emissions associated with CVWD's operations is related to electricity consumption. Action E1-6 supports the goal to obtain carbon-free electricity through various strategies if it is not cost-effective or feasible to switch all retail electricity accounts to the available carbon-free packages. Further, increasing on-site solar and battery storage will also improve the resilience of CVWDs electricity needs.

Results

Table 17 summarizes the actions associated with Measure E1 and potential GHG emissions reduction. Because this electricity consumption is the largest source of emissions for CVWD operations, Measure E1 involves several different types of actions that support the planning phase of this process, including implementation of operation-wide changes in electricity purchases and consumption, as well as execution of specific projects. Action E1-1, E1-3, and E1-4 would result in a reduction of approximately 4,486 MT CO_2e by 2030. Additional reductions could be achieved through implementation of Action E1-1 by switching to an even lower carbon option like 100% carbon free or 100% renewable options, where a reduction of up to 28,431 MT CO_2e could be achieved by 2030. Note that no reduction would be achieved in 2045 as retail electricity will be 100 percent carbon-free.

Table 17 GHG Emissions Reduction Associated with Measure E1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
E1-1 Conduct an annual return on investment analysis of green electricity packages available from current electricity providers, SCE and IID, as well as from joining Desert Community Energy (DCE). Return on investment analysis should include an evaluation of electricity accounts that can be switched, estimated cost for the switch, as well as benefits from achieving greater GHG emissions reduction as it relates to grant funding opportunities associated with the CAAP. Exceed the renewable electricity standard set by Senate Bill 100 for electricity purchases by opting into a green rate package with SCE and IID.[1]	4,155	0.0
E1-2 Continue to analyze time-of-use emissions factors and costs to better model GHG emissions and costs for future projects. Include analysis as part of annual CAAP progress monitoring.	Supportive	
E1-3 When operationally feasible, schedule times of high pumping to coincide with times of high renewable energy availability and low demand to reduce GHG emissions and smooth demand curve. Establish a goal to shift 10% of pumping times to mid-day.	330	0
E1-4 Complete the installation of solar-topped parking structures and battery storage system to cover 100% of CVWD Palm Desert Campus energy consumption needs by 2030.	1.6	0.0

E1-5 Investigate opportunities and partnerships with fuel providers within the LCFS program associated with generating low-carbon intensity (CI) electricity from wastewater treatment plants to generate LCFS credits and power for water reclamation plan electricity needs associated with the Palm Desert Campus (i.e., WRP 10).		Supportive
E1-6 Investigate opportunities to reduce energy costs, improve resilience, and reduce electricity GHG emissions through additional on-site solar and battery storage to support CVWD operational energy use and/or investigate the cost effectiveness to enter a Power Purchase Agreement		Supportive
Total Emissions Reduction Potential[1]	**4,486**	**0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; PPA = Power Purchase Agreement

[1] Potential GHG emission reductions due to implementation of Action E1-1 are based on switching retail accounts to the 50% Green Rate/Green Energy options. Additional reductions can be achieved by switching one or both retail accounts to an even lower carbon option like 100% carbon free.

Measure EE1: Improve Energy Efficiency at CVWD Facilities and Buildings

In addition to Measure E1, reduction of carbon intensity of the electricity used, CVWD can further reduce GHG emissions associated with electricity use by improving energy efficiency and thereby reducing electricity demand for operations. There are several opportunities for increased energy efficiency that can be employed at various points throughout CVWD's operations. The actions making up Measure EE1 include specific energy efficiency actions that can be completed now, such as, upgrading the lighting system or implementing the actions recommended from in-house energy audits, while other measures require further investigation to determine the course of implementation. Continued efforts to reduce electricity consumption by identifying opportunities to improve energy efficiency are supportive to Measure EE1. Actions that are considered quantifiable if implemented now due to adequate data availability, are discussed in detail below. Note that while some of the specific actions discussed below have quantifiable GHG emission reductions, the extent of those reductions is dependent on other Measures implemented. For example, there is a risk of double counting when all Measures in this CAAP are implemented in full, therefore, care has been taken when estimating GHG reductions. The quantified GHG emission reductions detailed below provide an estimate of the potential reductions that could be achieved with implementation of Measure EE1; the actually GHG emission reductions achieved will be dependent on the level of implementation of Measure E1 and the degree of implementation of each of the actions listed below.

Methodology and Assumptions

ACTION EE1-1: AS PART OF THE ASSET MANAGEMENT PROGRAM, IDENTIFY AGING EQUIPMENT DUE FOR REPLACEMENT THROUGHOUT CVWD FACILITIES AND IDENTIFY ENERGY EFFICIENT ALTERNATIVES TO USE FOR THE REPLACEMENT (E.G., ENERGYSTAR CERTIFICATIONS). INCLUDE A RETURN ON AN INVESTMENT ANALYSIS AS PART OF THE REPLACEMENT PROCESS THAT EVALUATES THE CAPITAL INVESTMENT FOR AN ENERGY EFFICIENT ALTERNATIVE PIECE OF EQUIPMENT, COST SAVINGS ASSOCIATED WITH IMPROVED ENERGY EFFICIENCY, AND IDENTIFIES ANY GRANTS OR REBATES ASSOCIATED WITH SUCH EQUIPMENT REPLACEMENT. (SUPPORTIVE)

By identifying eligible assets for updating to energy efficient technology this will help to streamline the process of improving energy efficiency of CVWD facilities and buildings. In order for this action

to be quantifiable the assets need to first be identified; therefore, there this action is considered supportive of Measure EE1.

ACTION EE1-2: CONTINUE TO CONDUCT ENERGY AUDITS ANNUALLY AND IMPLEMENT TOP ENERGY RECOMMENDATIONS. AS PART OF CAAP MONITORING, TRACK ENERGY IMPROVEMENTS DUE TO IMPLEMENTATION OF ENERGY AUDIT RECOMMENDATIONS ANNUALLY. (SUPPORTIVE)

CVWD currently conducts energy audits to improve energy efficiency and optimize operations as well as to identify potential new areas for energy efficiency improvements. Under Action EE1-2, implementation of energy audits and the resulting reduction in energy usage will also be tracked. By tracking the effectiveness of energy efficiency projects or actions once implemented, CVWD can gain a better understanding of what actions are most impactful to reduce CVWD's energy use and associated costs.

ACTION EE1-3: BASED ON THE RECOMMENDATIONS FROM COACHELLA VALLEY WATER DISTRICT WATER RECLAMATION PLANT (WRP) ENERGY OPTIMIZATION EVALUATION, IMPLEMENT THE TOP ENERGY EFFICIENCY MEASURES (EEM) AT WRP 4, WRP 7 AND WRP 10 WITH A BENEFIT-TO-COST RATIO GREATER THAN 1.0 BY 2030. THE IDENTIFIED EEM ARE ALIGNED WITH THE SANITATION MASTER PLAN AND INCLUDE ENERGY OPTIMIZATION SUCH AS AERATION IMPROVEMENTS, TREATMENT OPTIMIZATION, IMPROVED SITE AND BUILDING LIGHTING, AND ADDITION OF SOLAR PANELS TO THE WRPS.

One of CVWD's continuing strategic initiatives is to optimize energy usage at its facilities to promote community sustainability and increase operational optimization. In April of 2021, CVWD conducted a cost-benefit analysis to validate energy efficiency measures for CVWD's water reclamation plants (WRPs) 4, 7 and 10 previously identified as Capital Improvement Projects (CIP) in *the Sanitation Master Plan Update 2020*.[36] Based on the evaluation, energy efficiency measures or projects that had payback periods less than the anticipated useful life of the project were recommended. Implementation of these recommended measures, under Action EE1-3 of this CAAP, would reduce CVWD's GHG emissions from reduced electricity consumption.

As part of the *CVWD WRP Energy Optimization Evaluation* Memorandum prepared by CVWD, annual energy savings at WRP 4, 7 and 10 from implementation of CIP number 4-4, 7-2, and 10-4, respectively, were calculated based on the 2018 operating year. Based on the estimated annual energy savings and total electricity consumed in 2018, implementation of CIP number 4-4, 7-2, and 10-4 would result in an annual energy savings of approximately 8.8% of total electricity consumption. For the purposes of this calculation, it was assumed that an 8.8% energy savings would remain constant over time with implementation of Action EE1-3 and was applied to total forecasted electricity consumption. The amount of avoided emissions would be minimized assuming full implementation of Measure E1, Actions E1-1, specifically the switch of retail accounts to the 50% Green Rate options for retail electricity sources. Therefore, it was assumed that Actions E1-1 would be implemented further reducing electricity emissions associated with lightening. The calculations and assumptions used to estimate emission reductions from Action EE1-3 are provided in Table 18. As shown, implementation of Action EE1-3 has the potential to result in a reduction of approximately 2,132 MT CO_2e by 2030. Note that this action would provide GHG emissions reduction up to the point that all of California's retail electricity is provided from renewable sources, which is anticipated to occur prior to 2045. As such, no reduction would be achieved in 2045 as retail electricity will be 100 percent carbon-free.

[36] https://www.cvwd.org/492/Sanitation-Master-Plan-Update-2020

Table 18 Action EE1-3 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted Electricity Consumption (MWh)[1]	188,378	215,340
Efficiency Improvement (%)[2]	8.8%	8.8%
Reduced Electricity (MWh)[3]	16,575	18,947
Average Electricity Emission Factor Assuming Implementation of Action E1-1 (MT CO_2e/MWh)[4,5]	0.129	0.0
Avoided GHG Emissions (MT CO_2e)[6]	**2,132**	**0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; kWh =-kilowatt-hour; MWh = megawatt-hour

Values have been rounded and may not add up exactly.

[1] The amount of electricity consumed in 2030 and 2045 was forecasted based on the amount of electricity purchased in 2016 through 2019 and scaled based on the anticipated increase in water delivery in 2030 and 2045 as detailed in the 2020 RUWMP.

[2] Based on the calculated annual energy savings with implementation of Sanitation Master Plan CIP number 4-4 for WRP 4, 7-2 for WRP 7, and 10-4 for WRP 10 and annual electricity usage in operating year 2018. (*CVWD WRP Energy Optimization Evaluation*, April 29, 2021)

[3] Reduced electricity is based on 8.8% percent of current electricity usage being reduced by 2030 through 2045 for implementation of Action EE1-3.

[4] Due to RPS, retail electricity emission factors (i.e., IID and SCE), will reduce over time. As described in *Section 2.1, Assumptions*, annual electricity emission factors for IID and SCE are interpolated based on the 2018 emission factor and percent of renewable sources and the 2030 emission factor that would result with the required 60% renewable sources. The presented emission factor is the weighted average retail electricity emission factors based on the average contribution of overall electricity by IID and SCE to CVWD electricity consumption with implementation of Measure E-1 where SCE and IID accounts would be switched to 50% Green Rate by 2022.

[5] Between 2016 and 2019, IID provided on average 45% of CVWD's overall electricity while SCE provided on average 55% of the overall electricity.

[6] Avoided GHG emissions is calculated as the Reduced Electricity multiplied by the weighted electricity emission factor with incorporation of Measure E1, Action E1-1 as described in note 5 and 6.

ACTION EE1-4: DEVELOP A POLICY THAT WOULD REQUIRE ANY NEW CVWD BUILDING TO ACHIEVE A MINIMUM LEVEL OF LEED GOLD CERTIFICATION OR LEED GOLD EQUIVALENT TO IMPROVE ENERGY EFFICIENCY AND REDUCE COST BASED ON HIGH RETURN ON INVESTMENT GREATER THAN 20%. (SUPPORTIVE)

Action EE1-4 incrementally supports Measure EE1, by ensuring that any new buildings or facilities will be energy efficient. Requiring new buildings and facilities to meet LEED standards will reduce the long-term cost of operating the buildings while improving energy efficiency for new structures. Since this is applicable only to new buildings that aren't being constructed yet this action is not quantifiable.

ACTION EE1-5: CONTINUE TO UTILIZE AUTOMATED LIGHTING CONTROLS FOR INDOOR/OUTDOOR LIGHTING FOR CVWD CAMPUSES PURSUANT TO THE CURRENT CEC BUILDING ENERGY EFFICIENCY STANDARDS (TITLE 24, PART 6 AND 11). (SUPPORTIVE)

Action EE1-5 supports energy efficiency in the lighting of CVWD buildings and facilities as automated lighting controls help to reduce the amount of excess energy used and improve the efficiency of use. CVWD currently utilizes automated lighting controls pursuant to existing CEC Building Energy Efficiency standards, therefore quantification of this action would risk double counting of GHG emissions already avoided. However, continuing to implement this action is supportive of Measure EE1 as a whole.

ACTION EE1-6: PURSUANT TO THE CEC 2019 BUILDING ENERGY EFFICIENCY STANDARDS (TITLE 24, PART 6 AND 11), REQUIRE ALL NEW CONSTRUCTION AND BUILDING UPGRADES UTILIZE LIGHT EMITTING

DIODE (LED) LIGHTING TECHNOLOGY ONLY. ESTABLISH GOAL TO CONVERT ALL INTERIOR AND EXTERIOR LIGHTING AT 50% OF CVWD FACILITIES TO LED TECHNOLOGIES BY 2027 AND 100% BY 2035.

Conversion of interior and exterior lighting to more energy efficiency light bulbs throughout CVWD's facilities has the potential to reduce cost and reduce GHG emissions generated from electricity use. According to the United States Department of Energy, ENERGY STAR-qualified LEDs use only 20 to 25 percent of the energy of traditional incandescent bulbs while high-efficiency incandescent bulbs could use between 80 and 30 percent of the energy of the traditional incandescent bulbs they replace.[37] For the purposes of this calculation, it is estimated approximately 10 percent of CVWD's electricity use is due to lighting, that the percent of total electricity use for lighting would remain constant over time, and that lighting improvements are on average 50 percent more efficient than previous lighting.[38]

The emission reduction impact of Action EE1-6 is based on 50 percent of lighting electricity being improved by 50 percent by 2027, and by 100 percent by 2035. Avoided emissions are calculated as the amount of annually reduced electricity from lighting multiplied by the annual retail emission factor. The calculations and assumptions used to estimate emission reductions from Action EE1-6 are provided in Table 19. Emissions reductions are based on CVWD achieving a 50 percent implementation (50% of buildings have been retrofit with LEDs) of Action EE1-6 by 2027 and achieving a 100 percent implementation by 2035. CVWD has already begun this process and therefore, the phase in of this measure was assumed to start in 2022. The amount of avoided emissions would be minimized assuming full implementation of Measure E1, Actions E1-1, specifically the switch of retail accounts to the 50% Green Rate options for retail electricity sources. Therefore, it was assumed that Actions E1-1 would be implemented further reducing electricity emissions associated with lightening. This results in a reduction of approximately 833 MT CO_2e by 2030 due to implementation of Action EE1-6. Note that this action would provide GHG emissions reduction up to the point that all of California's retail electricity is provided from renewable sources, which is anticipated to occur prior to 2045. As such, no reduction would be achieved in 2045 as retail electricity will be 100 percent carbon-free.

Table 19 Action EE1-6 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Forecasted Electricity Consumption (MWh)[1]	188,378	215,340
Annual Lighting Electricity Consumption (MWh)[2]	18,838	21,534
Annualized Average % of Facility Upgraded[3]	69%	100%
Efficiency Improvement (%)[4]	50%	50%
Reduced Electricity (MWh)[5]	6,476	10,767
Average Electricity Emission Factor Assuming Implementation of Action E1-1 (MT CO_2e/MWh)[6,7]	0.129	0.0
Avoided GHG Emissions (MT CO_2e)[7]	**833**	**0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; kWh =-kilowatt-hour; MWh = megawatt-hour

Values have been rounded and may not add up exactly.

[37] https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/how-energy-efficient-light

[38] Lighting conservatively assumed to make up 10% of total energy use based on CalEEMod defaults for warehouses, where lighting makes up 6-50% of total electricity use (CalEEMod). Additionally, U.S. EPA suggests that lighting makes up 35-45% of building energy use for water treatment systems (https://www.epa.gov/sites/production/files/2015-04/documents/epa816f13004.pdf), however because not all energy uses for Metropolitan are related to building energy use, the lighting demand of overall electricity demand is likely lower.

[1] The amount of electricity consumed in 2030 and 2045 was forecasted based on the amount of electricity purchased in 2016 through 2019 and scaled based on the anticipated increase in water delivery in 2030 and 2045 as detailed in the 2020 RUWMP.

[2] Lighting conservatively assumed to make up 10% of total energy use based on CalEEMod defaults for warehouses, where lighting makes up 6-50% of total electricity use (CalEEMod).

[3] Percent upgrade based on a linear increase in retrofit buildings of 50% by 2027 and 100% in 2035.

[4] Assumed that lighting improvements are half LED and half high efficiency bulbs resulting in approximately 50 percent reduction in energy usage (https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money/how-energy-efficient-light).

[5] Reduced electricity is based on 69 percent of current electricity usage for lighting being improved by 50 percent by 2030 and 100 percent of current electricity usage for lighting being improved by 50 percent starting in 2035 through 2045.

[6] Due to RPS, retail electricity emission factors (i.e., IID and SCE), will reduce over time. As described in *Section 2.1, Assumptions*, annual electricity emission factors for IID and SCE are interpolated based on the 2018 emission factor and percent of renewable sources and the 2030 emission factor that would result with the required 60% renewable sources. The presented emission factor is the weighted average retail electricity emission factors based on the average contribution of overall electricity by IID and SCE to CVWD electricity consumption with implementation of Measure E-1 where SCE and IID accounts would be switched to 50% Green Rate by 2022.

[7] Between 2016 and 2019, IID provided on average 45% of CVWD's overall electricity while SCE provided on average 55% of the overall electricity.

[8] Avoided GHG emissions is calculated as the Reduced Electricity multiplied by the weighted electricity emission factor with incorporation of Action E1-1 as described in note 6 and 7.

ACTION EE1-7: CONTINUE CVWD'S TIME OF USE PROGRAM THAT IDENTIFIES AND ESTABLISHED PERMANENT SHIFTS OF HIGH-ELECTRICITY USE TO TIMES WHEN RENEWABLE ENERGY IS PLENTIFUL THROUGH EDUCATIONAL PROGRAMS ON ENERGY AND THERMAL STORAGE, LOAD TIMING/CONTROLS, PRE-COOLING/PRE-HEATING, AND OTHER TIME-ENERGY DEMAND MEASURES. (SUPPORTIVE)

CVWD currently has a time-of-use program utilized to lower energy use and cost. Under Action EE1-7, CVWD will continue to implement this program but also consider time-of-use adjustments that would have a GHG emission reduction impact when renewable energy is plentiful. As CVWD's greatest source of emissions is currently associated with electricity usage, continuing to identify opportunities to make permanent shifts in high-electricity operations can have a significant impact on GHG emissions. Because specific time-of-use shifts have not been identified, this action is not considered quantifiable at this time. With identification of specific opportunities to employ time-of-use, this action could result in measurable GHG emission reductions.

ACTION EE1-8: CONTINUE TO IDENTIFY OPPORTUNITIES TO DEVELOP AND PROFILE NOTABLE ENERGY EFFICIENCY PROJECTS. TRACK ENERGY REDUCTION FROM IMPLEMENTATION OF ENERGY EFFICIENCY PROJECTS AND PREPARE A REPORT DETAILING SUCCESSES FOR INTERNAL STAKEHOLDERS BY 2030. (SUPPORTIVE).

This action is considered supportive of Measure EE1 as it provides education to internal stakeholders and the public on successful energy efficiency projects conducted at CVWD. This has the potential to garner further interest and support for future energy efficiency projects.

Results

As shown below in Table 20, Measure EE1 has the potential to reduce GHG emissions by approximately 2,965 MT CO_2e by 2030. As previously discussed, the potential reduction of GHG emission achieved by Measure EE1 are dependent on the level of implementation of the quantifiable actions (i.e. Action EE1-3 and EE1-6) and level of implementation of Measure E1. It was assumed that as part of Measure E-1 implementation CVWD will switch retail accounts from the standard package to the SCE Green Rate option and to the IID Green Energy Program option. These green packages provide electricity from at least 50 percent renewable sources and therefore have a lower emission rate than the standard electricity packages. The calculated emissions reduction

potential from implementation of Measure EE-1 account for the green rate package emission factors. This calculation will be updated in future CAAP updates to account for changes in electricity emission factors and any changes in CVWD's implementation of Measure E-1. the green rate packages.. Regardless of emissions reduction from implementation of Measure EE-1, reducing electricity demand has the potential to reduce costs and need for carbon-free electricity.

Table 20 GHG Emissions Reduction Associated with Measure EE1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
EE1-1 As part of the Asset Management program, identify aging equipment due for replacement throughout CVWD facilities and identify energy efficient alternatives to use for the replacement (e.g., EnergyStar certifications). Include a return on an investment analysis as part of the replacement process that evaluates the capital investment for an energy efficient alternative piece of equipment, cost savings associated with improved energy efficiency, and identifies any grants or rebates associated with such equipment replacement.	Supportive	
EE1-2 Continue to conduct energy audits annually and implement top energy recommendations. As part of CAAP monitoring, track energy improvements due to implementation of energy audit recommendations annually.	Supportive	
EE1-3 Based on the recommendations from *Coachella Valley Water District WRP Energy Optimization Evaluation*, implement the top Energy Efficiency Measures (EEM) at WRP 4, WRP 7 and WRP 10 with a Benefit-to-Cost Ratio Greater than 1.0 by 2030. The identified EEM are aligned with the Sanitation Master Plan and include energy optimization such as aeration improvements, treatment optimization, improved site and building lighting, and addition of solar panels to the WRPs.	2,132	0
EE1-4 Develop a policy that would require any new CVWD building to achieve a minimum level of LEED Gold certification or LEED equivalent to improve energy efficiency and reduce cost based on high return on investment greater than 20%.	Supportive	
EE1-5 Continue to utilize automated lighting controls for indoor/outdoor lighting for CVWD campuses pursuant to the current CEC Building Energy Efficiency Standards (Title 24, Part 6 and 11).	Supportive	
EE1-6 Pursuant to the CEC 2019 Building Energy Efficiency Standards (Title 24, Part 6 and 11), require all new construction and building upgrades utilize light emitting diode (LED) lighting technology only. Establish goal to convert all interior and exterior lighting at 50% of CVWD facilities to LED technologies by 2027 and 100% by 2035.	833	0
EE1-7 Continue CVWD's time of use program that identifies and established permanent shifts of high-electricity use to times when renewable energy is plentiful through educational programs on energy and thermal storage, load timing/controls, pre-cooling/pre-heating, and other time-energy demand measures.	Supportive	
EE1-8 Continue to identify opportunities to develop and profile notable energy efficiency projects. Track energy reduction from implementation of energy efficiency projects and prepare a report detailing successes for internal stakeholders by 2030.	Supportive	
Total Emissions Reduction Potential	**2,965**	**0.0**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

2.4 Scope 3: Indirect Emissions and Sequestration

Measure WG1: Increase waste diversion to achieve 75% reduction in landfilled organic waste by 2025 and zero-waste by 2045

Organic materials are the focus of the recent California legislation SB 1383 (Short-Lived Climate Pollutants: Organic Waste Reductions). This state law has the immediate goal of reducing organic waste sent to landfill and the ultimate objective of reducing statewide methane emissions. Specifically, it sets a statewide goal for the reduction in organic waste to landfills – 50 percent by 2020 and 75 percent by 2025 – in addition to the recovery of 20 percent of edible food waste for human consumption. SB 1383 will require local governments to provide organics collection to all generators and require all generators to subscribe. It also has specific mandates for container systems, education and outreach programs, monitoring and contamination reporting, and enforcement of regulations. Full SB 1383 implementation will begin in 2022, allowing some time for jurisdictions to plan and prepare for achieving compliance.[39] CVWD does not dispose of biosolids at landfills in California; therefore, SB 1383 has a limited impact on CVWD other than requiring that CVWD achieve a 75 percent diversion of organics by 2025, using 2014 levels as the baseline. While SB 1383 does require this reduction from CVWD, SB 1383 was not included in the CVWD's GHG emissions forecast. Therefore, this plan includes measures that will allow CVWD to support this goal and reduce its own GHG emissions in alignment with SB 1383.

Waste generation at CVWD facilities accounts for less than one percent of total GHG emissions from CVWD operations. A majority of the GHG emissions resulting from waste sent to the landfill are caused by decomposition of organic material under anaerobic conditions. The remainder of the emissions come from inorganic wastes, such as plastic, which have both upstream and downstream emissions. Although CVWD currently generates very little waste annually, under Measure WG1 CVWD will align with SB 1383 and AB 341 to develop and implement a waste diversion plan to reduce organic waste sent to the landfill by 75 percent using 2014 levels as a baseline and strive to achieve zero-waste sent to landfills by 2045.

Methodology and Assumptions

ACTION WG1-1: CONDUCT A WASTE AUDIT BY 2023 TO DETERMINE WHAT PERCENTAGE OF THE WASTE STREAM IS ORGANIC COMPARED WITH THE WASTE STREAM IN 2014 AND THEREFORE, SUBJECT TO SB 1383. (SUPPORTIVE)

Conducting a waste audit to characterize CVWD's generated waste will allow CVWD to be more strategic with follow-up actions or programs. Waste characterization under Action WG1-1 will incrementally support Measure WG1 by helping CVWD to identify what specific waste types to target for diversion under various programs and to establish diversion goals by waste type that will align with State regulations.

ACTION WG1-2: EXPAND CVWD'S CURRENT WASTE MANAGEMENT BY DEVELOPING NET-ZERO WASTE POLICIES AND PROGRAMS AT ALL FACILITIES TO REDUCE LANDFILLED ORGANIC WASTE BY 75% BY 2025

[39] California Air Resources Board. 2017. Short-Lived Climate Pollution Reduction Strategy.

FROM 2014 LEVELS AND ACHIEVE ZERO LANDFILLED WASTE BY 2045 IN ALIGNMENT WITH AB 341 AND SB 1383.

Action WG1-2, the implementation of net zero waste policies and programs at all CVWD facilities, generates all the emissions reduction associated with Measure WG1 by reducing landfilled waste to net-zero by 2045.

Direct GHG emissions reductions from this strategy are dependent on the active diversion of waste from the landfill. Therefore, for the purposes of this calculation, it is assumed that through the adoption of the CAAP, CVWD would aim to reach net-zero waste by 2045. Because a majority of future growth in CVWD operations is related to increases in water deliveries, CVWD waste generation emissions were forecasted to future years by applying a growth factor based on water deliveries. See Appendix A for inventory and forecast calculation details. 2019 baseline waste emissions were calculated by applying the default emission factor for municipal solid waste (MSW and default factors for landfill operations (i.e., oxidation rate, landfill gas collection rate, landfill equipment). It was assumed that the type of waste generated and the landfill currently used would remain constant over time. Therefore, emission reduction calculations assume a linear reduction of waste emissions starting in 2023 with 100 percent reduction achieved by 2045. Linear interpolation between 2023 and 2045 shows that this correlates with a reduction of waste emissions by approximately 36 percent by 2030. The calculations and assumptions used to estimate potential emissions reduction from Action WG1-2 are provided in Table 21.

Table 21 Action WG1-2 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Annual Waste Growth Factor (MT CO_2e/AF)[1]	0.0002	0.0002
Forecasted Waste Emissions (MT CO_2e)[2]	28	32
Percent Reduction in Waste Emissions [3]	36.4%	100%
Avoided GHG Emissions (MT CO_2e)[7]	**10**	**32**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; AF = acre foot

Values have been rounded and may not add up exactly.

[1] Baseline waste emissions were calculated for inventory years 2016 through 2019. Based on the amount of water delivered each year, an average waste growth factor in waste emissions per acre foot of water delivered was developed and used to estimate future waste emissions given anticipated water deliveries.

[2] Waste emissions were forecasted by multiplying the annual waste growth factor by the anticipated water deliveries reported in the 2020 RWUMP.

[3] Based on the linear interpolation of waste reduction from 0 percent in 2023 to 100 percent by 2045 and assuming a direct correlation with generated waste emissions.

[4] Potential GHG emissions avoided from waste diversion from landfills is calculated as the percent of waste reduction multiplied by the forecasted waste emissions in the target year (i.e. 2030, and 2045).

ACTION WG1-3: CONTINUE TO IMPLEMENT ORGANIC WASTE DIVERSION STRATEGIES WHERE GREEN AND WOOD WASTE IS SEPARATED FROM OTHER WASTE STREAMS, AND SENT TO THE GREENLEAF BIOMASS POWER PLANT IN MECCA OR OTHER BIOMASS/RENEWABLE ENERGY CENTER. (SUPPORTIVE)

Continuing Action WG1-3 will incrementally support Measure WG1, by reducing landfilled organic waste. Further, separating wood and green wastes from the waste streams allows for this waste to become productive and be used to create power.

ACTION WG1-4: INVESTIGATE FUNDING OPPORTUNITIES TO DEVELOP AN ORGANICS PROGRAM AND DEPLOY ORGANIC WASTE BINS AT ALL CVWD FACILITIES SUCH THAT ORGANICS GENERATED FROM CVWD OPERATIONS IS COLLECTED AND DIVERTED FROM THE LANDFILL BY 2025. (SUPPORTIVE)

Identifying funding opportunities will support future programs to help reduce waste in the community and bring down waste related emissions. Such programs may include composting at waste facilities, which can be used for compost application related to carbon farming. This action supports innovative strategies for diverting waste from the landfill by 2025 in congruence with SB 1383. Further this action supports the CAAP's long-term planning efforts, as well as developing partnerships that will allow CVWD to reach a zero waste goal by 2045 while supporting local communities.

ACTION WG1-5: PURSUANT TO AB 901, REPORT THE QUANTITY AND DESTINATION OF DISPOSED BIOSOLIDS FROM WASTEWATER TREATMENT PLANTS TO CALRECYCLE QUARTERLY. (SUPPORTIVE)

As a biosolid generator, CVWD is subject to the requirements of AB 901, which require each wastewater treatment facility managing biosolids to report to CalRecycle the quantity and destination of biosolids that are disposed of, sold or transferred inside or outside the state every quarter. This action continues a reporting process to CalRecycle and ensures CVWD is in compliance with current laws while supporting Measure WG1.

Results

Table 22 summarizes the actions associated with Measure WG1 and potential GHG emissions reduction. Action WG1-2 would result in a potential reduction of approximately 10 MT CO_2e by 2030 and approximately 32 MT CO_2e by 2045 with the achievement of net-zero waste by 2045.

Table 22 GHG Emissions Reduction Associated with Measure WG1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
WG1-1 Conduct a waste audit by 2023 to determine what percentage of the waste stream is organic compared with the waste stream in 2014 and therefore, subject to SB 1383.	Supportive	
WG1-2 Expand CVWD's current waste management by developing net-zero waste policies and programs at all facilities to reduce landfilled organic waste by 75% by 2025 from 2014 levels and achieve zero landfilled waste by 2045 in alignment with AB 341 and SB 1383.	10	32
WG1-3 Continue to implement organic waste diversion strategies where green and wood waste is separated from other waste streams, and sent to the Greenleaf Biomass Power Plant in Mecca or other biomass/renewable energy center.	Supportive	
WG1-4 Investigate funding opportunities to develop an organics program and deploy organic waste bins at all CVWD facilities such that organics generated from CVWD operations is collected and diverted from the landfill by 2025.	Supportive	
WG1-5 Pursuant to AB 901, report the quantity and destination of disposed biosolids from wastewater treatment plants to CalRecycle quarterly.	Supportive	
Total Emissions Reduction Potential	**10**	**32**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent

Measure TR1: Incentivize Sustainable Commutes

CVWD does not have direct control over how its employees travel to and from their jobs. However, Measures TR1 focuses on initiatives that promote and facilitate alternative commute strategies including use of active and shared/subsidized transit, as well as ZEVs. GHG emissions reduction quantification was based on measures that improve infrastructure, facilitate ZEV commuting, and operational policy changes that would reduce employee vehicle miles travelled (VMT) on an annual basis. The following section details the actions relating to Measure TR1 as well as the methodologies and assumptions used for the GHG emissions reduction calculations associated with the quantifiable measures which include Action TR1-3 and Action TR1-5.

Methodology and Assumptions

ACTION TR1-1: CONTINUE TO CONDUCT ANNUAL SCAQMD TRANSPORTATION SURVEYS TO MONITOR CVWD EMPLOYEES NEEDS AND MOTIVATION FOR TRAVELLING BY SINGLE OCCUPANCY VEHICLES VERSUS ALTERNATIVES. BASED ON SURVEY RESULTS, EXPAND OR PROMOTE PROGRAMS AND INCENTIVES THAT HAVE PROVEN SUCCESSFUL STRATEGIES IN REDUCING EMPLOYEE VMT. (SUPPORTIVE)

This supports CVWD's compliancy with SCAQMD Rule 2022. Additionally, data from the surveys can help inform policy and program creation at CVWD for commuters to strategically. This is considered a supportive action that will inform new actions as well as additional actions under this measure to assess employee needs for traveling by single occupancy vehicles.

ACTION TR1-2: CONTINUE TO OFFER RIDESHARE INCENTIVES TO EMPLOYEES WHO CARPOOL. CONSIDER OFFERING OTHER INCENTIVES TO EMPLOYEES TO USE AN ALTERNATIVE MODE OF TRANSPORTATION TO COMMUTE (E.G. PUBLIC TRANSPORTATION, BIKES). (SUPPORTIVE)

Supporting alternative modes of transit is important to making employee commutes more sustainable. This action continues existing incentives and encourages evaluating additional alternative transportation incentives.

ACTION TR1-3: CONTINUE TO ALLOW ALL EMPLOYEES LOCATED AT CVWD PALM DESERT AND COACHELLA CAMPUSES TO UTILIZE FLEXIBLE 9/80 SCHEDULE THROUGH 2030 TO REDUCE TRAVEL TIME, VMT, AND GHG EMISSIONS.

GHG emissions reduction associated with implementation of Action TR1-6 are calculated as the emissions avoided from the reduction in commuter VMT from vehicles with internal combustion engines. CVWD's 2019 commuter survey included data on the mode of transport and number of trips each employee engages in weekly. Based on the employees home zip code, the number of one-way miles travelled by each employee to commute to work was estimated. Annual commuter VMT for a particular mode of transport was calculated as the average commuter trip distance multiplied by the number of weekly trips multiplied by 50 weeks to account for a two week vacation. For the purposes of this calculation, the total VMT reported in the 2019 commuter survey was used as the baseline and assumed to remain constant over time. Further, commuter trips associated with walking or bicycling were excluded as only modes of transport that generate GHG emissions were considered. In 2019, there was an estimated 1,323,243 miles travelled by commuters via an internal combustion engine (ICE) vehicle, 10,662 miles traveled by motorcycle, and 11,846 miles travelled by

a ZEV, which totals to approximately 1,345,751 miles travelled by a mode of transport generating GHG emissions.

CVWD currently allows a flexible schedule for all employees however this was not accounted for in the inventory or forecast as the number of employees utilizing a flexible schedule may fluctuate over time. Under Action TR1-3, CVWD will continue to offer and encourage employees to utilize a 9/80 flexible schedule. CVWD has indicated that a majority of staff utilize the 9/80 schedule. Therefore, for the purposes of this calculation it is assumed that CVWD would maintain a 9/80 schedule for at least 85 percent of all staff now through 2045. Studies have found that the percent reduction in VMT associated with flexible work schedules is based on the type of flexible work schedule and employee participation.[40] For a 9/80 schedule, the adjustment factor, or slope of the linear trend between employee participation and corresponding reduction in VMT is 0.07. As such, with 85 percent employee participation, VMT could be reduced by approximately 6 percent annually, which equates to a reduction in VMT of approximately 80,072 miles annually. Annual avoided emissions were calculated by multiplying the annually reduced VMT by the annual commuter emission factor with implementation of Action TR1-4. The annual commuter emission factor was calculated as the total estimated emissions from commuting divided by the total commuter miles travelled assuming implementation of Action TR1-4. Emissions factors derived from the EMFAC2017 model were used to estimate GHG emissions from personal vehicle commutes and CAMX electricity emission factors were used to calculate emissions from the transition to EV vehicles. Annual emission factors were interpolated between 2019 and the forecasted commuter emissions in 2030 and 2045, where the emission factor was 0.000329 MT CO_2e/commuter mile in 2019, 0.00021 MT CO_2e/commuter mile in 2030, and 0.00015 MT CO_2e/commuter mile in 2045. Emission factors decrease due to improved vehicle emissions and from the incorporation of Action TR1-4 where ICE vehicles are transitioned to ZEVs or EVs. Total emissions from employee commute in 2019 and forecasted in 2030 and 2045 were calculated using annual mileage travelled by mode multiplied by the associated emission factor.[41]

The calculations and assumptions used to estimate emissions reduction from Action TR1-3 are provided in Table 23. The avoided emissions are calculated as the annual avoided VMT multiplied by the annual commuter emission factor. This results in a reduction of 17 MT CO_2e by 2030 and 12 MT CO_2e by 2045.

Table 23 Action TR1-3 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
Annual Commuter VMT [1]	1,345,751	1,345,751
Participation (%)	85%	85%
% VMT Reduced[2]	6%	6%
Annual Commuter VMT Reduced	80,072	80,072
Commuter GHG Emission Factor with Implementation of Action TR1-4 (MT CO_2e/commuter mile)[3]	0.000211	0.000147
GHG Emissions Avoided (MT CO_2e)[4]	**17**	**12**

[40] CAPCOA TRT-6 http://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoa-quantifying-greenhouse-gas-mitigation-measures.pdf

[41] The employee commute emission factor was calculated as the total commuter emissions divided by the annual commuter VMT where 2019 data served as the baseline for the inventory and future forecasted years were scaled based on the 2019 inventory. For data details see Appendix A – GHG Inventory and Forecast, of Coachella Valley Water District Climate Action and Adaptation Plan

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; VMT = vehicle miles travelled; EV = electric vehicle; ZEV = zero-emission vehicle; ICE = internal combustion engine

Values have been rounded and may not add up exactly.

[1] CVWD 2019 commuter survey provided the number of trips travelled per week including mode of transport. Annual commuter VMT was estimated as the number of commuter trips by mode of transport multiplied by the average mileage per commuter trip multiplied by 50 weeks per year to account for a 2 week vacation. Average commute distance per employee was estimated based on the provided zip codes of all employees and the assumption that each employee commutes to the CVWD campus nearest their zip code.

[2] Percent VMT reduction is based on the linear trend between employee participation and % reduction in commuter VMT for a 9-day/80-hour work week (CAPCOA TRT-6). As a 2045 target was not set in the measure, it is assumed that the trends stay constant post 2030. http://www.aqmd.gov/docs/default-source/ceqa/handbook/capcoa-quantifying-greenhouse-gas-mitigation-measures.pdf

[3] A commuter emission factor (MT CO_2e/commuter mile) was developed based on the total emissions from commuting and total commuter miles travelled. This commuter emission factor was calculated for CVWD's 2019 inventory and forecasted out for 2030 and 2045 to account for changes in emission factors by mode (i.e., single occupancy vehicles, EV penetration). For Action TR1-3 calculations it was assumed that Action TR1-4 was implemented to account for further adjustments to the commuter emission factor due to increased use of EV/ZEVs as a replacement to ICE commuter vehicles.

[4] Avoided GHG emissions is calculated as the reduced VMT multiplied by the commuter emission factor.

ACTION TR1-4: CONDUCT A ZEV/EV FEASIBILITY STUDY BY 2026 TO INVESTIGATE FUNDING OPPORTUNITIES OR PARTNERSHIPS TO INSTALL ZEV/EV INFRASTRUCTURE AT CVWD FACILITIES AND TO DETERMINE THE NUMBER AND LOCATIONS MOST EFFECTIVE FOR ZEV/EV INFRASTRUCTURE INSTALLATION. DISCUSS WITH SCE THEIR CURRENT PILOT PROGRAMS TO INSTALL INFRASTRUCTURE AT WORKPLACES AND EVALUATE FUTURE OPPORTUNITIES FOR CVWD TO HOST PILOT PROGRAM. (SUPPORTIVE)

In order to achieve a zero-emission transportation sector, California has several policies and programs designed to provide incentives, rebates, or credit generating opportunities for both ZEV drivers and the deployment of ZEV infrastructure. There may be opportunities for CVWD to develop partnerships, receive rebates, or generate credits for installing ZEV infrastructure at CVWD campuses for employees and public visitors. This has the potential to reduce GHG emissions from CVWD employees' commutes as well as potentially offset the cost of ZEV infrastructure deployment. Some policies will scale back rebates or incentives as the market reaches self-sustainability, as such early adopters have greater access to incentives. Under this action, CVWD would evaluate incentives, credit generating opportunities, partnerships, and the return on investment to provide ZEV infrastructure for employees and visitors which would further encourage employees to drive personal ZEVs and maximize emissions reduction potential from Measure TR1.

ACTION TR1-5: BASED ON FUNDING AND ZEV/EV FEASIBILITY STUDY, INSTALL ZEV AND/OR EV INFRASTRUCTURE TO SUPPORT AT LEAST A 15% TRANSITION TO ZEVS/EVS BY 2030 AND 30% BY 2045.

CVWD does not have direct control over how its employees travel to and from their jobs. However, by providing EV charging or ZEV fueling infrastructure, CVWD can encourage employees to drive personal EVs or ZEVs, and shift how some individuals commute to work. One recognized hurdle for the use of EVs is range. By allowing employees to charge their vehicles during work, CVWD encourages the use of EVs. Estimates indicate that approximately 98 percent of EV charging occurs either at home or at work with 40 percent of charging events happening at work.[42] Based on current passenger vehicle registration and California's zero-emission vehicle market development strategy, including the Zero-Emission Vehicle Regulation, N-79-20, and Executive Order B-48-18, it is anticipated that by 2030 at least 15 percent of passenger vehicles on the road in California will be ZEVs.[43] As such, it is reasonable to assume the CVWD employees will follow a similar trend. The

[42] https://avt.inl.gov/sites/default/files/pdf/arra/PluggedInSummaryReport.pdf

[43] https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/summary-california-vehicle-and-transportation#:~:text=Data%2C%20Facts%2C%20%26%20Statistics%20Vehicles%20%28As%20of%2010%2F1%2F2015%29,29%2C830%2C797%20Total%20registered%20light-duty%20cars%20in%20California%3A%2016%2C101%2C262

number of employee commuting trips utilizing an ICE car to drive alone, or carpool is tracked in CVWD's 2019 commuter survey which tracks the number of employees commuting to work by car. According to the 2019 survey, on a weekly basis there are approximately 1,117 commuter trips conducted using an ICE vehicle. Based on the assumption that employees commute 50 weeks out of the year, including a 2 week vacation, and that the trip length of an employee's commute is on average 23.7 miles, in 2019 approximately 1,323,243 commuter miles were traveled in an ICE vehicle. It was assumed that under Action TR1-5, that EVs would be the predominant ZEV option that employees would transition to based on current market availability.

GHG emissions reduction from this measure are calculated as the difference in emissions generated from those employees commuting via an ICE vehicle fueled by fossil fuels and the emissions generated indirectly from electricity use to charge the EVs. Electricity consumptions for EV charging was calculated as the number of commuter miles transitioned from ICE vehicles to EVs multiplied by the equivalent electricity fuel efficiency. Equivalent electricity consumption needed to accommodate the switch is based on the average EV efficiency (34 kwh/100miles).[44] For the purposes of this calculation it is assumed that employees would charge vehicles at work to cover the commuting needs. As such, emissions generated from EV charging were calculated as the annual electricity consumption needed to accommodate all commuter VMT that transitioned to EVs with implementation of Action TR1-5 multiplied by the annual weighted electricity emission factor for the target year (i.e. 2030 and 2045). The weighted electricity emission factor was further adjusted to account for implementation of Measure E1, Action E1-1, specifically the switch of retail accounts to a 50 percent renewable energy options for all retail electricity sources. Incorporation of Action E1-1 would further reduce electricity emissions generated from EV charging. This results in a generation of approximately 8 MT CO_2e in 2030 and 0 MT CO_2e in 2045 due to electricity use from EV charging associated with the implementation of Action TR1-5.

The GHG emissions that would be avoided by the commuter population transitioning to EVs is based on the assumption that approximately 15 percent and 30 percent of VMT generated annually from traditional ICE vehicles would be avoided by 2030 and 2045, respectively. Annual commuter VMT from ICE vehicles is based on CVWD's 2019 commuter survey. As shown in Table 24, it was estimated that approximately 198,486 miles and 396,973 miles travelled by ICE-vehicles would be replaced by EVs if 15 percent and 30 percent, respectively, of commuters transitioned to EVs given 1,323,243 annual commuter miles. GHG emissions generated from ICE-vehicles was calculated as the annual VMT multiplied by the annual running emission factor for ICE-vehicles obtained from EMFAC2017.[45] Emission factors are weighted based on the percent of fuel type used per category of vehicle class (i.e., passenger vehicle). Because vehicle emissions are improving overtime, the annual emission factor applied to the annual vehicle miles travelled was interpolated between average vehicle emission factors in 2019 and anticipated in 2030 and 2045 using EMFAC2017 data.[46] The calculations and assumptions used to estimate emissions reduction from Action TR1-5 are provided in Table 24. As shown, with the implementation of Measure E1 and the transition of 15 percent and 30 percent of commuting from ICE-vehicles to EV, the GHG emissions avoided in 2030 would be approximately 40 MT CO_2e and 84 MT CO_2e by 2045.

[44] https://ecocostsavings.com/average-electric-car-kwh-per-mile/#:~:text=The%20average%20electric%20car%20kWh%20per%20100%20miles,100%20miles%20and%200.346kWh%20to%20travel%201%20mile.
[45] https://arb.ca.gov/emfac/2017/

[46] Annual emission factors were interpolated between 0.00033 MT CO_2e/mile in 2019 and 0.00024 MT CO_2e/mile in 2030 and 0.00021 MT CO_2e/mile in 2045.

Table 24 Action TR1-5 GHG Emissions Reduction Calculations

Calculation Factor	2030	2045
ICE Commuter VMT[1]	1,323,243	1,323,243
% of Commuters that Switch to EV Use [2]	15%	30%
ICE-vehicle VMT Replaced with EVs (VMT)[3]	198,486	396,973
Average Weighted ICE Emission Factor (MT CO_2e/mile)[4]	0.00024	0.00021
Annual Emissions from ICE-vehicle VMT if not replace with EVs (MT CO_2e)	48	84
Annual Electricity Demand (kWh/year)[5]	67,485	134,971
Annual Electricity Demand (MWh)	67	135
Average Electricity Emission Factor Assuming Implementation of Action E1-1 (MT CO_2e/MWh)[6,7]	0.129	0.0
Emissions from EV Charging (MT CO_2e)[8]	9	0
GHG Emissions Avoided (MT CO_2e)[9]	**39**	**84**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; VMT = vehicle miles travelled; MWh = megawatt-hour; kWh =-kilowatt-hour; ICE = internal combustion engine; EV = electric vehicle

Values have been rounded and may not add up exactly.

[1] CVWD 2019 commuter survey provided the number of trips travelled per week including mode of transport. Annual commuter VMT was estimated as the number of commuter trips by mode of transport multiplied by the average mileage per commuter trip multiplied by 50 weeks per year to account for a 2 week vacation. Average commute distance per employee was estimated based on the provided zip codes of all employees and the assumption that each employee commutes to the CVWD campus nearest their zip code.

[2] Assumed 15% of total commuter VMT would be replaced with EVs with implementation of Action TR1-4 by 2030 and 30% by 2045. These percentages of EV adoption are in alignment with anticipated state trends.

[3] Assumed 15% and 30% of total commuter VMT would be replaced with EVs with implementation of TR1-4.

[4] Annual emission factors were obtained from EMFAC2017 for 2019, 2030 and 2045. Emission factors were weighted based on fuel type per vehicle class (i.e., passenger vehicles).

[5] Equivalent electricity consumption needed to accommodate the switch is based on the average EV efficiency (34 kwh/100miles).

[6] Due to RPS, retail electricity emission factors (i.e., IID and SCE), will reduce over time. As described in *Section 2.1, Assumptions*, annual electricity emission factors for IID and SCE are interpolated based on the 2018 emission factor and percent of renewable sources and the 2030 emission factor that would result with the required 60% renewable sources. The presented emission factor is the weighted average retail electricity emission factors based on the average contribution of overall electricity by IID and SCE to CVWD electricity consumption with implementation of Measure E-1 where SCE and IID accounts would be switched to 50% Green Rate by 2022.

[7] Between 2016 and 2019, IID provided on average 45% of CVWD's overall electricity while SCE provided on average 55% of the overall electricity.

[8] Emissions associated with charging of EV chargers is calculated as the electricity demand in the target year multiplied by the average weighted electricity emission factor assuming implementation of Measure E1.

[9] Avoided emissions are calculated by subtracting the Emissions from EV charging from the Emissions from ICE-vehicle VMT.

ACTION TR1-6: EXPAND PROVIDED PREFERRED PARKING FOR EV/ZEVS TO INCENTIVIZE USE OF ZEVS/EVS BY EMPLOYEES. (SUPPORTIVE)

This action supports Measure TR1 by expanding opportunity for zero emission vehicles and other electric vehicles to have parking spaces designated for these types of vehicles only. The impact of this incentive on rate of ZEV adoption is unknown; therefore, is not consider quantifiable.

ACTION TR1-7: PROMOTE EMPLOYEE USE OF CARBON-FREE AND LOW CARBON TRANSPORTATION BY PROVIDING EDUCATIONAL MATERIALS (E.G. FLYERS IN BREAK ROOMS, INFO ON TRANSPORTATION SURVEY, INFO ON WEBSITES) ON THE BENEFITS OF COMMUTE OPTIONS INCLUDING PUBLIC TRANSPORTATION, EV/ZEV OPTIONS, AND VANPOOLS. (SUPPORTIVE)

Providing education to staff on the use of new programs and policies is a fundamental component of achieving significant and impactful change. The educational material should provide clear

information on the various commute options available to CVWD employees including public transportation, ZEV/EV options, and vanpools as well as the benefits to each option. Action TR1-7 supports Measure TR1 by providing education to motivate commuters to utilize less GHG emitting commuter options. However, the impacts of education on employee's commuter behavior is not quantifiable, therefore, potential GHG reductions from Action TR1-6 was not quantified and the action is considered supportive.

Results

Table 25 summarizes the actions associated with Measure TR1 and potential GHG emissions reduction. Action TR1-3 and Action TR1-5 have the potential to reduce GHG emissions by approximately 56 MT CO_2e by 2030 and 95 MT CO_2e by 2045.

Table 25 GHG Emissions Reduction Associated with Measure TR1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
TR1-1 Continue to conduct annual SCAQMD transportation surveys to monitor CVWD employees needs and motivation for travelling by single occupancy vehicles versus alternatives. Based on survey results, expand or promote programs and incentives that have proven successful strategies in reducing employee VMT.	Supportive	
TR1-2 Continue to offer rideshare incentives to employees who carpool. Consider offering other incentives to employees to use an alternative mode of transportation to commute (e.g. public transportation, bikes).	Supportive	
TR1-3 Allow all employees located at CVWD Palm Desert and Coachella Campuses to utilize flexible 9/80 schedule through 2030 to reduce travel time, VMT, and GHG emissions.	17	12
TR1-4 Conduct a ZEV/EV Feasibility Study by 2026 to investigate funding opportunities or partnerships to install ZEV/EV infrastructure at CVWD facilities and to determine the number and locations most effective for ZEV/EV infrastructure installation. Discuss with SCE their current pilot programs to install infrastructure at workplaces and evaluate future opportunities for CVWD to host pilot program.	Supportive	
TR1-5 Based on funding and ZEV/EV Feasibility Study, install ZEV and/or EV infrastructure to support at least a 15% transition to ZEVs/EVs by 2030 and 30% by 2045.	39	84
TR1-6 Expand provided preferred parking for EV/ZEVs to incentivize use of ZEVs/EVs by employees.	Supportive	
TR1-7 Promote employee use of carbon-free and low carbon transportation by providing educational materials (e.g. flyers in break rooms, info on transportation survey, info on websites) on the benefits of commute options including public transportation, EV/ZEV options, and vanpools.	Supportive	
Total Emissions Reduction Potential	**56**	**95**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; ZEV = zero emission vehicle; EV = electric vehicle

Measure WC1: Increase Water Conservation and Local Water Supply

As discussed, most of CVWD's emissions are a result of pumping, treatment, and delivery of water to its customers. Water conservation strategies that reduce per capita water consumption indirectly reduce energy emissions used to supply water and provide a co-benefit of protecting one of California's scarcest resources, water.

CVWD has a long history of incentivizing water conservation, which has resulted in measurable reductions in retail water usage (and CVWD's GHG emissions). CVWD has had a number of successful water conservation programs such as turf reduction on golf courses, providing rebates for water efficient appliances, practicing xeriscaping, and developing education programs for specific customer groups such as the Agricultural Water Advisory Group. CVWD achieved a 20 percent reduction in per capita water use as required by the Water Conservation Act of 2009, and plans to continue and expand its water conservation efforts to align with future water conservation policies. As a water supplier, CVWD is subject to the requirements of the various State policies, regulations, and requirements imposed on water suppliers. CVWD complies with regulatory requirements and actively engages in water conservation efforts. Reduced per capita water consumption allows CVWD to meet the water demands of a growing population and reduce operational emissions.

Measure WC1 involves several different types of measures for water conservation including measures that promote water conservation by consumers, implementation of water conservation programs and initiatives, and implementation of water efficient practices and technologies. Many of the actions are built on existing water conservation actions that CVWD practices. Measure WC1 is currently made up of supportive actions and is not quantified as the continued water conservation efforts are dependent on receiving adequate funding and future water conservation goals will not be established until updates to the Water Conservation Act are adopted. GHG emission reductions achieved through implementation of Measure WC1 are anticipated to be quantified in future iterations of the CAAP

Methodology and Assumptions

ACTION WC1-1: EXPAND PROGRAMS WHICH EDUCATE CUSTOMERS ON WATER CONSERVATION INITIATIVES THROUGH WORKSHOPS AND SPEAKING ENGAGEMENTS. IN COORDINATION WITH RETAIL WATER SUPPLIERS, HOST REGULAR WORKSHOPS AND CLASSES ON WATER CONSERVATION, INCLUDING PROVIDING INFORMATION ON DROUGHT-TOLERANT LANDSCAPING, AVAILABLE REBATES FOR WATER RETROFITS, AND WATER EFFICIENCY STRATEGIES IN NEW BUILDINGS. CONTINUE TO OFFER WORKSHOPS AND CLASSES EVEN WHEN DROUGHT CONDITIONS ARE NOT PRESENT. DEVELOP OUTREACH MATERIALS FOR WATER CONSERVATION. (SUPPORTIVE)

This action incrementally supports Measure WC1 by providing educational programs throughout the service area to educate customers on water conservation initiatives and strategies. Such educational programs can encourage end user behavioral changes that promote water conservation. However, the impacts of education on customers' behavior is not quantifiable, therefore, the measure is considered supportive.

ACTION WC1-2: CONTINUE TO WORK WITH AGRICULTURAL WATER ADVISORY GROUP TO TEACH FARM OWNERS, MANAGERS, AND IRRIGATORS CONCEPTS IN IRRIGATION WATER AND SALINITY MANAGEMENT AS WELL AS PROMOTE NEW TECHNOLOGY TO HELP THE CONSERVATION EFFORT. APPLY FOR GRANT-

FUNDED AGRICULTURAL REBATE PROGRAMS TO ASSIST THOSE IN THE AGRICULTURE INDUSTRY TO REDUCE WATER USE. (SUPPORTIVE)

This action supports Measure WC1 by providing educational and logistical support to the Agricultural Water Advisory Group to teach water conservation concepts. As CVWD supplies a significant amount of water for irrigation and other agricultural purposes, this action helps to meet the goals of Measure WC1 by promoting water conservation in agricultural practices. Further with obtaining grant funding, CVWD can offer rebate programs to directly assist in reducing water use for agricultural purposes having a measurable impact on GHG emissions. This action is not currently considered quantifiable, however may be quantifiable in the future after grant funding has been secured.

ACTION WC1-3: ANALYZE CURRENT WATER USE REDUCTION PROGRAMS TO IDENTIFY WHICH PROGRAMS HAVE THE HIGHEST ADOPTION RATE AND WATER USE REDUCTION IMPACTS. EXPAND THOSE PROGRAMS WHICH ARE FOUND TO BE MOST EFFECTIVE. (SUPPORTIVE)

This action builds on Action WC1-1 by providing the information needed to expand effective water use reduction programs. This action ensures that water conservation efforts will continue to evolve and improve strategically. Improvements in water conservation programs or technologies can indirectly reduce GHG emissions associated with water management. Because it is unclear to the extent that evaluating existing programs and initiatives or piloting new programs will improve water conservation, Action WC1-3 is not quantified and is considered supportive.

ACTION WC1-4: PREPARE A FORMAL LANDSCAPE MANAGEMENT PLAN FOR CVWD THAT CONSOLIDATES AND EXPANDS UPON THE GOALS AND POLICIES FOR LANDSCAPING AT CVWD PROPERTY. THE PLAN SHOULD IDENTIFY WHETHER AND WHERE THERE ARE RESOURCE-CONSUMPTIVE LANDSCAPES ON CVWD PROPERTY THAT CAN BE CHANGED OUT TO MORE WATER-CONSERVING, SLOWER GROWTH PLANTS THAT REQUIRE LESS MAINTENANCE. CONTINUE TO IMPLEMENT POTABLE WATER CONSERVATION STRATEGIES IN LANDSCAPE DESIGN AND MAINTENANCE (SUCH AS REPLACING WATER INTENSIVE AREAS WITH DROUGHT-RESILIENT NATIVE PLANTS [BERMUDA GRASS], USING LOW-FLOW WATER FIXTURES, INSTALLING SOPHISTICATED IRRIGATION SOFTWARE TO CONTROL WATER, INVESTING IN SYSTEMS TO MONITOR PIPE LEAKAGE, AND LIMITING TURF DEVELOPMENT). (SUPPORTIVE)

Under Action WC1-4, CVWD will ensure that existing or new water-intensive landscaping will replace or use, respectively, more drought-resilient species to practice water conservation. This action show CVWD's commitment to serve as an example of water conservation practices that can be employed. As this action involves the development of the policy and plan, there is no direct quantifiable GHG emission reductions associated with this action.

ACTION WC1-5: REQUIRE NEW OR REDEVELOPED CVWD DEVELOPMENTS TO BE LOW WATER USE THROUGH LANDSCAPING WITH DROUGHT TOLERANT PLANTS, PERMEABLE PAVING, GREEN INFRASTRUCTURE, AND INCORPORATING OTHER LOW-IMPACT DEVELOPMENT DESIGN FEATURES TO ALLOW FOR INCREASED INFILTRATION, EVEN IN HEAVY RAINS. (SUPPORTIVE)

This action builds on Action WC1-5 by requiring that any new or redeveloped CVWD landscapes be consistent with the developed landscape management plan and employ water conservation efforts. As it is unclear what amount of landscaping may be replaced, this action is not considered quantifiable.

Action WC1-6: Continue to promote water conservation through xeriscaping through xeriscape demonstration gardens and educational material. (Supportive)

This supports Measure WC1, by continuing a water conservation program that educates the community about Xeriscaping. Xeriscaping is a design of landscaping that is intended to require little to no irrigation of the plants used. Because it is unclear to the extent that educational programs will improve water conservation throughout the community, Action WC1-6 is not quantified and is considered supportive.

Action WC1-7: Complete and implement Irrigation Master Plan that establishes goals and a timeline for improved water conservation related to irrigation. The Plan should identify the opportunities for replacement of groundwater use for irrigation with recycled water use, including a cost assessment and prioritization of opportunities. (Supportive)

This action directly supports Measure WC1. By replacing the use of groundwater for irrigation with recycled water will work toward increasing the water supply available for the community during drought times. It is not yet clear to what extent that groundwater for irrigation may be replaced with recycled water, therefore this action is considered supportive at this time and not quantified.

Action WC1-8: Seek additional grant funding to expand the Golf Course Conservation program with a goal to remove/replace an additional 115,000 square feet of turf by 2030. (Supportive)

CVWD has previously removed and replaced turf using grant funding under the Golf Course Conservation Program. GHG emissions reduction associated with implementation of Action WC1-8 are based on the amount of water saved due to turf conversion and the associated reduction in energy needed for supplying that amount of water. However, because this program is dependent on grant funding, until funding is received CVWD will not be able to conduct further turf conversions. Therefore, this action is currently not considered quantifiable. With receipt of funding the impact of turf conversion on GHG emission reductions will be quantified.

Action WC1-9: Continue to implement and expand on successful water conservation rebate programs (e.g., Water audits program for large water users, Residential smart controller rebate program, Commercial irrigation upgrade program, Commercial landscape rebate program, Residential landscape conversion rebate program, Commercial pre-rinse nozzle rebate program, Commercial water broom rebate program, Residential hot water recirculating pump rebate program, Commercial water efficient toilet rebate program, Residential ultra-low flush toilet replacement rebate program, Residential high efficiency washing machine rebate program) in alignment with the current Statewide water conservation goals. (Supportive)

This action is considered supportive of the Measure WC1. Continued implementation of effective water reduction programs through rebates will maintain lower water uses and benefit from the additional educational programs that will be implemented through other actions in this measure. New statewide water conservation goals are currently in development. Once established, CVWD will update the rebate program and the associated per capita water reduction goals in alignment with the statewide goals at which point this action will be quantifiable.

Action WC1-10: Develop and adopt a schedule for installation of water meters in existing buildings and irrigation zones to establish a water consumption baseline at CVWD owned

PROPERTIES WITH THE FACILITIES GROUP. REDUCE CVWD WATER CONSUMPTION PER CAPITA AT FACILITIES IN ALIGNMENT WITH THE CURRENT STATEWIDE GOALS. (SUPPORTIVE)

This action builds on Actions WC1-4 and WC1-5. By installing water meters at existing CVWD facilities and irrigation zones, CVWD can better understand their current water uses and establish goals for operational reductions. This action show CVWD's commitment to serve as an example of water conservation practices that can be employed. New statewide water conservation goals are currently in development. Once established, CVWD will develop water consumption reduction goals in alignment with the statewide goals at which point this action will be quantifiable.

ACTION WC1-11: INVESTIGATE NEW ADVANCE TECHNOLOGY SYSTEMS TO INCREASE DISTRICT'S RECYCLED AND GROUND-WATER RECOVERY SYSTEMS TO MAINTAIN LOCAL WATER SUPPLY (E.G., MID-VALLEY PIPELINE PROJECT). INVEST IN SUCH TECHNOLOGY AS IT BECOMES FEASIBLE AND COST-EFFECTIVE. (SUPPORTIVE)

This action is considered supportive of Measure WC1. Exploring new technologies for increase recycled water capacity and facilitating groundwater recharge and recovery will increase the water supply and improve resiliency of the local water supply.

Results

Table 26 summarizes the actions associated with Measure WC1. The measures are collectively supportive and are aimed at increasing water conservation in CVWD's own operations as well as through building on existing CVWD efforts. Measure WC1 is currently made up of supportive actions and is not quantified as the continued water conservation efforts are dependent on receiving adequate funding and future water conservation goals will not be established until updates to the Water Conservation Act are adopted. GHG emission reductions achieved through implementation of Measure WC1 are anticipated to be quantified in future iterations of the CAAP

Table 26 GHG Emissions Reduction Associated with Measure WC1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
WC1-1 Expand programs which educate customers on water conservation initiatives through workshops and speaking engagements. In coordination with retail water suppliers, host regular workshops and classes on water conservation, including providing information on drought-tolerant landscaping, available rebates for water retrofits, and water efficiency strategies in new buildings. Continue to offer workshops and classes even when drought conditions are not present. Develop outreach materials for water conservation.		Supportive
WC1-2 Continue to work with Agricultural Water Advisory Group to teach farm owners, managers, and irrigators concepts in irrigation water and salinity management as well as promote new technology to help the conservation effort. Apply for grant-funded agricultural rebate programs to assist those in the agriculture industry to reduce water use.		Supportive
WC1-3 Analyze current water use reduction programs to identify which programs have the highest adoption rate and water use reduction impacts. Expand those programs which are found to be most effective.		Supportive

WC1-4 Prepare a formal landscape management plan for CVWD that consolidates and expands upon the goals and policies for landscaping at CVWD property. The Plan should identify whether and where there are resource-consumptive landscapes on CVWD property that can be changed out to more water-conserving, slower growth plants that require less maintenance. Continue to implement potable water conservation strategies in landscape design and maintenance (such as replacing water intensive areas with drought-resilient native plants [Bermuda grass], using low-flow water fixtures, installing sophisticated irrigation software to control water, investing in systems to monitor pipe leakage, and limiting turf development).	Supportive
WC1-5 Require new or redeveloped CVWD developments to be low water use through landscaping with drought tolerant plants, permeable paving, green infrastructure, and incorporating other low-impact development design features to allow for increased infiltration, even in heavy rains.	Supportive
WC1-6 Continue to promote water conservation through xeriscaping through xeriscape demonstration gardens and educational material.	Supportive
WC1-7 Complete and implement Irrigation Master Plan that establishes goals and a timeline for improved water conservation related to irrigation. The Plan should identify the opportunities for replacement of groundwater use for irrigation with recycled water use, including a cost assessment and prioritization of opportunities.	Supportive
WC1-8 Seek additional grant funding to expand the Golf Course Conservation program with a goal to remove/replace an additional 115,000 square feet of turf by 2030.	Supportive
WC1-9 Continue to implement and expand on successful water conservation rebate programs (e.g., Water audits program for large water users, Residential smart controller rebate program, Commercial irrigation upgrade program, Commercial landscape rebate program, Residential landscape conversion rebate program, Commercial pre-rinse nozzle rebate program, Commercial water broom rebate program, Residential hot water recirculating pump rebate program, Commercial water efficient toilet rebate program, Residential ultra-low flush toilet replacement rebate program, Residential high efficiency washing machine rebate program) in alignment with the current Statewide water conservation goals.	Supportive
WC1-10 Develop and adopt a schedule for installation of water meters in existing buildings and irrigation zones to establish a water consumption baseline at CVWD owned properties with the Facilities Group. Reduce CVWD water consumption per capita at facilities in alignment with the current statewide goals.	Supportive
WC1-11 Investigate new advance technology systems to increase District's recycled and ground-water recovery systems to maintain local water supply (e.g., Mid-Valley Pipeline Project). Invest in such technology as it becomes feasible and cost-effective.	Supportive
Total Emissions Reduction Potential	**Supportive**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; ZEV = zero emission vehicle; EV = electric vehicle

Measure CS1: Investigate and Implement Carbon Capture and Sequestration Opportunities

Carbon capture and storage refers to the process of capturing CO_2 emissions from the atmosphere or an industrial process, transporting it, and storing it in deep geological formations, the ocean, or

minerals. Carbon sequestration programs will be an important tool to mitigate some of CVWD's emissions particularly in the development of future GHG reduction strategies). There currently are no regulations or policies requiring CVWD to invest in carbon capture or sequestration. However, as noted in the 2017 California Scoping Plan and California Natural and Working Lands Implementation Plan, the State recognizes the importance that carbon capture and sequestration as strategy that will become increasingly important as we reduce GHG emissions from current operations and sectors. Additionally, there are potential credit generation opportunities based on CARB's "Carbon Capture and Sequestration protocol" adopted in 2018 as well as through other voluntary and federal carbon markets. As such, it is important to plan in advance for potential implementation of sequestration programs that can be used as mitigation.

Although no reductions were quantified for this measure, Measure CS1 looks at future opportunities for negative emissions through carbon capture and storage and/or carbon sequestration on natural and working lands (e.g., rangeland, forests, woodlands, wetlands and coastal areas, grasslands, shrubland, farmland, riparian areas, and urban green space). Direct GHG emissions reduction for this measure are dependent on the carbon capture or sequestration opportunities available and the extent to which these opportunities actively remove CO_2e from the atmosphere. As such, the actions making up Measure CS1 focus on conducting research to understand opportunities and conducting pilot studies to evaluate the benefit.

Methodology and Assumptions

ACTION CS1 – 1: AS PART OF THE CURRENTLY CVWD PUBLISHED LANDSCAPE MANUAL, INCLUDE INFORMATION REGARDING FLORA AND FAUNA CO_2 SEQUESTRATION POTENTIAL TO PROMOTE THE INCORPORATION OF LANDSCAPE PLANTS THAT ARE BOTH LOW WATER AND CO_2 SEQUESTERING. CONSIDER VEGETATIVE OPTIONS WITH HIGHER CO_2 SEQUESTRATION POTENTIAL FOR CVWD FACILITIES LANDSCAPING. (SUPPORTIVE)

By considering vegetative options for both their CO_2 storing potential and low water needs this action supports both Measure WC1 and Measure CS1. Further, incorporation of such information into CVWD's Landscape Manual provides educational information for CVWD customers and may help promote more strategic landscaping within CVWD's service area. However, the impacts of education on customers' behavior is not quantifiable, therefore, the measure is considered supportive.

ACTION CS1 – 2: RESEARCH/EVALUATE THE CARBON SEQUESTRATION POTENTIAL OF THE CVWD CONSTRUCTED HABITAT PROJECT CURRENTLY IN DESIGN. DEVELOP PARTNERSHIPS WITH APPROPRIATE AGENCIES, SUCH AS THE WILDLIFE AGENCY, TO INVESTIGATE POTENTIAL CARBON SEQUESTRATION PROJECTS TO COLLABORATE ON. (SUPPORTIVE)

This action directly supports Measure CS1 by evaluating the carbon sequestration potential of a currently in design habitat project and allows for advanced planning. Since the research and evaluation has not be conducted yet, this action is not yet quantifiable.

Results

Table 27 summarizes the actions associated with Measure CS1 and potential GHG emissions reduction. The measures are collectively supportive and are aimed at increasing carbon sequestration through CVWD habitat projects and promoting strategic landscaping to improve carbon sequestration potential in CVWD's service area.

Table 27 GHG Emissions Reduction Associated with Measure CS1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
CS1-1 As part of the currently CVWD published Landscape Manual, include information regarding flora and fauna CO_2 sequestration potential to promote the incorporation of landscape plants that are both low water and CO_2 sequestering. Consider vegetative options with higher CO_2 sequestration potential for CVWD facilities landscaping.		Supportive
CS1-2 Research/evaluate the carbon sequestration potential of the CVWD Constructed Habitat Project currently in design. Develop partnerships with appropriate agencies, such as the wildlife agency, to investigate potential carbon sequestration projects to collaborate on.		Supportive
Total Emissions Reduction Potential		**Supportive**

Notes: MT CO_2e = metric tons of carbon dioxide equivalent; ZEV = zero emission vehicle; EV = electric vehicle

Measure CR1: Reduce construction-related GHG emissions through construction fleet requirements

Emissions from construction activities are estimated to contribute up to 8 percent of CVWD's overall GHG emission profile. Depending on the approved funding and Capital Investment Projects underway, emissions from construction can vary. Further, CVWD does not have direct control over construction emissions other than the contracting particular fleets for a project. However, by ensuring CVWD is only contracting with construction fleets that are in compliance with current regulations, construction emissions will decrease over time as construction fleets in compliance will have to meet established phase-in schedules for newer engines. State goals to transition to zero-emissions off-road equipment will further reduce emissions as technology improves for such types of equipment.

Methodology and Assumptions

ACTION CR1 – 1: IN ALIGNMENT WITH CALIFORNIA' REGULATION FOR IN-USE OFF-ROAD DIESEL-FUELED FLEETS, ADOPT A POLICY REQUIRING THAT CONSTRUCTION FLEETS AVERAGE FLEET INDEX ARE EQUAL TO OR ARE LESS THAN THE ANNUAL FLEET AVERAGE TARGET AND PRIORITIZES TIER 3 OFF-ROAD DIESEL-POWERED CONSTRUCTION EQUIPMENT GREATER THAN 50 HP WHEN EQUIPMENT IS AVAILABLE AND FEASIBLE. IN ADDITION, PRIORITIZE USE OF CONSTRUCTION EQUIPMENT THAT IS OUTFITTED WITH BACT DEVICES CERTIFIED BY CARB, AND EMISSIONS CONTROL DEVICES USED BY THE CONTRACTOR SHALL ACHIEVE EMISSIONS REDUCTIONS THAT ARE NO LESS THAN WHAT COULD BE ACHIEVED BY A LEVEL 3 DIESEL EMISSIONS CONTROL STRATEGY FOR A SIMILAR-SIZED ENGINE AS DEFINED BY CARB REGULATIONS BY 2023. (SUPPORTIVE)

Under Action CR1-1, CVWD would adopt a policy that is in alignment with state guidelines regarding emissions from construction where construction fleets that CVWD contracts with will be required to comply with the Off-Road Diesel Regulation. The Off-Road Diesel Regulation restricts adding off-road equipment with less than a Tier 3 engine to the fleet after 2023 and requires fleets to reduce their emissions by retiring, replacing, or repowering older engines, or installing Verified Diesel Emission Control Strategies (VDECS) to achieve the fleet average target. Additionally, fleets must meet average emission level comparable to current diesel engine emission standards by 2028.With

EO N-75-20, technology for off-road vehicles is anticipated to continue to advance, providing cost-effective options for off-road equipment. This action is considered supportive by construction fleet emissions being mitigated to the extent feasible. Because CVWD does not have operational control over construction contractor's equipment fleet, this action is not considered quantifiable.

Results

Table 28 summarizes the actions associated with Measure CR1 and potential GHG emissions reduction. The action under this measure is considered supportive of Measure CR1 by ensuring that construction fleets contracting with CVWD are compliant with the state regulations and emissions from construction fleets are reduced to the level feasible without placing undue burden on CVWD to find construction contractors with specialized fleet equipment.

Table 28 GHG Emissions Reduction Associated with Measure CR1

Actions	Emission Reductions Potential (MT CO_2e) 2030	Emission Reductions Potential (MT CO_2e) 2045
CR1-1 In alignment with California' Regulation for In-Use Off-Road Diesel-Fueled Fleets, adopt a policy requiring that construction fleets average fleet index are equal to or are less than the annual fleet average target and prioritizes Tier 3 off-road diesel-powered construction equipment greater than 50 hp when equipment is available and feasible. In addition, prioritize use of construction equipment that is outfitted with BACT devices certified by CARB, and emissions control devices used by the contractor shall achieve emissions reductions that are no less than what could be achieved by a Level 3 diesel emissions control strategy for a similar-sized engine as defined by CARB regulations by 2023.		Supportive
Total Emissions Reduction Potential		**Supportive**

3 Conclusion

As the CAAP is not intended to be a "CEQA qualified" GHG Reduction Plan, the targets that CVWD adopts are not binding but represent CVWD's best intentions with respect to GHG emissions reduction efforts. As such, while the measures and actions identified in this CAAP will not fully close the gap between CVWD's forecasted emissions and its GHG emission targets, implementation of the measures lead to significant progress in reducing GHG emissions and provide a foundation for aligning with State goals. Future CAAP updates will build on existing measures herein as well as outline new measures to further close the gap between CVWD's forecasted emissions and its GHG emission targets with increased focus on the ultimate long-term 2045 goal of carbon neutrality.

As the current measures and actions are implemented, CVWD will gain more information, new technologies will emerge, funding opportunities will be identified, and current pilot projects and programs are anticipated to scale up in size to increase the GHG reduction potential. Furthermore, the State is expected to continue to update regulations and provide support once the 2030 target is achieved. To monitor progress over time, CVWD will conduct annual implementation monitoring of the GHG emission reduction measures and report on progress. CVWD will also annually update the energy sector data for the GHG inventory, with an evaluation of other sectors every three years. The process for monitoring and quantifying measure implementation status relies on key target metrics identified for each of the measures and actions. The CAAP implementation metrics will be monitored on an annual basis starting in 2022 while the CAAP's measures and actions will be reevaluated and updated as needed every five years or more frequently.

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Coachella Valley Water District
51501 Tyler St, Coachella, CA 92236
(760) 398-2651
https://www.cvwd.org/



CV Water Counts

Water COUNTS

ABOUT US SAVE LEARN PLAY NEWS EVENTS



The CV Water Counts group is a nonpro t group that was formed to focus on water conservation, through awareness and education to Coachella Valley residents, businesses, and government. It is

Shared Water Conservation Goals: the Coachella Valley Regional Water Management Group

For decades, the valley's six public agencies have been working together and, in 2008, they formed the Coachella Valley Regional Water Management Group to:

- reduce water demand
- increase our region's water supply
- improve regional water quality
- serve as stewards of our shared water resource
- improve efficiency and flexibility.

- created an Integrated Regional Water Management Plan
- secured nearly $18 million in grant funding
- funded water quality projects throughout the region
- developed – and paid for – conservation programs, rebates, and incentives for residents
- launched a comprehensive conservation outreach effort.

Research Tells Us Valley Residents View Water Conservation as Important

As part of the water agencies' collaborative effort, research was conducted within the Coachella Valley for the purpose of identifying attitudes and opinions about water, water conservation and water conservation efforts of the local water agencies during the drought. A total of 400 surveys were collected. The survey indicated that water and drought were top-of-mind issues, surpassing even public safety and the economy. Click **here** for more information.

Water COUNTS

ABOUT US SAVE LEARN PLAY NEWS EVENTS

CAREERS

Joining Together To Help Those In Need: the Help2Others Assistance Program



In addition, CV Water Counts and United Way of the Desert have teamed up to offer the Help2Others Assistance Program. The program helps eligible residential customers avoid water service shut-off due to non-payment amounts owed to their water department. Agencies offer between $50 – $100 in credits – the amount and application varies by agency. For more information, visit Help2Others Program.

The Coachella Valley's six water agencies

WATER DISTRICT · INDIO water authority · COACHELLA WATER AUTHORITY & SANITARY DISTRICT SERVICE. VALUE. QUALITY. · Myoma Dunes Water Co. · DESERT WATER · MSWD Mission Springs Water District

If you're not sure who provides your water service, learn more here.

Your water agency needs your help to meet our Valley's conservation goals, to ensure that future generations of

Water COUNTS

really add up. Explore our website to learn how you can save, learn, and play – to make Every Drop Count!



Water COUNTS

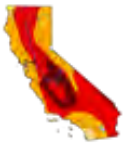
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Conservation



Rebates

Apply for a rebate to increase water-use efficiency in your yard or indoors. Landscape rebates increased from $2 per square foot to $3.



Drought Updates

Customers are encouraged to use water efficiently at all times. Learn more about local actions and conditions.



Report Water Waste

Our staff will investigate every report and provide technical assistance, as needed. Thank you for helping Coachella Valley residents reduce water waste.



Ask CVWD Video Series

In the Ask CVWD series, conservation experts explain ways to reduce water waste, check your meter, program your smart controller, apply for rebates, and check for leaks.

Watering Guide



HOAs & Businesses

Easily search information for home owners associations and businesses.



Colorado River Water Conservation Program



Conservation Links

Links to water conservation resources, including a Desert-Friendly Plants searchable database of more than 330 plants and 800 photos.



Professional Landscapers

CVWD offers a variety of tools to help landscapers improve outdoor water efficiency for their customers.



Lush & Efficient Revised Edition (PDF)

Select Language



We've provided a table showing the approximate amount of water different types of landscaping typically need each month. Individual watering times may vary due to soil and other conditions.



Conservation Tips for Residents

This page features a watering guide, how to videos, water-efficiency tips, fact sheets and much more.



Seminars, Workshops & Classes

CVWD offers water conservation seminars for residents interested in desert horticulture and water-smart landscaping.

Desert gardens can be lush and efficient. Contrary to the image of a desert landscape consisting only of cacti, boulders and gravel, many native and introduced dry-climate trees, shrubs, vines, ground covers and perennials have lush foliage, distinctive forms and showy flowers.



Weather & ET

Find detailed weather forecasts and ET information.



Overseeding

Customers are encouraged not to overseed to avoid paying higher water rates. If you choose to overseed, please follow our Overseeding Without Wasting Guidelines.

Government Websites by CivicPlus®

Select Language

Conservation Tips for Residents



Ask CVWD How To Videos

In the Ask CVWD series, conservation experts explain ways to reduce water waste, check your meter, program your smart controller, apply for rebates, and check for leaks.



Prototype Front Yards

Learn more about water-efficient prototype front yards.



Residential Landscape Tips

Reduce your water use with these 24 water wise tips.



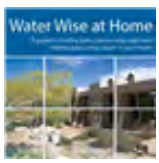
Watering Guide

We've provided a table showing the approximate amount of water different types of landscaping typically need each month. Individual watering times may vary due to soil and other conditions.



Conservation Tips & Fact Sheets

Join our efforts to save our water with these free resources and tools.



Conservation Publications

Download a guide to finding leaks inside and outside your home. Or view our Lush & Efficient Desert-Friendly landscaping book.



Outdoor Water Budget Calculation Equation

Learn how outdoor water budgets are calculated.



Identifying High Consumption

Resources on this site include locating water leaks, tips for reducing water consumption, and reading the monthly bill.

Select Language

Seminars, Workshops & Classes



Residential

These free workshops are designed for home gardeners who want to learn more about water-efficient irrigation, desert horticulture and how to better manage their water use.



Professional Landscaper Certification Course

CVWD offers an online Landscaper Certification Class through College of the Desert. This course is available in English and Spanish.



Educator Workshops

CVWD teachers organize and conduct Project WET workshops to groups of 10 or more educators wanting to learn about how to bring water education into their classrooms while meeting Common Core and the Next Generation Science Standards (NGSS).

Government Websites by CivicPlus®

Select Language

Colorado River Water Conservation Program



The Colorado River Basin has been in historic drought conditions since the early 2000s. Currently, the combined storage in Lake Powell and Lake Mead are at their lowest levels (below 35%) since Lake Powell initially began filling in the 1960s. CVWD has been actively discussing with other Basin States to help mitigate the impacts of the historical dry conditions.

CVWD is soliciting interest for a voluntary, temporary, and compensated water conservation program for canal water users that can demonstrate a reduction in Colorado River water use for 2022 and 2023. CVWD will administer the program with funding provided by external sources. Participants will be incentivized $200/af (net) based on savings against their historical water use over the most recent 5-year period. As an example, water savings could be achieved through the removal of agricultural land from production or switching to less water intensive crops. **Substitution of groundwater will not be allowed.**

CVWD held a public workshop on May 17 and addressed questions and comments that potential participants had about the program. More information about the program can be found on the program fact sheet.

Colorado River Water Conservation Program Recent Updates

During their June 28, 2022 Board meeting, CVWD's Board of Directors took an important step to help mitigate the situation on the Colorado River by approving the Colorado River Water Conservation Program. Water conserved through this program will be classified as system water and will be left in the Colorado River system to help prevent elevations in Lake Mead and Lake Powell from reaching critically low levels.

Select Language

Canal customers interested in the program are requested to fill out an application and a landowner consent form (for those who are leasing land). Once the application is submitted, it will be reviewed by CVWD staff and funding partners to determine eligibility. Customers approved to participate in the program will be required to sign an agreement with CVWD. For more information about the Rules and Regulations of the program, please click here.

Customers may submit an application and a landowner consent form (if applicable) by one of the following methods:

- Fill out the application and consent form online and submit electronically OR
- Download the application and consent form, complete the forms off-line, and e-mail at ConserveCRW@cvwd.org.

Please feel free to contact us at ConserveCRW@cvwd.org if you have additional questions about the program.

Government Websites by CivicPlus®

Select Language

CVRWMG Coordination - Regional Urban Water Management Plan and Water Shortage Contingency Plans



Coachella Valley Urban Water Management Plan

See the final 2020 Coachella Valley Regional Urban Water Management Plan < http://www.cvrwmg.org/wp-content/uploads/2021/08/Final-Coachella-Valley-RUWMP.pdf> .

See Key Documents < http://www.cvrwmg.org/uwmp/key-documents/> for a list of UWMP related documents.

California's Urban Water Management Planning Act (Act) requires urban water suppliers in the state to adopt a Regional Urban Water Management Plan (UWMP) every five years. The UWMP includes:

- A forecast of a supplier's water demands and available supplies for the next 20 years
- An assessment of the reliability of those supplies during drought.
- The programs a water supplier has in place to encourage water use efficiency
- Actions that suppliers could take to reduce demands in times of constrained supply

For the 2020 planning cycle, six agencies in the Coachella Valley collaborated to develop a Regional Coachella Valley UWMP (CV UWMP). The CV UWMP meets each agency's obligations under the Act, and demonstrates a collaborative approach to managing regional water resources while encouraging water use efficiency.

The final documents were adopted by each agency's governing board in June 2021 and then submitted to the state on July 1, 2021.

CV UWMP Participants

< https://www.coachella.org/>	< http://www.cvwd.org/>	< http://www.dwa.org/>	< https://www.indio.org/your_government/water/ >	< http://www.mswd.org/>	http://www.er.com/D
City of Coachella/ Coachella Water	Coachella Valley Water	Desert Water	City of Indio/Indio Water Authority <	Mission Springs Water	Myoma D Water (

Authority < http://www.coachella.org/> | District < http://www.cvwd.org/> | Agency < http://www.dwa.org/> | https://www.indio.org/your_government/water/ > | District < http://www.mswd.org/> | http://wwer.com/D

Agencies engaged various governments, tribes, community groups and the public through a series of public workshops. Several comments were received and feedback informed the plan.

Comment Response Matrix < http://www.cvrwmg.org/wp-content/uploads/2021/08/RUWMP_comment-matrix_080221.pdf>

If you have any questions about water planning, you can reach out to one of the representatives below.

Agency	Address	Contact	Email
Coachella Valley Water District	P.O. Box 1058 Coachella, CA 92236	Zoe Rodriguez del Rey, Water Resources Manager	ZRodriguezdelRey@cvwd.org
Coachella Water Authority (City of Coachella)	1515 Sixth St. Coachella, CA 92236	Castulo Estrada, Utilities Manager	cestrada@coachella.org
Desert Water Agency	1200 S Gene Autry Trail Palm Springs, CA 92264	Ashley Metzger, Outreach & Conservation Manager	ametzger@dwa.org
Indio Water Authority (City of Indio)	83101 Avenue 45 Indio, CA 92201	Reymundo Trejo, Assistant General Manager	rtrejo@indio.org
Mission Springs Water District	66575 Second Street Desert Hot Springs, CA 92240	Brian Macy, Assistant General Manager	bmacy@mswd.org
Myoma Dunes Mutual Water Company	79-050 Avenue 42 Bermuda Dunes, CA 92203	Mark Meeler, General Manager	markmeeler@myomawater.com

Public Engagement Workshops

Date & Time	Name	Location	Meeting Description
Monday, December 14, 2020 2:00 pm – 4:00 pm	Workshop #1: Community Values and Plan Overview	Via Zoom	In this educational and interactive workshop, attendees weighed in on things like drought response measures and Plan outcomes that are most important to them. To set the stage, the project team gave an overview of local water supplies and the Plan (e.g. Plan requirements, Plan contents, etc.). The workshop incorporate interactive activities and open discussion. The input collected during this workshop will be summarized and used to inform the final Plan. Download the workshop slides. < http://www.cvrwmg.org/?mdocs-file=1693> Watch the workshop recording, part 1. < https://vimeo.com/491276792> Watch the workshop recording, part 2. < https://vimeo.com/491292766>
March 31, 2021 2:00 pm – 4:00 pm	Workshop #2: Preview of the Future Water Supply Plan	Via Zoom	In this educational workshop, the project team presented a summary of the community input provided to date, as well as a grounding in key considerations that go into water shortage planning. Next, participants broke into small groups to provide valuable perspective that will be used to inform future water shortage and drought responses. Watch the workshop recording. < https://vimeo.com/531894938> Download the workshop slides. < http://www.cvrwmg.org/?mdocs-file=1753>

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Up ↑



3 Issues and Needs

This chapter outlines the major water-related issues and need of the Coachella Valley Integrated Regional Water Management (IRWM) Region, and demonstrates that it based on sound technical information, analyses, and methods as directed in the ***Technical Analysis Standard****.*

3.1 Coachella Valley Issues and Needs

To clearly establish the Coachella Valley IRWM/Stormwater Resource (SWR) Plan Objectives (see *Chapter 6 Objectives*), the following section outlines the issues, needs, and conflicts related to water management in the Coachella Valley. The information provided on this chapter is based on the information about the Coachella Valley IRWM Region's (Region) water resources, which are available in *Chapter 2 Region Description*.

The issues and needs included in the following sections are listed below.

1. Water Demand
2. Water Supply
   - Groundwater
   - Imported Water
   - Surface Water
   - Water Conservation
3. Recycled Water
4. Stormwater
5. Water Quality
   - Groundwater
   - Imported Water
   - Surface Water
   - Wastewater/Recycled Water
   - Stormwater
6. Flood Management
7. Natural Resources
8. Disadvantaged Communities
9. Tribal Nations

It is important to recognize that climate change has the potential to impact these issues and needs in different ways. Climate change is extensively discussed in Section 3.2 and in *Chapter 6 Objectives* in this IRWM/SWR Plan.

3.1.1 Water Demand

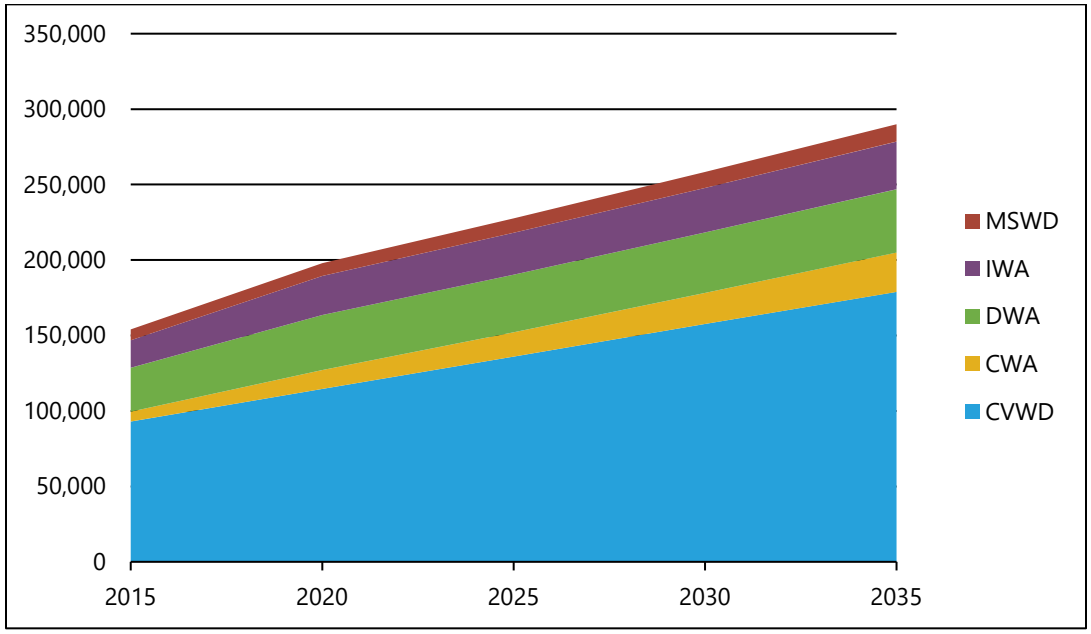
The total potable water (water that meets drinking water standards) demand for Coachella Valley Regional Water Management Group (CVRWMG) agencies is projected to increase by approximately 50% from 197,911 acre-feet per year (AFY) in 2020 to 289,890 AFY in 2035. A breakdown of urban water demand by agency as reported in the agencies' 2010 Urban Water Management Plans (UWMPs) is shown in **Figure 3-1** (see also *Chapter 2 Region Description,* **Table 2-13**: Total CVRWMG Agency Projected Demands).

Water agencies recently prepared 2015 updates to their UWMPs, which took the recent recession, associated changes in local development patterns, and water conservation mandates into account. Because of the economic recession since 2007, the rate of growth has moderated in the near term. However, overall growth in Coachella Valley is expected to increase through 2045, as the effect of the

recession on growth is expected to attenuate over the long-term planning horizon. Future changes in land uses, including future conversions of agricultural or vacant lands to urban land uses, development on Tribal lands (particularly in eastern Coachella Valley), and annexation of lands by cities or expansion of their spheres of influences affect the amount of growth (CVWD 2012; CVWD 2016a; CVWD et al. 2013).

As described in *Section 2.4.2 Water Demand* and shown in **Figure 3-1**, water demands are projected to nearly double from 2015 to 2035. This increase in demand is largely driven by projected population growth in the Coachella Valley. **Figure 3-2** provides a projection of water demand for different uses for the Coachella Valley from the 2010 Coachella Valley Water Management Plan (WMP) and Mission Creek-Garnet Hill WMP. Due to projected residential growth in the Coachella Valley (discussed in *Chapter 2 Region Description*), urban demands are expected to increase at a faster rate than agricultural demands.

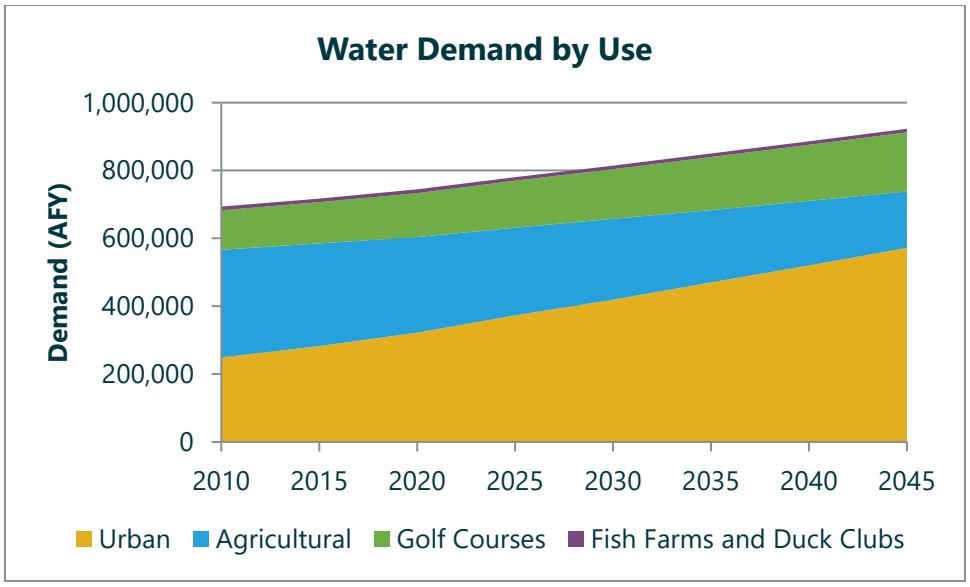
Figure 3-1: Total Projected CVRWMG Agency Potable Water Demand with Conservation[1]



1. Projections are for a normal water year and include water losses.

Sources: CVWD 2016a; DWA 2016; MSWD 2016; CWA 2016; IWA 2016

Figure 3-2: Total Water Demand Projections for Coachella Valley IRWM Region



Source: CVWD 2012; CVWD et al. 2013

Note: Duck Clubs are private clubs for duck hunters. Fish farms and duck clubs are defined as recreational non-potable water uses in the CVWD UWMP (CVWD 2016a).

Increasing Water Demands

Population growth and changes in land use correspond to an increase in water demand and pressure on the existing water supply sources, including the groundwater basins (CVWD 2012; CVWD 2016a; CVWD et al. 2013; IWA 2016; MSWD 2016; DWA 2016; CWA 2016). As shown in **Table 2-11**, the total water demand projected in the plan area for the year 2040 is 886,293 AFY (CVWD 2012; CVWD et al. 2013; CVWD 2016a; IWA 2016; DWA 2016; CWA 2016; MSWD 2016).

Water supply sources in the Coachella Valley include groundwater, imported water, surface water, and recycled water; although groundwater is the Region's primary water resource (CVWD 2012; CVWD 2016a; CVWD et al. 2013; IWA 2016; MSWD 2016; DWA 2016; CWA 2016). Due to the role of groundwater as the Region's primary water supply source, increased water demand would have the greatest impact on groundwater supply. Increased demand could lead to groundwater overdraft if those demands are not met with available local water supply sources such as recycled water.

3.1.2 Water Supply

Coachella Valley water supplies are primarily obtained from: imported water supplied through the Coachella Canal and the Colorado River Aqueduct, as well as groundwater pumped from the Coachella Valley Groundwater Basin. However, concerns over Coachella Valley's future water supplies has increased due to a combination of drought, reductions in imported water deliveries, over pumping of groundwater, and seasonal variation in surface water. These concerns are discussed further below.

Groundwater

The Coachella Valley Groundwater Basin encompasses much of the Coachella Valley floor. Geologic faults and structures divide the basin into five subbasins: Whitewater River (Indio), Garnet Hill, Mission Creek, Desert Hot Springs, and West Salton Sea. The Whitewater River Subbasin, the largest of the five subbasins, has a storage capacity of approximately 30 million acre-feet (CVWD 2012). The Mission Creek Subbasin has an estimated total storage capacity on the order of 2.6 million acre-feet. The Garnet Hill Subbasin has an estimated total storage capacity on the order of 1.0 million acre-feet (CVWD et al. 2013).

A confining layer, or aquitard, extends from near La Quinta to the Salton Sea, and conceptually divides the area into four main hydrogeologic units: the semi-perched aquifer, the upper aquifer, the aquitard, and the lower aquifer (refer to **Figure 3-5** below). Capping the upper aquifer at the surface are tight clays and silts with minor amounts of sands, within which semi-perched groundwater occurs (CVWD 2012). The semi-perched aquifer is extensive and generally retards the deep percolation of surface runoff and applied irrigation water. The 100 to 200 foot-thick aquitard, located below the upper aquifer, restricts groundwater flow between the upper and lower aquifers (IWA 2008).

Groundwater Overdraft

Groundwater supply consists of a combination of natural inflow and returns from groundwater and imported water use. Despite the large amount of artificial groundwater recharge, the local groundwater basin has periodically been in overdraft throughout recent decades. The loss in groundwater storage in 2009 was lower than historical loss due to increased delivery of the Region's State Water Project (SWP) allocations that are provided via exchange with the Metropolitan Water District of Southern California (MWD) at Whitewater River Groundwater Replenishment Facility (GRF) and increased Canal water recharge at the Thomas E. Levy GRF in the eastern Coachella Valley beginning in 2009. For example, the 2013 Coachella Valley Water District (CVWD) Engineer's Report on Water Supply and Replenishment Assessments for Mission Creek, East Whitewater River, and West Whitewater River all noted that groundwater monitoring wells showed water level increases, indicating reductions in overdraft conditions, and reduced rates of overdraft.

As reported in the 2010 Coachella Valley WMP, for the Whitewater River and Garnet Hill groundwater basins, the long-term average of natural inflow is about 57,000 AFY and varies from about 8,000 AFY in very dry years to over 200,000 AFY in extremely wet years. From 2000 to 2009, natural inflows were below normal averaging about 40,000 AFY. Returns from use vary with water demands. From 2000 to 2009, returns from use are estimated to average about 240,000 AFY. During this same period, about 51,000 AFY of imported water was recharged in the basin. Total inflows are estimated to be about 331,000 AFY (CVWD 2012). Outflows from the basin consist of pumping, flows to the agricultural drainage system, evapotranspiration by native vegetation and subsurface outflow to the Salton Sea. For the 2000-2009 period, groundwater pumping averaged about 389,000 AFY. Drain flows are estimated be about 48,000 AFY, while evapotranspiration and subsurface outflow averaged about 4,000 AFY. Total basin outflows for this period averaged 441,000 AFY (CVWD 2012). This equals basin pumping in excess of total recharge by 110,000 AFY.

Regional water levels, including those in the Mission Creek and Garnet Hill Subbasins, have been declining since the early 1950s due to scarce annual precipitation and groundwater extractions. Groundwater level data indicate that since 1952, water levels have declined at a rate of 0.5 to 1.5 feet per year (CVWD et al. 2013). Continued overdraft without additional recharge would have significant consequences for the Coachella Valley, including:



- Land subsidence and associated permanent loss of groundwater storage capacity in some areas, along with resultant potential for ground fissures and damage to buildings, sidewalks, streets, wells, and buried pipelines;
- Increased costs to pump water and deepen wells; and
- Water quality degradation, which includes increased salinity from Salton Sea intrusion and perched water intrusion.

Any reductions in other water supplies (e.g., imported water allocations) resulting from droughts, climate change, or litigation could further erode groundwater supply availability, as there is insufficient water supply to meet projected demands without additional water supply sources.

To eliminate long-term overdraft conditions, groundwater must be managed carefully in combination with other water management strategies. Groundwater pumping needs to be brought into balance through other means including conservation, acquisition of additional water supplies, conjunctive use programs to maximize supply reliability, source substitution programs (e.g., recycled water or desalinated water), and groundwater recharge programs. Failure to achieve this balance could lead to continued water level declines, water quality degradation, land subsidence (which can result in loss of groundwater storage and impacts on infrastructure), and increased pumping costs (CVWD 2012; CVWD 2016a; IWA 2008; CVWD et al. 2013; IWA 2016; MSWD 2016; DWA 2016; CWA 2016). While reversal of overdraft would eliminate the above risks, increasing water levels could also result in other types of risks, including shallow groundwater, liquefaction, and artesian flow. The challenge in groundwater management is to achieve an appropriate balance between the resulting higher groundwater levels and the risks and benefits associated with those levels (CVWD 2012).

Agricultural Drainage

Within the eastern Coachella Valley, agricultural tile drains were installed to drain shallow groundwater. Most of the drains empty into the Coachella Valley Stormwater Channel (CVSC), while a few smaller open channel drains convey flows directly to the Salton Sea. Agricultural drain flows are needed to export salt from the Region and to maintain habitat in the CVSC, agricultural drains, and the Salton Sea. Water levels in the underlying groundwater aquifers and the quantity of applied irrigation water determine the amount of flow in the agricultural drains. Additionally, groundwater use has the potential to impact agricultural drain flows as declining groundwater levels may result in negative pressure, meaning that groundwater would flow down into the basin rather than up into the agricultural drain system. Any change in the amount of agricultural drain flows can have consequences to biological resources in the CVSC and Salton Sea (CVWD 2012).

Land Subsidence

Groundwater withdrawal is the most likely cause of land subsidence in the Coachella Valley. Subsidence can lead to visible cracks, fissures, or surface depressions, damage to structures (e.g., canals, utilities, roads, and buildings), damage and loss in effectiveness of the subsurface agricultural drainage system, disruption of surface drainage and irrigation systems, and loss of vertical elevation. Groundwater pumping has caused groundwater levels to decrease more than 60 feet in portions of the eastern Coachella Valley from La Quinta to the Salton Sea, and raised significant concern about water quality degradation and land subsidence in this area. Recently, however, reduced pumping in the eastern Coachella Valley along with recharge at the Thomas E. Levy Facility has resulted in a return to artesian flow in the vicinity of Mecca. Groundwater

monitoring results indicated that a pumping hole created by an aquaculture facility has recovered since the facility reduced pumping from about 8,000 AFY to 2,000 AFY.

Groundwater levels in the western Coachella Valley have also decreased substantially, except in the areas near the Whitewater Spreading Facility where artificial recharge has successfully raised water levels. **Figure 3-3** shows areas within the Region where land subsidence studies have been conducted by the U.S. Geological Survey. These studies have inferred land subsidence in the areas marked in pink.

In 1996, the United States Geological Survey (USGS), in cooperation with CVWD, established a geodetic network of monuments to monitor vertical changes in land surface in the eastern Coachella Valley. Results of the monitoring program, published in a 2007 report, identified at least four areas in the Coachella Valley that had experienced land surface elevation changes, indicating that land subsidence occurred in three of the areas (Palm Desert, Indian Wells and La Quinta) and both subsidence and uplift apparently occurred in one of the areas (Indio-Coachella) between 2003 and 2005. These areas of subsidence coincide with or are near areas where groundwater pumping generally caused groundwater levels to decline. Other local areas in the Coachella Valley also may have deformed, but the size of these areas and the amount of deformation generally are small compared with the Palm Desert, Indian Wells and La Quinta areas. Eight of the fourteen measurement sites for which subsidence rates could be compared show subsidence rates increased by as much as a factor of 10 between 2000 and 2005, compared with subsidence rates prior to 2000 (CVWD 2012; USGS 2007; IWA 2008).

Ultimately, subsidence could limit the quantity of pumping in the Coachella Valley; however, as indicated in the previous section, increased groundwater levels indicate reductions in overdraft conditions, and are likely to reduce future land subsidence.



Land Subsidence Study Areas

Figure 3-3

Legend

- Recharge
- Division between Western and Eastern Coachella Valley
- Colorado River Aqueduct
- Coachella and All American
- Whitewater River Stormwater Channel
- Coachella Valley Stormwater Channel
- Highways
- Water Bodies
- Colorado River Funding
- IRWM / SWR Planning
- City Boundaries
- County Lines
- USGS Study
- SubsidenceTestArea
- Inferred Land Subsidence

0 1.75 3.5 7 10.5 14 Miles

N

Map Created: June 2018

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: USGS Detection and Management of Land Subsidence in Coachella Valley, 2003-2005; Desert Water Agency GPS Control Survey April 2008 and Facilities Benchmarks, 1962-1994**

Figure Exported: 7/11/2018 By: gvalenzuela Using: \\woodardcurran.net\shared\Projects\RMC\SD\0574 - CVWD\0574-002 Coachella IRWM Plan Update\03_GIS\2018 IRWM-SWR Plan Update\GIS\MXDs\Fig 3-3 Land Subsidence Study Areas.mxd

Semi-Perched Aquifer

If the amount of overdraft reduction is greater than the reduction in return flows, increased water levels could occur in the semi-perched aquifer. High groundwater levels in shallow perched or semi-perched aquifers can lead to waterlogging of soils which can lead to septic system failures, structural flooding (seepage into subterranean parking, etc.), utilities damage (flooded vaults, sewer infiltration, etc.) and saturated root zones resulting in adverse effects on agricultural production and landscaping. Currently, extensive agricultural irrigation in the eastern Coachella Valley contributes a significant amount of return flow to the semi-perched aquifer maintaining the shallow groundwater levels. Continued use of the drainage system is expected to be necessary to maintain water levels and to export salt resulting from irrigation (CVWD 2012).

Liquefaction

As overdraft conditions improve in the eastern Coachella Valley and groundwater levels rise, the potential for liquefaction increases, as well as the need for adequate drainage and proper foundation design for structures within identified liquefaction zones (CVRWMG Planning Group Meeting – May 19, 2010). Liquefaction is a physical process by which sediments below the water table temporarily lose strength and behave as a liquid rather than a solid. In the liquefied condition, soil may deform enough to cause damage to buildings and other structures. Seismic shaking is the most common cause of liquefaction. As indicated in the Coachella Valley WMP, liquefaction occurs in well-sorted (similar sized) sands and silts in areas with high groundwater levels. Liquefaction has been most abundant in areas where groundwater occurs within 30 feet of the ground surface and liquefaction hazards have been noted for the area from Indio southeast to the Salton Sea. The California Department of Water Resources (DWR) indicated a liquefaction hazard exists for the majority of the eastern Coachella Valley floor because of perched groundwater and presence of appropriate soils, although there is no surface indication of any liquefaction occurring in the past (CVWD 2012).

Artesian Conditions

As overdraft conditions are reduced, groundwater levels in the deep aquifers are expected to return to conditions similar to those of 1970s and 1980s, when wells exhibited positive pressure that led to artesian conditions. While flowing artesian conditions can reduce the amount of pumping energy required to extract groundwater, such conditions can also lead to loss of water from improperly controlled wells, property damage if water is not routed to drainage channels, vector control issues, and leakage from the deeper aquifers into the shallow aquifers through wells that are perforated in both zones (which can potentially lead to water quality degradation). Recent observations indicate that artesian conditions have returned to portions of the eastern Coachella Valley due to changed pumping patterns, including a significant pumping reduction by aquaculture operations south of Mecca, and increased recharge from operation of the Thomas E. Levy GRF and other recharge facilities (CVWD 2012; CVWD 2013a).

Garnet Hill Underflow

The Garnet Hill Subbasin is upgradient of Whitewater River Subbasin and groundwater underflow typically flows from the Garnet Hill Subbasin to the Whitewater River Subbasin. However, high groundwater levels in the Whitewater River Subbasin following large recharge events may limit flow from Garnet Hill Subbasin to the Whitewater River Subbasin or even cause underflow to the Garnet Hill Subbasin. Presently, there is limited groundwater level monitoring data available for the Garnet Hill Subbasin and additional monitoring is needed (CVWD et al. 2013).

Conjunctive Use

With the increased variability and uncertainty of imported water deliveries, conjunctive use could provide groundwater storage opportunities for other water agencies in the State of California. Issues related to this option include the need for recharge facilities to have sufficient capacity to allow capture of surplus water deliveries during future wet periods, the availability of water above and beyond existing customers' demands to recharge, and additional pumping capacity. Under the Advanced Delivery and SWP Exchange Agreements, the mechanism for returning stored water to entities outside the basin is through a reduction in deliveries of the Region's SWP allotments. If stored water is to be returned through reductions in Canal water deliveries, then deliveries for recharge would need to be reduced during the payback period. If recharge reductions are insufficient, then reductions in direct deliveries would need to be offset through increased groundwater pumping (CVWD 2012).

Source Substitution

Source substitution, where an alternate water source is used in the place of pumped groundwater, is important potential water, money, and energy conservation measure associated with groundwater. Alternate sources of water in the Coachella Valley include recycled water, Colorado River water, desalinated agricultural drain water, and SWP allotments delivered via exchange with MWD. Depending on use, these sources may not be treated to potable standards, but are used for irrigation and other non-potable uses, though in some areas, such as the eastern Coachella Valley, urban groundwater users may be converted to treated Colorado River water. Some issues with potential source substitution projects may include regulatory (e.g., ability to meet water quality standards), user resistance, cost, geological and physical limitations, and infrastructure limitations (CVWD 2012).

Costs

Costs related to groundwater issues expressed in the preceding sections could include: reduced groundwater storage capacity; increased power consumption due to increased pumping lifts; repair and replacement of damaged infrastructure; and additional water treatment requirements due to decreases in water quality. The cost of addressing groundwater issues may disproportionately impact economically disadvantaged communities if such costs result in increased water rates or fees.

Imported Water

The Region relies on SWP allotments delivered via exchange with MWD and Colorado River supply via the Coachella Canal (refer to *Chapter 2 Region Description*). However, concern regarding the reliability of imported water supplies has increased due to: reductions in SWP deliveries (potentially less than the Region's designated allocations); drought in the Colorado River Basin and recent litigation that could potentially affect the 2003 Quantification Settlement Agreement (QSA); and increased costs for importing water. As described below, SWP reliability is of greater concern than Colorado River reliability, which in the absence of extreme shortages, is guaranteed full delivery.

SWP Reliability

CVWD and Desert Water Agency (DWA) do not have a direct delivery connection to the SWP and instead receive their deliveries via an exchange agreement with the MWD where MWD takes CVWD and DWA's SWP allocations and in turn delivers and equal amount of Colorado River Water via the MWD Colorado River Water Aqueduct. Per DWA and CVWD's SWP allocation agreements, they have a combined SWP

allotment (Table A Allotment) of 194,100 AFY. Despite the agencies' contractual allotments, each year, DWR determines the amount of water available for delivery to SWP contractors based on hydrology, reservoir storage, the requirements of water rights licenses and permits, water quality, and environmental requirements for protected species in the Sacramento-San Joaquin Delta (Delta). Thus, SWP supplies fluctuate annually. DWR estimates the current average reliability of the SWP to be 60% of Table A Amounts[1], although the reliability of the SWP water has decreased over time. Other factors that could further reduce the SWP reliability include the uncertainty in modeling restrictions associated with biological opinions, risk of levee failure in the Delta, additional pumping restrictions resulting from biological opinions on new species or revisions to existing biological opinions, impacts associated with litigations[2], and climate change impacts. Current efforts in the Delta (e.g., Bay-Delta Conservation Plan) may improve water supply reliability but not necessarily yield; if the Bay Delta Conservation Plan is implemented, then SWP supply reliability could potentially be expected increase to 77% of Table A (CVWD 2012; CVWD et al. 2013; DWA 2009a).

Colorado River Reliability

Although the Coachella Valley's Colorado River supply faces problems that could impact long-term reliability, interim guidelines for Lower Basin shortages and coordinated operations for Lake Powell and Lake Mead were adopted in 2007 that will provide Colorado River recipients a higher degree of reliability. Some potential threats to reliability include the prolonged Colorado River Basin drought, Colorado River shortage sharing agreement, endangered species and habitat protection, the litigation challenging the validity of the QSA[3], and climate change. However, under the interim guidelines it is expected that California would only experience shortages if the total shortage in the Lower Basin exceeds 1.7 million AF. Due to California's Colorado River priority system, all delivery shortages would be borne by MWD, which has a lower priority than CVWD. Consequently, no reduction in CVWD's Colorado River supplies is projected at this time (CVWD 2012). Although recent litigation posed a threat to the stability of the 2003 QSA, a June 4, 2013 ruling by the Superior Court of California upheld the QSA, securing the water deliveries outlined in that document. Thus, current Colorado River allocations to the water agencies for beneficial consumptive use and transfers and exchanges of conserved water to and between water agencies and other parties under the QSA for the 75-year period starting in 2003 are preserved.

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[1] SWP water contractors submit annual requests to the DWR for water allocations and DWR makes an initial SWP Table A allocation for planning purposes, typically in December of each year. Throughout the year, as additional information regarding water availability becomes available to DWR, its allocation/delivery estimates are updated.

[2] In October 2005, the state issued the Delta Smelt Action Plan (DSAP) outlining a 14-point program to identify and understand causes of recent delta smelt population decline and describe actions that should be taken to protect the species. In November 2006, a lawsuit was filed by the California Sportfishing Protection Alliance (CSPA) and other environmental organizations to specifically stop the pumping in the South Delta in an attempt to prevent further decline of the smelt population. In March 2007, a judge ordered DWR to shut down pumping in the South Delta until necessary permits were obtained. In a landmark decision in August 2007, a Federal Judge ordered State and Federal water project managers to reduce the amount of water pumped from the Delta to protect the threatened delta smelt from extinction. The order, which was finalized by the U.S. District Court in December 2007, reduced pumping by 30% from the end of December until June (IWA, 2008).

[3] In 2003, CVWD, IID and MWD successfully completed negotiation of the QSA, which quantifies the Colorado River water allocations of California's agricultural water contractors for the next 75 years and provides for the transfer of water between agencies. Under the QSA, CVWD has a base allotment of 330,000 AFY. In accordance with the QSA, CVWD has entered into water transfer agreements with MWD and IID that increase CVWD supplies by an additional 129,000 AFY by 2026 and remain at that level for the 75 year term of the QSA (CVWD 2011).

Recharge Basin Operation

The timing and the amount of Colorado River water available for recharge is impacted by MWD's water delivery schedule. The amount of available water may be lower than what is required because of water supply reliability and the distribution of imported water recharge between the Whitewater and the Mission Creek Subbasins (CVWD et al. 2013).

With respect to recharge pond operations and maintenance, some water is lost due to evaporation at the artificial recharge sites. Conducting regular maintenance of spreading basins for silt removal will maintain or increase existing infiltration rates and minimize evaporation loss (CVWD et al. 2013).

Surface Water

Surface water from Whitewater River, Snow Creek, Falls Creek and Chino Creek, and smaller creeks and washes is used as water supply for western Coachella Valley urban and golf course customers. In 2009, surface water supplied less than 1% of the total water supply to the Coachella Valley.

Surface Water Reliability

Because surface water supplies are affected by variations in annual precipitation, the annual supply is highly variable. Surface water runoff either percolates in streambeds or is captured in mountain-front debris basins where it recharges the groundwater basin. Since 1993, an average of approximately 60,000 AFY of surface water recharged the Whitewater River Subbasin (CVWD 2012). All surface water that is not captured and used for domestic water supply is accounted for and put to beneficial use by recharging the groundwater aquifer.

Surface water features that contribute to recharge in the Mission Creek Subbasin include Mission Creek, Dry Morongo Wash, and Big Morongo Canyon. Surface water features that contribute to recharge in the Garnet Hill Subbasin includes the Whitewater River. A portion of the imported water released from the Colorado River Aqueduct into the Whitewater River also percolates into the Garnet Hill Subbasin. Recharge in the Garnet Hill Subbasin from the Whitewater River is approximately 7,000 AFY (CVWD et al. 2013). Long Canyon Creek and the Little Morongo Creek provide recharge in the Desert Hot Springs Subbasin, as well as to the Mission Creek Subbasin during times of substantial rainfall. Total recharge varies from approximately 4,900 AFY to 11,800 to 14,300 AFY to both the Mission Creek and Desert Hot Springs Subbasins (CVWD et al. 2013).

Water Conservation

All five water purveyors within the Coachella Valley recognize that water is a limited resource and that water conservation and use efficiency should be actively pursued. Each agency implements a variety of irrigation and/or domestic water conservation measures, including model landscape ordinances, water-efficient irrigation controls, water efficient plumbing, water-wise landscaping programs, conservation outreach and education, conservation pricing of water rates, and water audits (CVWD 2016a; DWA 2016; MSWD 2016; CWA 2016; IWA 2016). **Figure 3-4** provides a screenshot from the CVRWMG's regional water conservation program website www.cvwatercounts.com.

Figure 3-4: CVRWMG Regional Water Conservation Program



Conservation

Conservation efforts are critical to reduce water demand over the long-term, and to reduce the pressure on the groundwater supply. Current water conservation efforts by various agencies have focused on urban use, agricultural irrigation, and golf course irrigation. For example, Coachella Valley cities have adopted the Coachella Valley Landscape Ordinance (2009), conducted water audits, instituted rebate program, implemented tiered pricing, and conducted public information and education programs. Many cities and agencies are signatory to the Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California and are therefore members of the California Urban Water Conservation Council (CUWCC). Members of the CUWCC must comply with all Best Management Practice (BMP) targets outlined in the MOU that have been determined appropriate for the conditions within its service area. Water conservation best management practices (also referred to as demand management measures or DMMs) that are set forth by the CUWCC and implemented by the CVRWMG agencies are provided below in **Table 3-1**. Increased conservation may be required to meet the conditions of Senate Bill SB 7X7, which stipulates urban water purveyors to reduce water use by 20% by the year 2020. However, because of the existing low outdoor use, additional conservation may be limited, but may be extended to water users in the region that are not covered by SB 7x7 (e.g., for private producers) (CVWD 2012; CVWD et al. 2013; MSWD 2016; IWA 2016; DWA 2016; CWA 2016). Water conservation increases the reliability of supplies to the Coachella Valley and is being further pursued through the *Regional Water Conservation Program* funded through IRWM grants (refer to *Chapter 11 Framework for Implementation* for more information).



Table 3-1: Best Management Practices Implemented by CVRWMG Agencies

Best Management Practices		Implementing CVRWMG Agency:				
California Urban Water Conservation Council BMPs		**CVWD**	**CWA**	**DWA**	**IWA**	**MSWD**
1	Water Survey Program for Single-Family and Multi-Family Residential Customers	X	X	X	X	
2	Residential Plumbing Retrofit Program		X	X	X	X
3	System Water Audits, Leak Detection and Repair Program	X	X	X	X	X
4	Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections Program	X	X	X	X	X
5	Large Landscape Conservation Programs and Incentives Program	X	X	X		X
6	High-Efficiency Washing Machine Rebate Program					
7	Public Information Program	X	X	X	X	X
8	School Education Program	X[1]	X	X	X	X
9	Conservation Programs for Commercial, Industrial, and Institutional Accounts Program	X	X	X		
10	Wholesale Agency Programs	N/A	N/A	N/A	N/A	N/A
11	Conservation Pricing Program	X	X		X	X
12	Water Conservation Coordinator Program	X	X	X	X	X
13	Water Waste Prohibition Program	X		X	X	X
14	Residential Ultra-Low-Flush Toilet Replacement Rebate Program	X	X	X		
Other (non-CUWCC) Conservation BMPs Implemented in the Region:						
Main line/equipment replacements to stop leaks		X	X	X	X	X
Have field employees watch for water waste and report water waste issues to customers		X	X	X	X	X
High bill investigations (sending letters to water customers whose water bills or water use spikes)		X	X	X	X	X
Installation of new meters to detect continual flow that is indicative of leaks		X	X	X	X	X
Monitor water levels within the reservoirs through a telemetry system and turn off wells when reservoir levels reach specific levels to prevent over-pumping and possibly overflowing the reservoirs		X	X	X	X	X

Best Management Practices	Implementing CVRWMG Agency:				
California Urban Water Conservation Council BMPs	**CVWD**	**CWA**	**DWA**	**IWA**	**MSWD**
Daily visits to every operating facility to ensure that the system is operating correctly and to inspect the facilities for things such as leaking pipes	X	X	X	X	X
Groundwater replenishment activities	X		X		
Planning efforts that address water conservation such as Urban Water Management Planning, Integrated Regional Water Management Planning, and General Planning	X	X	X	X	X

1. CVWD's School Education Program serves CVWD, CWA, and IWA service areas

Local Economy

Water conservation measures must consider the potential effect on industries that rely on water for irrigation (tourism, golf, agriculture). Water conservation efforts are in place consistent with State law, while not causing significant impacts to water users. While water conservation regulations do not prohibit development of water-dependent enterprises, regulations are in place in various cities in the Coachella Valley to help reduce the water use of such businesses. For example, golf courses are limited in the amount of turf they may install to help reduce their water demands (CVWD 2012).

3.1.3 Recycled Water

Recycled water is needed to meet anticipated future demands and offset existing use of groundwater for non-potable uses, as well as provide for supply redundancy. However, during the summer months, recycled water supplies are not sufficient to meet all current demands; users are required to use their private wells or other water sources to supplement the recycled water supply. A map of existing recycled water facilities is provided in **Figure 2-5** (see *Chapter 2 Region Description*).

Local Supply Development

One of the goals of the State's Recycled Water Policy (2009) includes the increase of recycled water by at least 1 million AFY over the 2002 levels by 2020. Because recycled water is such a valuable resource, it is considered within the Coachella Valley as an additional, local water supply to help eliminate current and future overdraft of the groundwater basins (by helping to meet anticipated future demands and offsetting existing use of groundwater for non-potable uses) and provide for supply redundancy (CVWD 2012; CVWD et al. 2011; CVWD 2016a; DWA 2016; IWA 2016; MSWD 2016; CWA, 2016). Not all agencies in the Coachella Valley currently operate a recycled water system. Where recycled water has not been used, recycled water systems are currently being evaluated (MSWD 2016; IWA 2016; CWA 2016a). The feasibility of a recycled water system is driven by the proximity of suitable users to the recycled water supply source (CVWD et al. 2013). Thus, the challenge is to cost-effectively link recycled water supply to customers; one possibility may be through interagency partnerships (CVRWMG Planning Group meeting - May 19, 2010). Recycled water has been historically used for landscape irrigation at golf courses and other urban landscaped areas in parts of the Coachella Valley. The amount of wastewater available for recycling in the future primarily depends on growth in the Coachella Valley and water quality regulations. According to the Coachella Valley WMP, within the Whitewater River Subbasin, recycled water could

meet as much as 12,000 AFY of non-potable demand in the Coachella Valley by 2045, based on order of magnitude estimates of water demands and wastewater flows (CVWD 2012). Mission Springs Water District (MSWD) is currently in design for a new wastewater treatment plant, the West Valley Water Reclamation Facility, with an initial treatment capacity of 1.5 mgd, within the area of the Mission Creek and Garnet Subbasins. While surface spreading of effluent is currently proposed, MSWD anticipated adding tertiary treatment in a subsequent phase. The projected recycled water use in 2040 is 6,400 AFY (MSWD 2016). As growth in the eastern Coachella Valley continues, there is potential for use of up to 53,000 AFY of recycled water by 2045, though this recycled water use may impact habitat along the CVSC and the Salton Sea by reducing flows (CVWD 2012).

Seasonal Variability

Wastewater flows in the Region peak during winter during high-tourism months. Recycled water demands, however, peak during summer, when the precipitation is low, and heat is high. Agencies are currently using percolation ponds for seasonal groundwater storage; percolation is expected to be reduced as recycled water customer bases develop in the future (CVWD 2012; CVWD et al. 2013).

In the western Coachella Valley, demand for non-potable water typically exceeds the available supply, especially in the summer months. Irrigators using recycled water currently must supplement that supply with local groundwater to meet peak summer demands (CVWD 2012; DWA 2016). In an effort to stabilize the supply and demand, DWA recently built an influent tank reservoir to store water in periods of high supply. Augmentation using other sources of supply would be necessary in the future to address the imbalance of demand and supply.

Costs

Because little reuse of wastewater is occurring in the eastern Coachella Valley, essentially all wastewater produced from the three eastern Coachella Valley wastewater treatment plants is discharged into the CVSC. However, as growth occurs in the eastern Coachella Valley, more wastewater will be generated and require treatment (CVWD 2012). The water agencies face challenges associated with cost-effectively linking recycled water supply to customers (i.e., strategic location of treatment facilities), possibly through inter-agency partnerships in the future.

3.1.4 Stormwater

Riverside County Flood Control and Water Conservation District (RCFCWCD) and CVWD are the Region's flood control districts. They operate and maintain a series of regional flood control facilities throughout the Coachella Valley that ultimately drain to the Salton Sea during major and significant storm events (refer to *Chapter 2 Region Description*). Local cities and the County of Riverside manage localized urban drainage systems that drain to these facilities.

The backbone of this system is the Region's 49-mile Whitewater River Stormwater Channel/Coachella Valley Stormwater Channel (WRSC/CVSC). West of Washington Street, the channel is referred to as the WRSC; east of Washington Street, the channel is referred to as the CVSC. The WRSC follows the natural Whitewater River, and flows in the WRSC are ephemeral, while the CVSC is the channelized portion of the Whitewater River, and generally contains flow year-round east of Dillon Road from agricultural drains, permitted discharges, and stormwater runoff from occasional storm flows.



Local cities and the County convey runoff from major storm events to the WRSC/CVSC. The stormwater channel is designed for the Standard Project Flood of 82,000 cubic feet per second (City of Coachella 2012). Three wastewater treatment plants (Valley Sanitation District (VSD), City of Coachella, and CVWD's WRP-4) also discharge effluent to the CVSC. Flows are then conveyed by the WRSC/CVSC to the Salton Sea.

Stormwater Capture

Stormwater capture has been identified as a potential method to augment local water supplies in the Coachella Valley. Stormwater retention systems located in strategic areas of suitable geology could capture runoff from surrounding mountains within the Whitewater River and Mission Creek Subbasins (CVWD 2012; CVWD et al. 2013; CVWD 2016a). The 2013 Municipal Separate Storm Sewer System (MS4) permit requires builders of new developments to include stormwater capture and recharge infrastructure (Regional Board 2013). Water agencies will need to coordinate with the local cities and the County of Riverside to maximize use of stormwater capture and recharge infrastructure related to development, because management of development requirements is not under the purview of the water agencies (CVWD et al. 2013). While the 2013 MS4 permit requirement solidifies this strategy for runoff management, stormwater capture and beneficial use is a long-standing strategy in the Coachella Valley, where MS4 permittees have required stormwater onsite retention (detention and infiltration) through municipal ordinances years before the 2013 MS4 permit.

3.1.5 Water Quality

This section addresses key issues concerning Coachella Valley's water quality.

Water Supply

Groundwater

Groundwater supply from the Coachella Valley Groundwater Basin is generally of high quality. Disinfection is not required but is generally provided as a precautionary measure before distribution of water for potable uses. For a summary of recent groundwater quality concentrations, see **Table 2-19** in *Chapter 2 Region Description*. Current and emerging groundwater quality issues in the Coachella Valley include salinity, arsenic, nitrate, fluoride, ammonium, perchlorate, chromium-6, and uranium.

Although groundwater quality is generally considered high in the Region, groundwater quality is a concern in isolated areas of the Region. In the eastern Coachella Valley, groundwater overdraft has reduced groundwater flow into the agricultural drains, which has changed groundwater pressure conditions (refer to *Section 3.1.2 Water Supply* for more information). This change in pressure, if it results in negative pressure that directs water down into the groundwater basin, may result in water that is high in total dissolved solids (TDS or salts) migrating from the semi-perched zone downward to the Upper aquifer. **Figure 3-5** illustrates the structure of the local groundwater aquifer, including the semi-perched zone. Under these conditions, water in the Upper aquifer, which is generally of lower quality, may also migrate to the Lower aquifer, particularly along the margins of the basin, where the aquitard separating the two zones is thin or absent. The net result of such pressure changes would potentially be a decline in the water quality of the Lower aquifer in the eastern Coachella Valley (CVWD 2002).

In the eastern Coachella Valley, there is also concern about elevated levels of natural constituents in the groundwater. Naturally occurring substances such as uranium, arsenic, and fluoride have been detected, and are likely due to natural geologic conditions. As described in *Chapter 2 Region Description, Section 2.5.1 Groundwater Quality*, representatives of Disadvantaged Community (DAC) and tribal organizations report that groundwater supplies for some mobile home park communities within the eastern Coachella Valley have arsenic concentrations that exceed the regulatory standard maximum contaminant level (MCL) of 10 parts per million (ppm). Nitrates are a concern throughout the Coachella Valley with respect to septic systems but are also of concern in the eastern Coachella Valley due to the prevalence of septic systems in that area (refer to the section below regarding Wastewater/Recycled Water).

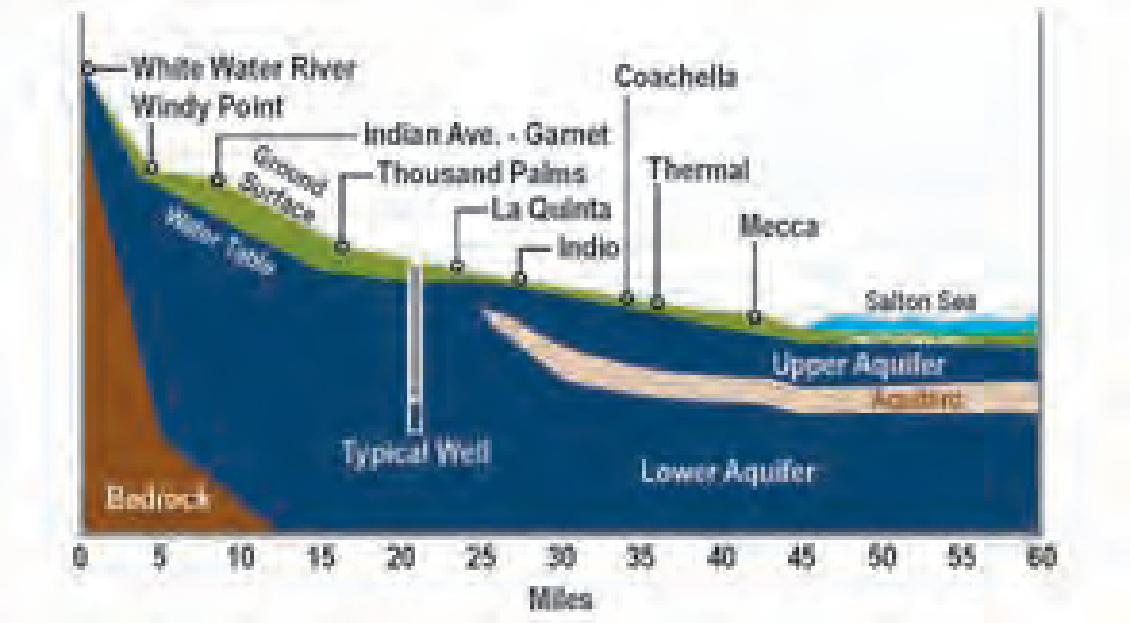
Additionally, a naturally-occurring high groundwater table within the semi-perched zone has the potential to saturate the root zone of crops and stifle growth or eliminate crop production. Therefore, a drainage system was developed for much of the eastern Coachella Valley to reclaim the area for farming. CVWD operates and maintains a collector system of 166 miles of pipe, along with 21 miles of open ditches, to serve as a drainage network for nearly 38,000 acres of irrigated lands. All agricultural drains empty into the CVSC, except those at the southern end of the Coachella Valley which flow directly to the Salton Sea. CVWD plans to begin desalting agriculture drainage to a quality equivalent to Canal water and delivering it for irrigation use by 2023 (CVWD 2005).

The CVRWMG has also addressed potential concerns regarding the organic compounds ethylene dibromide (EDB), trichloroethylene (TCE), dibromochloropropane (DBCP), and perchloroethylene (perc or PCE) in Coachella Valley groundwater. Current information demonstrates that EDB and TCE have not been detected in Coachella Valley groundwater, as both have been either banned or replaced. However, groundwater testing demonstrates that DBCP and PCE have been detected in isolated areas.

DBCP has been detected in some groundwater wells located within the Whitewater River Subbasin, and specifically in wells located in the communities of Palm Desert, Indian Wells, Bermuda Dunes, and La Quinta. DBCP was banned in California in the 1980's but was previously used as a soil fumigant that was primarily applied on grapes in the Coachella Valley to control nematodes. Despite its presence, evidence demonstrates that detected levels of DBCP range from 0.01 to 0.02 micrograms per liter (µg/L), which is below the drinking water MCL of 0.2 µg/L. CVWD monitors DBCP occurrences in the Coachella Valley and installs wells outside areas of concern or at greater depths to avoid this constituent.

Although PCE is a solvent widely used for dry cleaning and metal degreasing, detection of this substance in the Coachella Valley has been limited to isolated incidents. For example, a former dry-cleaning business has been identified as the source of a PCE plume in south Palm Springs and is currently subject to a cleanup order. PCE has also been detected in some wells in an area adjacent to the border of Rancho Mirage and Palm Desert within the Whitewater River Subbasin, although the source of PCE in this area has not been identified. When detected, PCE levels in these wells range from 0.5 µg/L to 1.5 µg/L, which is well below the drinking water MCL for PCE of 5.0 µg/L. CVWD monitors PCE occurrence in domestic wells and installs new wells outside areas of concern or at greater depths to avoid this constituent.

Figure 3-5: Coachella Valley Groundwater Basin Perched Zone



Source: (CVWD 2002)

Salinity

Some areas in the Coachella Valley such as Oasis and Salton City, as well as areas near fault lines, have naturally-occurring high salinity groundwater (CVWD 2012). TDS concentrations in groundwater may increase from artificial recharge of imported water (see Imported Water, below), from septic system waste disposal, saline underflows from the Desert Hot Springs Subbasin, and percolation of treated wastewater (CVWD et al. 2013). TDS concentrations in the groundwater basin need to be managed properly to ensure long-term suitability of groundwater quality in the basin. Potential options to manage TDS concentrations may have high costs; however, in accordance with the Recycled Water Policy, the agencies are currently developing a Salt and Nutrient Management Plan in June 2015 and are currently in the process of addressing comments from the Regional Water Quality Control Board regarding this SNMP. Although TDS concentrations in the groundwater have increased over the past decades, concentrations of TDS remain below the MCL, and vary greatly across the Coachella Valley.

If desalination of groundwater, imported water supplies, or agricultural drain water from the CVSC is implemented, brine discharge and management will be a major issue in the Coachella Valley in the future. Considerations include high costs for handling and disposing brine, large land areas for evaporation ponds, and regulatory issues associated with disposal (CVWD 2012; CVWD et al. 2013).

Arsenic

Arsenic concentrations as high as 162 µg/L (compared to the MCL of 10 µg/L) have been observed in some eastern Coachella Valley municipal water supply wells, and as a result, groundwater treatment facilities have been built and operated to reduce arsenic levels in potable water supplies. In Coachella and the

unincorporated eastern Coachella Valley communities of Mecca, Oasis, and Thermal, 19 wells at mobile home parks have recently tested positive for high levels of arsenic ranging from 12 to 91 µg/L. These parks are served by private wells and are located some distance from CVWD's potable water system. About half of the parks have installed treatment filters to reduce the arsenic levels (CVWD 2012; CVWD 2016a). Arsenic at levels of less than 1 to 28 µg/L has been detected in several groundwater wells in the Mission Creek Subbasin. Arsenic concentrations for samples collected since 1981 have remained below the MCL and samples collected for MSWD wells in 2008 do not indicate any presence of arsenic. There is limited water quality data available to assess arsenic concentrations in the Garnet Hill Subbasin. (CVWD et al. 2013). Because arsenic degrades water quality, treatment is needed before groundwater distribution if they are above MCL (CVWD 2012).

Nutrients

Higher concentrations of nitrate above the MCL of 45 mg/L have been detected in some of the shallower portions of the Coachella Valley groundwater basin (CVWD 2012; CVWD 2016a). Nitrate concentrations are below the MCL for all recorded samples in the Mission Creek Subbasin (CVWD et al. 2013). Sources of nitrate include nitrogen-based fertilizers used for agriculture, golf courses and landscaping; septic tank discharges; wastewater disposal through percolation; natural sources like mesquite hummocks; and alluvial fan formations. Nitrates are generally found in the unsaturated and shallow aquifer zones above 300 to 400 feet and have not been observed in the deeper aquifer zones below 500 feet. Activities in the basin that could cause nitrate to leach into higher quality groundwater include recharge, pumping, and overdraft reduction. As nitrates readily migrate in groundwater, specific steps, such as locating recharge activities away from areas with high nitrate concentration, treating pumped groundwater, and blending with low-nitrate supplies, may be taken (CVWD 2012; CVWD 2016a; CVWD et al. 2013; RWQCB 2004).

Fluoride

Fluoride concentrations for public wells in the Mission Creek and Garnet Hills Subbasins are below the MCL for domestic water (2 mg/L). Fluoride exceeding the MCL has been observed in one private well. While State law requires water agencies to install fluoride treatment at water supply sources contingent upon the availability of funds, there is no fluoride treatment at drinking water wells in the Mission Creek or Garnet Hill Subbasins (CVWD et al. 2013).

Chromium-6

In July 2014, the California Department of Public Health (CDPH) Division of Drinking Water (now part of the State Water Resources Control Board (SWRCB)) established the nation's first MCL for chromium-6, with a standard of 10 µg/L. However, in May 2017, the Superior Court of Sacramento County issued a judgement invalidating the MCL for chromium-6 because economic feasibility of complying with the MCL wasn't considered. Upon adoption in 2014, approximately 50% of the Region's municipal wells became non-compliant. The cost for the Region to comply with any future chromium-6 MCL containing new chromium-6 levels above the 10 µg/L MCL is of significant concern. The SWRCB has been directed to conduct further studies to determine a more economically feasible standard and is expected to adopt a new MCL in the coming years. The CVRWMG agencies are continuing to study chromium-6 reduction technologies in anticipation of a future MCL.

Uranium

The source of uranium in the Coachella Valley has not been confirmed but is likely naturally derived from the basin's geologic formations, such as those found in the Mission Creek Subbasin (CVWD 2012; CVWD

2016a; CVWD et al. 2013). Though contamination along the Colorado River was thought to be a possible source, due to large uranium deposits upstream from the Coachella Valley, subsequent monitoring indicates that trace uranium levels observed in the groundwater are naturally occurring (CVWD 2012; CVWD 2016a). Uranium is detected in several groundwater wells in the Mission Creek Subbasin although none of the wells sampled in 2008 exceeded the four-quarter average MCL of 20 picocuries per liter pCi/L. One well was taken out of service because it exceeded primary MCL for uranium. Another well has well-head treatment for uranium. There is limited water quality data available to assess uranium concentrations in the Garnet Hill Subbasin (CVWD et al. 2013).

Future Recharge Issues

Long-term recharge with SWP allocations that are delivered via exchange with MWD, although not currently an option in the Region, could generate additional groundwater quality issues, because SWP Exchange water contains more total organic carbon and bromide than Colorado River water (both of which are precursors for creating disinfection byproducts).

Perched Water Intrusion

Groundwater quality may be degraded as a result of increased Salton Sea water and perched water intrusion. Sufficiently high groundwater levels lead to freshwater flow from the Coachella Valley to the Salton Sea. However, groundwater levels near the Salton Sea are low, posing a risk of flow reversal, where Salton Sea water, which is high in salinity and of generally poor quality, may flow into the semi-perched aquifer. From the perched aquifer, this poor-quality water may flow downward into the Upper and Lower aquifers, degrading their quality (CVWD 2012).

Imported Water

Although water supplies (described in *Chapter 2 Region Description*) come from the Colorado River, their water qualities vary slightly. The Coachella Canal diversion is further downstream than the Colorado River Aqueduct diversion (see **Figure 2-4**: Statewide Imported Water Systems); this results in higher concentrations of TDS and other constituents of concern, including the potential for invasive species such as Quagga mussels. TDS concentrations have averaged in MWD's Colorado River Aqueduct water 636 ppm since 1973 and in the Coachella Canal water (Avenue 52) 790 ppm since 1949 (CVWD 2012). TDS concentrations and other constituents are listed in **Table 2-19** in *Chapter 2 Region Description*.

Therefore, issues regarding imported water supply in Coachella Valley are: salinity of Colorado River water, hardness, and minerals, and potential presence of Quagga mussels.

Salinity

As discussed in the preceding water quality sections, Colorado River water has elevated TDS concentration compared to the natural TDS concentration of the groundwater, however those levels are still below the MCL for TDS. Based on historical and projected variations in Colorado River water quality, the TDS range for Colorado River water recharged at the Whitewater River Recharge Facility is 530 to 750 mg/L, averaging 636 mg/L since 1973. The TDS range for the Colorado River water delivered via the Coachella Canal[4] is 625 mg/L to 975 mg/L, averaging 790 mg/L over the past 60 years (CVWD 2011; MSWD 2011). Artificial recharge with Colorado River water may increase TDS concentrations in the groundwater basin;

[4] The Coachella Canal transports Colorado River water from the All American Canal near the Mexico-U.S. border. The primary use of Coachella Canal water is for agricultural irrigation, although it is used to irrigate golf course and other landscape irrigation, recharge groundwater in the eastern Coachella Valley.



however, the potential for this to occur must be considered in conjunction with salt exportation and the fact that groundwater overdraft may increase TDS levels due to shifting pressure conditions, particularly in the eastern Coachella Valley (CVWD 2012).

Uranium and Perchlorate

Two constituents that have been detected in Colorado River water quality are uranium and ammonium perchlorate. Uranium concentrations below the MCL have been detected in the Colorado River water. Because of this constituent's presence, CVWD and other Valley agencies (MSWD, DWA, City of Indio, City of Coachella) will continue to monitor for radioactive materials in the Colorado River water used for recharge (CVWD 2012). Perchlorate found in Colorado River water imported to the Coachella Valley originated from the Kerr-McGee plant in Nevada on Las Vegas Wash upstream of Lake Mead. Colorado River water used in the past for irrigation and recharge in the eastern Coachella Valley led to perchlorate contamination of the groundwater. Because the source of perchlorate contamination in Colorado River water has been undergoing treatment since 1999, perchlorate is not expected to be a concern; however, continued monitoring of this constituent in both the Colorado River water and groundwater will continue (CVWD 2012; CVWD 2016a; CVWD et al. 2013; MSWD 2016).

Quagga

The non-native mollusk, *Dreissena bugensis*, also known as Quagga mussel, has been found in the Colorado River system. A Quagga mussel invasion could significantly affect the Coachella Valley's water quality, aquatic ecosystems, and water delivery systems. They have not yet been found in Coachella Canal. Quagga mussels can cause substantial economic damage associated with infestation of pipes, pumps or other components of water supply systems as well as environmental impacts removing food and nutrients from the water column and potentially collapsing the food web. Water quality may be affected by putrefactive decay of mussel flesh and methane gas production, and increased corrosion of pipelines from bacterial growth associated with the mussels (CVWD 2016a). CVWD has been proactively working to prevent the infestation and spread of Quagga mussels in the Coachella Canal and the irrigation system (CVWD 2016a).

Turbidity

Water turbidity and temperature vary greatly throughout the year in the Coachella Canal. The Canal water is typically clear in the winter when flow is low and murky in the summer as the water velocity increases enough to scour the silt from the bottom of the Canal. The principal chemical constituents concern in the Canal are TDS as described above, perchlorate (further described below), and selenium. Canal water is not suitable for domestic use without treatment (CWA 2016).

Local Surface Water

The surface water supplies currently used by DWA and those that may be diverted by the Agua Caliente Band of Cahuilla Indians are of high quality, with the concentration of TDS and nitrates both well within the MCLs.

Filtration

DWA's surface water supply complies with state and federal drinking water standards without any treatment, except disinfection where needed. One of the diversions for DWA was taken out of service in 2000 due to turbidity spikes in the source water, and it cannot be restored to potable service without filtration. DWA is currently exempted from filtration requirements due to DWA's control of the watershed,

the surface water's low turbidity, and DWA's continued monitoring of the supply[5]. In the event that filtration is required, DWA will determine whether to construct filtration facilities or use surface water supplies for groundwater recharge (DWA 2016).

Wastewater/Recycled Water

Wastewater may also impact local water quality through the leeching of septic effluent into the groundwater basin, as well as the addition of salts to the basin through irrigation with recycled water.

Wastewater

Some Coachella Valley residents utilize septic systems for wastewater treatment. Failing septic systems or a high density of septic systems have the potential to contaminate the local groundwater basin, a source of drinking water for the area.

Effluents from failing septic tanks have a high risk of polluting ground and surface water with nutrients, and human-borne pathogens. Nitrate, a water-soluble nutrient and major constituent of septic tank effluent, is a widespread ground water contaminant due largely to releases from septic tanks. Heavy pumping of water supply wells may draw down nitrate-polluted water in the unsaturated zone from septic tank discharges and contaminate ground water.

Septic Failure

As described above, if the amount of overdraft reduction is greater that the reduction in return flows, increased water levels could occur in the semi-perched aquifer. High groundwater levels in shallow perched or semi-perched aquifers can lead to waterlogging of soils which can lead to septic system failures. Septic flows are sources of nitrate and salt load to the groundwater basin, which could result in groundwater quality degradation (CVWD 2012; CVWD et al. 2013). MSWD, DWA, and CVWD are currently implementing programs to convert users from septic systems to sewer systems which would reduce the addition of nitrate to the groundwater basin (CVWD et al. 2013). The cost of addressing septic failures may disproportionately impact economically disadvantaged communities if such costs result in increased water rates or fees for low-income populations.

Recharge

Widespread use and density of septic tanks in some areas raises possible concerns about using artificial recharge to address overdraft. Changes in groundwater levels could result in septic effluent percolating from underground tanks. However, recharge in the area may reduce the nitrate levels. This issue is being studied (CVRWMG Planning Group meeting - May 19, 2010).

Recycled Water

The two potential sources of recycled water in the Coachella Valley are desalinated agricultural drainage water and treated municipal wastewater effluent. At present, golf courses and parks utilize treated municipal effluent for irrigation. Although recycled water tends to contain elevated nitrogen concentrations, studies

[5] Existing surface water treatment regulations are codified in Chapter 17 of Title 22 of the California Code of Regulations (CCR), Sections 64650 through 64666. Said regulations state that "Each supplier using an approved surface water source shall provide multibarrier treatment necessary to reliably protect users from the adverse health effects of microbiological contaminants …". "Multibarrier treatment" is defined as "a series of water treatment processes that provide for both removal and inactivation of waterborne pathogens" (CCR 2016).

at the University of California, Riverside have indicated that little nitrate moves past the root zone in well managed golf courses (RWQCB 2006).

The key concerns regarding the quality of recycled water for the IRWM Region are: potential percolation of recycled water with elevated nitrogen concentrations; timing of peak flows; regulatory conflicts associated with recycled water use; and high costs and large energy requirements.

Matching Quality to Use

Local sources need to be considered, including recycling and stormwater harvesting, in providing water supply to non-potable users. Large irrigators (agriculture and golf courses) may be supplied recycled water from municipal effluent, desalinated agricultural drainage water, or untreated Canal water.

Salinity and Nutrients

Currently, recycled water in the western Coachella Valley is either reused or percolated for disposal (percolated water enters the groundwater basin). Wastewater contains nutrients, and where water is recycled for irrigation uses, much of the nutrients are taken up by the plants and turf, thus reducing the need for fertilizer and contribution of nutrients into the groundwater basin. The State Water Resources Control Board (SWRCB) Recycled Water Use Policy requires every region in the state to develop a salt/nutrient management plan by 2014. The salt/nutrient management plans are intended for management of all sources contributing salt/nutrients, including recycled water, on a basin-wide or watershed-wide basis to ensure that water quality objectives are achieved (CVWD 2012; CVWD et al. 2013).

In addition to salts and nutrients, another water quality issue related to recycled water is emerging contaminants. The SWRCB Recycled Water Policy acknowledges the incomplete and evolving knowledge of emerging contaminants and provides for research and development of analytical methods to determine their potential for environmental and public health impacts. The impact this regulation would have on water management planning efforts in the Coachella Valley is not known at this time (CVWD 2012).

Regulatory Conflicts

Regulatory conflicts regarding recycled water use have arisen between the SWRCB and California Department of Public Health (CDPH). While the SWRCB promotes and encourages the use of recycled water and has statewide goals for increasing recycled water, CDPH permitting of recycled water systems can potentially restrict the use of this water source. These regulatory conflicts can make implementation of recycled water systems challenging and costly for local agencies.

Costs

Planning and implementing recycled water systems, including treatment plant upgrades to tertiary and distribution system expansions, involves high costs and large energy requirements. While the use of recycled water could represent an efficient water supply, at around $400 per AF, development of a non-potable distribution system could be costly (CVWD 2012). The CVRWMG Proposition 84 – Round 2 Implementation Grant application (March 2013) included a project that would connect three golf courses to the Mid-Valley Pipeline, which blends recycled water with other non-potable water for distribution.

Stormwater

Contamination of drinking water wells from agricultural and urban stormwater runoff is a concern for improperly constructed wells the Region (CVWD 2012). Improperly constructed wells can increase the potential for contamination from runoff and groundwater (CVWD 2012). Stormwater pollution can pose a serious health risk to people due to pesticides, bacteria, and chemicals being picked up as water drains from streets, parking lots, and lawns and enters the WRSC/CVSC untreated.

Coachella Valley Stormwater Channel

The CVSC is a continuation of the WRSC and runs from Washington Street to the Salton Sea. The CVSC is listed on the 303(d) List of 303(d) List of Water Quality Impaired Segments for DDT, Dieldrin, PCBs, E. Coli and toxaphene. The source of the contamination is unknown. With the exception of pathogens which apply to a 17 mile stretch area of the CVSC, the remaining constituents apply to a 2 mile stretch of the CVSC. Total Maximum Daily Loads (TMDLs) are being developed for all of these parameters (SWRCB 2010).

Salton Sea

Salton Sea is listed on the 303(d) List of Water Quality Impaired Segments for arsenic, chlorpyrifos, DDT, Enterococcus, nutrients, salinity, and selenium. The sources of nutrients are agricultural return flows and major industrial point source. The sources of salinity are out-of-state source, agricultural return flows, and unspecified point source. TMDLs are being developed for all of these parameters (SWRCB 2010).

3.1.6 Flood Management

CVWD and RCFCWCD's regional flood control systems consist of a series of debris basins, levees, and stormwater channels that convey floodwaters from the mountains and alluvial fans surrounding the Coachella Valley to the 49-mile WRSC/CVSC. Cities in the Coachella Valley (including the City of Indio/Indio Water Authority (IWA) and the City of Coachella/Coachella Water Authority (CWA)) provide local drainage control within their jurisdictions through a system of storm drains, retention basins, and dry wells; some of the flows from the local facilities contribute to flows within the stormwater channel. Implementation of BMPs, along with low annual rainfall and low urban density, have substantially reduced runoff from urban areas into the stormwater channel such that such flows are rare except in cases of major storm events (wet weather conditions). During dry weather conditions, local contributions from local facilities are rare due to implementation of BMPs.

The WRSC/CVSC and its tributary channels along with the implementation of stormwater BMPs protect the Coachella Valley cities from Palm Springs to Coachella from flooding. Areas that are not protected by regional flood control infrastructure and are located within identified flood hazard areas may be subject to alluvial-fan flash flooding from the surrounding mountain ranges (refer to **Figure 3-6**). In addition to areas located within identified (mapped) flood hazard areas, there are several areas of the Region that are not covered by flood hazard mapping.

Flood issues within the Region may be related to land use planning issues, because development is restricted within known flood hazard areas and therefore potentially impedes development. Stakeholders have expressed concerns that without additional flood control facilities, the need for affordable housing may drive allowances for housing to be built in flood-prone regions. **Figure 3-6** shows the areas recognized as at-risk for flooding by Federal and State flood mapping agencies.

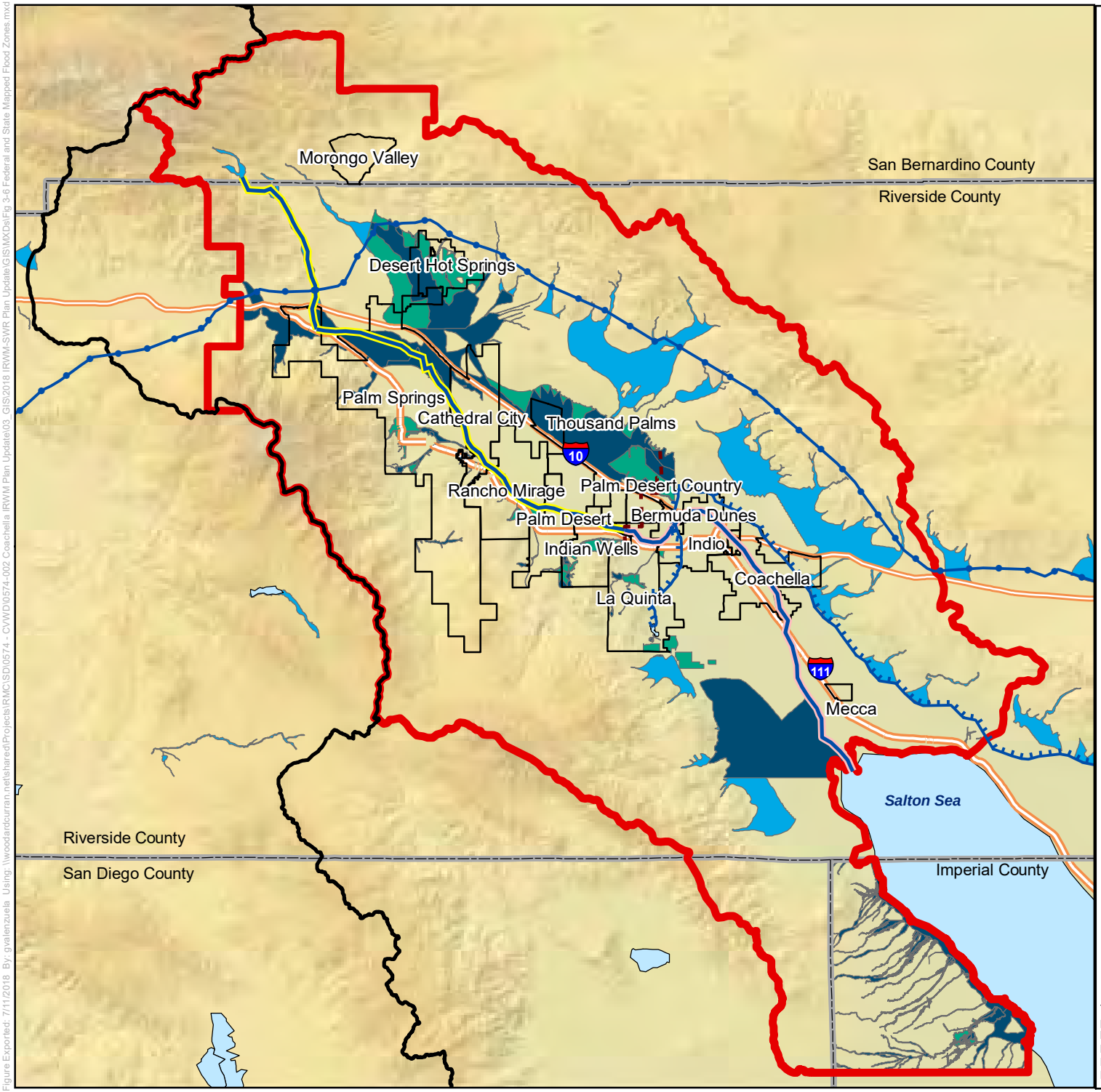


Alluvial and Riverine Flooding

Much of the Coachella Valley is subject to alluvial and riverine flooding but has not been mapped by the Federal Emergency Management Agency (FEMA). Several at-risk areas lack flood control facilities and are vulnerable to such flooding. Those areas include:

- Areas adjacent to Mission Creek in the Desert Hot Springs area
- Sky Valley and Indio Hills
- Thousand Palms
- Portions of Indio north of Interstate 10
- The Oasis community extending from Avenue 66 to Avenue 86
- Areas adjacent to the CVSC south of Avenue 52
- Highway 111 between Palm Springs and Cathedral City
- Roadways that cross the Whitewater River

As mentioned in *Chapter 2 Region Description*, CVWD has undertaken a stormwater planning effort for North Cathedral City and Thousand Palms and has commissioned a series of studies in support of this effort. These studies have examined the existing conditions, identified geography and some man-made features as contributors to flood risks, and developed flood control alternatives. As with other flood control in the Region, these alternatives consist of levees, culverts, and channels designed to convey stormwater away from development and into the existing stormwater control channels, such as the WRSC/CVSC. The studies conducted for the Stormwater Master Plan effort also noted the importance of integrated, coordinated flood control planning, and the expensive nature of flood control projects (CVWD 2013d). In addition, the CVRWMG has updated this IRWM/SWR Plan to serve as a Stormwater Resource Plan (SWRP) functional equivalent.



Federal and State Mapped Flood Zones

Figure 3-6

Legend

- Division between Western and Eastern Coachella Valley
- Colorado River Aqueduct
- Coachella and All American
- Whitewater River Stormwater Channel
- Coachella Valley Stormwater Channel
- Highways
- Water Bodies
- Colorado River Funding
- IRWM / SWR Planning
- County Lines
- City Boundaries
- DWR Flood Awareness
- FEMA 100-year Flood Zone
- FEMA 500-year Flood Zone

0 1.75 3.5 7 10.5 14 Miles

N

Map Created: June 2018

Third Party GIS Disclaimer: This map is for reference and graphical purposes only and should not be relied upon by third parties for any legal decisions. Any reliance upon the map or data contained herein shall be at the users' sole risk. **Data Sources: FEMA Flood Zone Designations, 2012 DWR California's Flood Future Report, 2013**

Figure Exported: 7/11/2018 By: gvalenzuela Using: \\woodardcurran.net\shared\Projects\RMC\SD\0574 - CVWD\0574-002 Coachella IRWM Plan Update\03_GIS\2018 IRWM-SWR Plan Update\GIS\MXDs\Fig 3-6 Federal and State Mapped Flood Zones.mxd

3.1.7 Natural Resources

Key issues concerning the Region's water-related natural resources are addressed in this section.

Habitat Conservation

The Region may support populations of sensitive species such as migratory birds and endangered desert pupfish listed by California and the federal government. At the north end of the Salton Sea, the CVSC provides important sheltering, nesting, and feeding resources for migratory and resident waterfowl.

A Multiple Species Habitat Conservation Plan (MSHCP) was prepared for the entire Coachella Valley and surrounding mountains to address state and federal Endangered Species Act issues in the IRWM/SWR Plan Area. Conservation approaches, involving acquisition, biological monitoring, and adaptive management actions, have been identified in the MSHCP to achieve conservation of natural communities. Key water-related natural resource issues for the Coachella Valley include the need for permanent water availability for native flora and fauna; and preserving, restoring, and managing its water-related natural resources.

Water Availability

Changes in the water table or flows to the Salton Sea could affect water availability and success of conserving habitat for specific species covered by the MSHCP. Specifically, the MSHCP calls for establishing and providing a permanent water source for the following:

- Permanent habitat for the California black rail and Yuma clapper rail in the CVSC and Delta Conservation Area.
- Riparian habitat for covered riparian bird species in the CVSC and Delta Conservation Area.
- Desert pupfish habitat.
- Established mesquite on CVWD land in the East Indio Hills Conservation Area, if needed.

In addition, the MSHCP specifies the requirement to develop and implement a monitoring and adaptive management program for desert pupfish in the agricultural drains and flood control channels, and to restore and enhance habitat for the Coachella Valley round-tailed squirrel and mesquite on CVWD land in the East Indio Hills Conservation Area (CVAG 2007).

Salton Sea

Although the Salton Sea is not within the Region, local stakeholders acknowledge that permitted waste discharges and agricultural drains ultimately flow to the Salton Sea and can impact its wetlands resources.

The Salton Sea is the largest lake in California and has served as a recreational attraction, avian refuge and is a great source of biodiversity. The northern end of the Salton Sea has been described as a freshwater marsh that provides nesting areas, shelters, and feeding resources for migratory waterfowl, including federally listed endangered species. However, the Salton Sea has no natural outlet other than evaporation. Salinity has been steadily increasing due to the lack of discharge; water evaporation thus leaves behind high concentrations of salt.

To ensure continued restoration and protection of wildlife dependent on the Salton Sea ecosystem, three pieces of legislation (Senate Bill 277, Senate Bill 317, and Senate Bill 654) were signed by Governor

Schwarzenegger in September 2003, committing the state to a restoration path for the Salton Sea, establishing a Restoration Advisory Committee, and providing limited relief from California's Fully Protected Species Act. By October 2003, the QSA had been signed by local, state and federal agencies.

Wetlands

Coachella Valley drains southward to the Salton Sea, with flows containing treated wastewater effluent, rising groundwater and subsurface drain flows, and storm flows following major storm events. Where the CVSC and agricultural drains empty into the Salton Sea, there are mixed open water and freshwater cattail-reed marshes, and cottonwood-willow riparian stands that are supported by freshwater flows from the channels. The Torres-Martinez Tribe of Desert Cahuilla Indians (TMDCI) has developed an 85-acre wetland system on the shore of the Salton Sea west of the CVSC outflow. The wetland supports migratory and resident birds and other sensitive species that depend on increasingly scarce wetland habitat. DWR and California Department of Fish and Wildlife (CDFW) predict that declining inflows in future years will result in ecosystem collapse of the Salton Sea due to increasing salinity and other water quality issues. Certain species, including the pileworm, a primary component of the Salton Sea food web, and tilapia, the primary forage species for fish-eating birds, may be eliminated if salinity levels further increase. Loss of fish populations and invertebrates could in turn reduce bird populations (CVWD 2012). thus, preservation of the water sources and the quality of their water is critical to the survival and propagation of numerous wildlife species.

Groundwater Outflow

In addition to biological impacts, changes in the flows to the Sea and hence the freshwater-saltwater boundary could affect water quality of the Coachella Valley Groundwater Basin. Freshwater flows from the Coachella Valley aquifers towards the Salton Sea if groundwater levels are sufficiently high. Currently, groundwater levels adjacent to the Sea are below the level of the Sea, which may induce the movement of the denser saline Sea water into the fresher groundwater aquifers, and cause intrusion into the semi-perched aquifer if groundwater levels drop. This intruded water could eventually migrate vertically downward into the underlying upper and lower aquifers causing groundwater quality degradation. As groundwater levels in the basin declined, the rate of groundwater outflow to the Salton Sea has decreased (CVWD 2012).

3.1.8 Disadvantaged Communities

As described in *Chapter 4 Disadvantaged Communities*, stakeholders in the Region stated that previous maps of DACs did not fully capture the economic reality of the region. To address these stakeholder concerns, the DAC Outreach Program conducted extensive outreach to improve understanding of which areas in the Region qualify as DACs. These efforts and the resulting DAC maps are provided in *Chapter 4 Disadvantaged Communities*.

Based on meetings with DAC stakeholders and representatives, issues of concern for both eastern and western Coachella Valley residents related to DAC water supplies focus around the affordability and accessibility of a safe drinking water supply that is in compliance with state and federal requirements in order to meet the needs of both eastern and western Coachella Valley residents (see *Chapter 4 Disadvantaged Communities*). Education programs may be needed to inform residents of the safety or hazards of their groundwater supplies and other potential water supply and quality issues. Stakeholders have also noted that there may be conflicts between landowners and residents of DACs in instances when economic interests of landowners' conflict with the interests of onsite DAC residents; this issue specifically

pertains to the IRWM Program when such issues involve provision of adequate water and wastewater services.

Water and Sewer Infrastructure

DACs acknowledged there is a lack of basic water and wastewater infrastructure (onsite wastewater facilities are undersized or inadequate in low percolation areas) in DAC communities in the eastern Coachella Valley. Septic systems in the western Coachella Valley (including DACs) may be too densely located or otherwise improperly designed or failing, posing a contamination threat to the Desert Hot Springs Subbasin that is used for potable water supplies. Inadequate wastewater infrastructure is a public health hazard that can expose residents to untreated sewage. Untreated sewage may also leak into local ground or surface waters or spill near residential areas. DACs described a number of issues that indicate a problem with their wastewater infrastructure. For more detailed information on the water and wastewater infrastructure needs, refer to *Chapter 4 Disadvantaged Communities*.

Affordability

Affordability of water and wastewater is a key issue for DACs. As described in *Chapter 2 Region Description, Section 2.5.1 Groundwater Quality*, arsenic levels exceed MCL drinking water standards in localized areas in the eastern Coachella Valley. This issue is complicated by other issues such as affordable housing; for instance, there are many unpermitted mobile home parks in the eastern Coachella Valley that do not receive the required water system monitoring and provide housing to residents that cannot afford necessary treatment and testing procedures on their own. The CVRWMG has been working with local non-profits to address issues associated with water treatment. As described in detail in *Chapter 4 Disadvantaged Communities*, the CVRWMG developed an onsite water treatment program aimed at providing reverse osmosis systems to eastern Coachella Valley residents to treat for constituents such as arsenic in drinking water. The eastern Coachella Valley communities are located within the service area of CVWD; that agency's long-term water supply planning will address the desire for these communities to potentially connect to CVWD's drinking water and wastewater systems.

Nutrients in Hot Water

Poor groundwater quality in the hot water aquifer has the potential to have adverse economic impacts on the hot water resources in the western Coachella Valley's Desert Edge and Desert Hot Springs communities. Comprised of senior residents on fixed incomes, many of these small DACs desire to convert local septic systems to municipal sewer in order to ensure that water quality of the hot water resources is maintained. The County of Riverside and the CVRWMG are also involved in these issues. To date, two of the nine projects submitted for IRWM grant funding have been targeted towards providing sewer infrastructure to the Desert Hot Springs community.

Rural Access to Water

Available water supplies with adequate quality is limited in many rural communities, as wells above the perched aquifer, hot water basin wells, and agricultural wells are not suitable for drinking, and hauled water may be scarce or entirely inaccessible due to location of the communities. Many DACs are not within urban areas and as such municipal services hookup is difficult. An example of this is concentrated communities of farm workers in rural areas. Water quality issues are of particular concern in the eastern Coachella Valley, where many small mobile home parks are dependent on small private wells. These wells are not monitored and may be at risk of high levels of arsenic or potentially other pollutants, which have been found in

localized areas of the groundwater basin. Rural water treatment systems (point of source or other new technologies) and system maintenance training are needed in these rural/remote areas as discussed in *Chapter 4 Disadvantaged Communities.*

Flooding and Stormwater

Flooding and stormwater management improvements are needed to address flooding hazards in DAC areas, particularly in unincorporated communities that are not protected by regional flood control infrastructure. The expensive nature of flood control and stormwater management projects may impede their implementation in DACs. Further, onsite flooding has been noted as a concern in many DACs, particularly in the eastern Coachella Valley, whose soils are not conducive to rapid percolation. The resulting standing water also presents a public health hazard by creating conditions that foster disease vectors such as mosquitos.

3.1.9 Tribal Nations

Based on meetings with tribal communities, issues of concern include water and wastewater infrastructure, groundwater water quality, groundwater quantity, tribal water rights, and habitat protection/restoration, recycled water. Issues faced by tribal nations, namely the lack of adequate water and wastewater infrastructure and the high costs associated with improving it. There is a lack of basic water and wastewater infrastructure on some tribal lands in the eastern Coachella Valley. For instance, private sewer facilities are undersized or inadequate in low percolation areas.

The tribes share the Coachella Valley Groundwater Basin, using groundwater wells where municipal water is not available. Like other Coachella Valley users, the tribes are also concerned about regional water issues such as groundwater supply and quality (refer to *Chapter 5 Tribal Water Resources* for more information). Groundwater quality in some areas is unsuitable for certain uses. Testing at mobile home parks on tribal lands has found arsenic concentrations of 60-70 ppm compared to the 10 ppm MCL. Due to water quality issues, some tribes rely on bottled water for drinking water supply. The tribes have also expressed concern about increasing TDS concentrations due to recharge activities.

Resource management for sustainability is important to tribes. For example, in the WRSC on the Twenty-Nine Palms Reservation, flood control channel operations and maintenance activities could potentially impact native plant species or habitats that are culturally important to the tribes. There are also culturally-significant water resources on tribal lands. Tribes wish for these resources to be recognized in the IRWM/SWR Plan.

Tribal water rights are not included as an issue in the following sections, because this issue is not one that can be addressed through IRWM planning due to the lack of regulatory authority associated with the IRWM/SWR Plan (refer to *Chapter 5 Tribal Water Resources* for more information). However, the CVRWMG acknowledges tribal water issues that have been expressed by stakeholders and will continue to work through the IRWM process to improve and strengthen relationships with local tribes.

Water and Sewer Infrastructure

Tribal communities acknowledged there is a lack of basic water and wastewater infrastructure (private sewer facilities are undersized or inadequate in low percolation areas) on some tribal lands in the eastern Coachella Valley, and the issue of costs for these services is a concern for certain tribes.

Water Quality

Water quality is also a major concern, including salinity levels, elevated arsenic concentrations, and septic leaching issues and their impacts on the Coachella Valley's groundwater basins.

Water Quantity

Water quantity is a concern, especially as it relates to long-term groundwater overdraft.

Resource Management

Resource management is important to the tribes; for example, the TMTDCI is concerned about both the volume and quality of water flowing to the Salton Sea and their effects on the Salton Sea ecosystem restoration (CVRWMG Tribe meeting - May 20, 2010).

Expansion of Recycled Water

Further expansion of recycled water systems has provided water supplies to tribal development authorities for use on golf courses and other non-potable uses. In 2009, DWA executed a Reclaimed Water Service Agreement with the Agua Caliente Development Authority for Indian Canyons Golf Course (DWA 2009b).

3.1.10 Summary of Water Management Issues

As with other regions throughout the State, the Region is facing a variety of water-related issues that can be addressed through the IRWM/SWR planning process. Issues identified in this chapter range from the need to secure additional imported water supplies to the quantity and quality of local groundwater to lack of regional flood control.

Table 3-2 below provides a preliminary evaluation and summary of the top 12 categories of key water management issues in the Coachella Valley.



Table 3-2: Summary of Significant Water Management Issues in Coachella Valley

#	Category	Key Issues
1	Reliability of Water Supply	Regional population projections include continued growth, equating to water demand increases. Municipal demands are expected to increase at a faster rate than agricultural demands primarily due to population growth. Seasonal demands may not coincide with supply availability, so water supply reliability needs to coordinate supply availability with demand.
2	Groundwater Levels	Basin pumping exceeds total recharge. Pumping needs to be brought into balance through increased recharge, source substitution, and conservation. Failure to achieve this balance could lead to continued water level declines, water quality degradation, and land subsidence, which can result in loss of groundwater storage and impacts on infrastructure. If overdraft is reduced, and return flows are not reduced, areas over the shallow and semi-perched aquifers could experience soil waterlogging, with impacts to septic systems, utilities, agriculture, and other vegetation. Agricultural drain use will need to continue to maintain groundwater levels. Reliability of water supplies will affect the Region's ability to offset groundwater pumping with recharge efforts.
3	Imported Water Supply	SWP supplies are less reliable due to Statewide drought conditions and environmental constraints (which have led to reduced pumping) in the Delta. Colorado River supplies are vulnerable due to the prolonged Colorado River Basin drought.
4	Local Supply Opportunities	Local sources need to be considered, including recycling and stormwater harvesting. Large irrigators (agriculture and golf courses) may be supplied recycled water from municipal effluent, desalinated agricultural drainage water, or untreated Canal water. Challenges associated with cost-effectively linking recycled water supply to customers (i.e., strategic location of treatment facilities) must be met, possibly through inter-agency partnerships. Other challenges may include regulatory obstacles (ability to meet water quality standards), user resistance, physical limitations, and infrastructure limitations.

Table 3-2: Summary of Significant Water Management Issues in Coachella Valley

#	Category	Key Issues
5	Groundwater Quality	The salinity of Colorado River water is higher than the salinity of SWP Exchange water, recycled water, and some groundwater. Therefore, the use of Colorado River water for recharge and irrigation may result in the addition of salt to the basin if salts are not exported. In eastern Coachella Valley, agricultural drains help export salts from the basin through artesian flows. SWP Exchange water contains more total organic carbon and bromide than Colorado River water (both of which are precursors for creating disinfection byproducts). Long term recharge with SWP Exchange supplies could increase the concentration of these constituents. Although the Coachella Valley Groundwater Basin has had historically high water quality, regional groundwater quality is potentially at risk for increased salinity and nitrates. Individual domestic septic tanks and leach fields, fertilizer application, and wastewater percolation ponds are likely sources of natural organic contaminants. Several small private water systems in mobile home parks in eastern Coachella Valley have data that shows groundwater quality exceeds the MCLs for arsenic. Many private water systems supplying water to small mobile home parks in the eastern Coachella Valley do not test or report on drinking water quality; therefore, data on MCL exceedances are likely undercounted. Dependable arsenic removal systems and water quality testing are needed. The 10 µg/L MCL for chromium-6 that was issued in 2014 has since been invalidated. However, the SWRCB has been directed to conduct further studies to determine a more economically feasible standard and is expected to adopt a new MCL in the coming years. A new, lower MCL has the potential to be of substantial concern for the Region. The CVRWMG agencies are continuing to study chromium-6 reduction technologies in anticipation of a future MCL. Groundwater quality may also be impacted by failing septic systems, which may be too expensive for DACs to address, particularly in the eastern Coachella Valley.
6	Surface Water Quality	The last 17 miles of the CVSC, which conveys flows to the Salton Sea, is listed on the 303(d) List of Water Quality Impaired Segments for DDT, dieldrin, PCBs, pathogens, and toxaphene. The Salton Sea is listed on the 303(d) List for arsenic, chlorpyrifos, DDT, Enterococcus, nutrients, salinity, and selenium.
7	Local Environment	A permanent water source for permanent riparian habitat is needed for the California black rail, Yuma clapper rail, and riparian bird species in the CVSC and Delta Conservation Area. Changes in flow to the Sea may impact this habitat as a result of changes caused by falling groundwater levels that reduces flows entering the agricultural drain system, among others. Quagga mussels have been found in Colorado River, but not yet in the Coachella Valley and its water systems. Monitoring and preventative measures will continue, to prevent the impacts of Quagga mussel spread to the region.



Table 3-2: Summary of Significant Water Management Issues in Coachella Valley

#	Category	Key Issues
8	Flood Risks	Several areas lack flood control facilities and are vulnerable to devastating alluvial and riverine flooding. From Avenue 52 to Salton Sea, the CVSC lacks bank stabilization and is in a levee condition meaning that the estimated surface elevation of Standard Project Flood is higher than the elevation of adjacent properties. Coordination between land use planning and flood prevention planning could address some of the flood issues the Region faces.
9	Conjunctive Use	Potential increases in conjunctive use, to the degree that recharge and source substitution are increased more than net outflow, could lead to a solution to overdraft-related problems facing the basin. Key issues that must be addressed include completion of the SWP aqueduct extension and amount of this additional recharge water, its cost, its reliability, and its quality.
10	Water-Related Needs of Native Americans	There is a lack of basic water and wastewater infrastructure on some tribal lands in the eastern Coachella Valley. For instance, private sewer facilities are undersized or inadequate in low percolation areas. Tribes expressed the importance of sustainable resource management to protect the natural environment that is of cultural importance. Tribes expressed concerns over groundwater quality (salinity, arsenic, septic leaching), groundwater overdraft, resource management, and expansion of recycled water.
11	Water-Related Needs of Disadvantaged Communities	Many DACs are not within urban areas, making water supply difficult. One example is farm workers in rural areas. Rural water treatment systems (point of source or other new technologies) and training are needed in these rural/remote areas. The need for septic to sewer conversion or connection to municipal water systems is great, but DACs worry that jurisdictional issues or high costs may delay or prohibit project construction. Further, DACs have noted that conflicts between landowners and residents may arise with regard to provision of water and wastewater services if such provision requires additional expenditures on behalf of landowners.
12	Affordability of Water	Cost related to continued overdraft could include: reduced groundwater storage capacity; increased power consumption due to increased pumping lifts; repair and replacement of damaged infrastructure; and additional water treatment requirements due to decreases in water quality. Changing regulatory requirements and legal challenges could also potentially impact the affordability of water in the region. Planning and implementing a recycled water system, including treatment plant upgrades to tertiary and distribution system expansions, involves high costs and large energy requirements.

3.2 Climate Change Issues and Needs

DWR requires IRWM Plans to include an analysis of the effects of climate change on a Region and their water resources. The Region underwent a climate change analysis to consider the potential impacts and effects that have been projected, determine which of these impacts have the potential to affect the Region, identify vulnerabilities of regional water resources due to the potential projected impacts, and prioritize these vulnerabilities to more effectively manage for potential projected climate change effects.

3.2.1 Projected Impacts and Effects of Climate Change

Estimating the impacts of climate change at a regional level is challenging due to the coarse spatial scale of models that project climate change impacts of temperature and rainfall, and the long-time scale evaluated in many models (to the year 2100). Recently, state and regional entities have been working to downscale climate models to allow for climate change planning at a level that can be useful for planning efforts. These downscaled models provide outputs for the year 2050, and while this is still a longer timescale than is used in IRWM planning, it can still be useful for assessing climate change.

To incorporate climate change into water resources management, downscaled temperature and precipitation projections were inputted into other models, such as hydrologic models, to project impacts to water supply, water demand, snow pack, sea level rise, and wildfires. The results of these models have been summarized in a variety of studies and planning documents at the state, regional, and local levels. A number of these documents were reviewed to determine which best represented the impacts for the Region. These documents include:

- Preparing California for a Changing Climate (PPIC 2008)
- Reconciling Projections of Colorado River Streamflow, Southwest Hydrology (Hoerling et al. 2009)
- Response of Vegetation Distribution, Ecosystem Productivity, and Fire to Climate Change Scenarios for California (Lenihan, et al. 2008)
- *Climate change Adaptation Policy Guide* (CA Emergency Management Agency and CA Natural Resources Agency 2012)
- Climate Action Plans (Palm Springs, Rancho Mirage, Palm Desert, Coachella, Desert Hot Springs, La Quinta)

Climate change impacts and effects are based on very different climate change assumptions and analysis approaches. **Table 3-3** summarizes the impacts and effects of climate change on the Region by 2050 (unless otherwise indicated), which are typically based on an average of various climate change analyses. Generally, climate change is expected to increase temperature in the region. Rainfall projections vary, though there is little to no projected change in annual average rainfall. Water demand may be expected to increase due to higher irrigation needs caused by increased temperatures.

Imported water supply from the Colorado River Aqueduct may be impacted by expected decreased flows in the Colorado River from climate change. Up to a 20% decrease in Colorado River flow has been projected. (Hoerling, et al. 2009)

Climate changes may also slightly increase the frequency of wildfires. Increases in wildfires have the potential to increase sedimentation and turbidity of surface waters and increase flash flooding. (Lenihan, et al. 2008) Although lands that have been subject to stochastic events such as wildfire can be potentially be



susceptible to invasion by non-native vegetation, such as non-native grass and/or tamarisk, native species often re-sprout vigorously following a fire. If lands were previously dominated by native vegetation, these native species typically re-establish first and can outcompete non-native species that may be introduced afterwards. Where non-native species establish, there can be changes to the soil hydrology and chemistry.

Knowing the projected climate change impacts and effects in the Region, it is possible to determine which water resources in the Region are most vulnerable to climate change. The next sections identify and prioritize the vulnerabilities to help determine how to best apply management practices.

Table 3-3: Impacts and Effects of Climate Change on Region by 2050[1]

Impact	Effect
Temperature	Winter: Projected increases of 5°F to 9°F Summer: Projected increases of 6°F to 10°F
Rainfall	Little to no change in annual average rainfall
Supply	Colorado River flow decreases of 5% to 20%
Demand	Increases expected with higher temperatures, but not quantified
Wildfires	Same or slightly increased likelihood of wildfire

1. Information presented in this table is from the list of references provided on the preceding page

3.2.2 Identification of Climate Change Vulnerabilities

Understanding the potential impacts and effects that climate change is projected to have on the Region allows for an informed vulnerability assessment of the Region's water resources. A climate change vulnerability assessment helps assess water resource sensitivity to climate change, prioritize climate change vulnerabilities, and ultimately guides decisions as to which strategies and projects would most effectively adapt to and mitigate climate change. Key indicators of potential vulnerability include (DWR 2011):

- Currently observable climate change impacts (climate sensitivity)
- Presence of particularly climate sensitive features, such as specific habitats and flood control infrastructure (internal exposure)
- Resiliency of a region's resources (adaptive capacity)
- An analysis of the Region's vulnerabilities to climate change was developed and presented at the December 13, 2012 Planning Partners meeting by asking a series of questions suggested by DWR in its 2011 *Climate Change Handbook for Regional Water Planning.* **Table 3-4** summarizes the analysis, which includes:
- Vulnerability Question: Taken from Box 4-1 of DWR's *Climate Change Handbook*
- Answer: Determined according to the Region's current conditions and stakeholder feedback
- Justification: Why Y (yes) or N (no) was selected
- Vulnerability Issue: What is the climate change vulnerability issue that is identified by asking the question?



Following this analysis, the vulnerability issues were prioritized and vetted by the Region. The relative prioritization (low, medium, and high) are also indicated in **Table 3-4**.



Table 3-4: Climate Change Vulnerability Indicator Questions

Vulnerability	Y/N	Justification	Vulnerability Issue	Tier
Water Demand				
Are there major industries that require cooling/process water in your planning region?	Y	Vegetable packing plants require process water, but the Region as a whole is accustomed to large temperature shifts already.	Industrial demand would increase	Low
Are crops grown in your region climate-sensitive? Would shifts in daily heat patterns, such as how long heat lingers before night-time cooling, be prohibitive for some crops?	Y	Some fruits and vegetables grown in the area may be affected by changes in heat patterns.	Crop demand would increase	High
Is groundwater storage able to buffer drought?	Y	Groundwater storage provides an excellent buffer to drought events.	Lack of groundwater storage to buffer drought	Med
Is there additional ability to conserve further?	Y	Water conservation measures are in place throughout the Region.	Limited ability to conserve further	Med
Does water use vary by more than 50% seasonally in parts of your region?	Y	Agricultural, residential and golf course irrigation demand increases substantially in the summer.	Limited ability to meet summer demand	Med
Are some instream flow requirements in your region either currently insufficient to support aquatic life, or occasionally unmet?	N	Surface waters are ephemeral	Habitat demand would be impacted	N/A



Vulnerability	Y/N	Justification	Vulnerability Issue	Tier
Water Supply				
Does a portion of the water supply in your region come from snowmelt?	Y	Portion of supply from snowmelt in San Gorgonio and Santa Rosa mountains is low.	Decrease in local surface supply	Low
Does part of your region rely on water diverted from the Delta, imported from the Colorado River, or imported from other climate-sensitive systems outside your region?	Y	Region is dependent on Colorado River water.	Decrease in imported supply	High
Would your region have difficulty in storing carryover supply surpluses from year to year?	N	Groundwater basins have excess storage capacity, and facilities are in place to recharge.	Decrease in seasonal reliability	N/A
Does part of your region rely on aquifers with the potential to be affected with salt intrusion? Has salt intrusion been a problem in the past?	Y	Salt intrusion could potentially come from the Salton Sea and the eastern Coachella Valley perched aquifer.	Decrease in groundwater supply	Low
Has your region faced a drought in the past during which it failed to meet local water demands?	N	Did the Region implement drought management measures??	Sensitivity due to higher drought potential	N/A
Does your region have invasive species management issues at your facilities, along conveyance structures, or in habitat areas?	Y	Quagga mussels in Colorado River Aqueduct	Invasive can reduce supply available	Med
Water Quality				
Are increased wildfires a threat in your region? If so, does your region include reservoirs with fire-susceptible vegetation nearby which could pose a water quality concern from increased erosion?	Y	Climate change projections show little to no increase in wildfire in the Region, though fires in the surrounding mountains could increase flood damage and sedimentation.	Increased erosion and sedimentation	Low



Vulnerability	Y/N	Justification	Vulnerability Issue	Tier
Does part of your region rely on surface water bodies with current or recurrent water quality issues related to eutrophication, such as low dissolved oxygen or algal blooms? Are there other water quality constituents potentially exacerbated by climate change?	Y	Region relies on local surface waters for supply, but use of local surface water is low.	Poor water quality in surface waters	Low
Are seasonal low flows decreasing for some water bodies in your region? If so, are the reduced low flows limiting the water bodies' assimilative capacity?	N	Rivers in the area are dry except during storm events.	Increased constituent concentrations	N/A
Are there beneficial uses designated for some water bodies in your region that cannot always be met due to water quality issues?	N	Whitewater River has a recreational designation, but has never been closed to the public due to water quality issues.	Decrease in supply and/or recreational opportunity	N/A
Does part of your region currently observe water quality shifts during rain events that impact treatment facility operation?	N	No direct treatment of surface water	Increase in treatment needs and costs	N/A
Sea Level Rise				
Has coastal erosion already been observed in your region?	N	Not applicable	Not applicable	N/A
Are there coastal structures, such as levees or breakwaters, in your region?	N	Not applicable	Not applicable	N/A
Is there significant coastal infrastructure, such as residences, recreation, water and wastewater treatment, tourism, and transportation) at less than six feet above mean sea level in your region?	N	Not applicable	Not applicable	N/A
Is there land subsidence in the coastal areas of your region?	N	Not applicable	Not applicable	N/A
Are there climate-sensitive low-lying coastal habitats in your region?	N	Not applicable	Not applicable	N/A



Vulnerability	Y/N	Justification	Vulnerability Issue	Tier
Are there areas in your region that currently flood during extreme high tides or storm surges?	N	Not applicable	Not applicable	N/A
Do tidal gauges along the coastal parts of your region show an increase over the past several decades?	N	Not applicable	Not applicable	N/A
Flooding				
Does critical infrastructure in your region lie within the 200-year floodplain?	Y	Pump stations and pipelines, treatment plants could be impacted. Facilities currently in place are designed for SPF (250-year storm/flood), so increased flooding could be manageable.	Increases in inland flooding	High
Does aging critical flood protection infrastructure exist in your region?	Y	eastern Coachella Valley lacks adequate flood control		
Have flood control facilities (such as impoundment structures) been insufficient in the past?	Y	eastern Coachella Valley lacks adequate flood control		
Are wildfires a concern in parts of your region?	N	Not applicable	Increases in flash flooding	N/A
Does part of your region lie within the Sacramento-San Joaquin Drainage District?	N	Not applicable	Not applicable	N/A



Vulnerability	Y/N	Justification	Vulnerability Issue	Tier
Ecosystem and Habitat				
Does your region include inland or coastal aquatic habitats vulnerable to erosion and sedimentation issues?	Y	Considered low threat, because watershed erosion and sediment management are not key issues due to the engineered and maintained nature of waterways; however, pup fish exist in open agricultural drains.	Increased impacts to water dependent species	Low
Does your region include estuarine habitats which rely on seasonal freshwater flow patterns?	N	Not on coast.		
Do climate-sensitive fauna or flora populations live in your region?	Y	Desert pupfish living in agricultural drains and flood control channels		
Do estuaries, coastal dunes, wetlands, marshes, or exposed beaches exist in your region? If so, are coastal storms possible/frequent in your region?	N	Not applicable	Decrease in habitat protection against coastal storms	N/A
Do endangered or threatened species exist in your region? Are changes in species distribution already being observed in parts of your region?	Y	Wetlands near the Salton Sea are a part of the Coachella Valley MSHCP	Decrease in available necessary habitat	Low
Does the region rely on aquatic or water-dependent habitats for recreation or other economic activities?	N	Not applicable		
Are there areas of fragmented estuarine, aquatic, or wetland wildlife habitat within your region? Are there movement corridors for species to naturally migrate? Are there infrastructure projects planned that might preclude species movement?	Y	Wetlands near the Salton Sea are a part of the Coachella Valley MSHCP		



Vulnerability	Y/N	Justification	Vulnerability Issue	Tier
Does your region include one or more of the habitats described in the Endangered Species Coalition's Top 10 habitats vulnerable to climate change?	Y	The "Southwest Deserts" identified on the top 10 list includes the Sonoran Desert.		
Are there rivers in your region with quantified environmental flow requirements or known water quality/quantity stressors to aquatic life?	N	Not applicable	Decrease in environmental flows	N/A
Hydropower				
Is hydropower a source of electricity in your region?	Y	Hydropower is used in the Region as a source of electricity from the Imperial Irrigation District	Reduction in hydropower generation potential	Low
Are energy needs in your region expected to increase in the future? If so, are there future plans for hydropower generation facilities or conditions for hydropower generation in your region?	Y	Hydropower use is currently low and there are no concrete future plans to expand its use		Low

3.2.3 Vulnerability Analysis

Once the Region's climate change issues were identified, it was examined the adaptability of its water resources to climate change by prioritizing the vulnerability issues. In prioritizing the vulnerability issues, the Region identified those water resources that are of highest concern because of the significance of the impact of climate change, and from there identify the level of adaptation that will be needed.

Vulnerability Prioritization

The identified vulnerabilities were prioritized by considering the unique aspects of the Region. Prioritized vulnerabilities were vetted at the December 13, 2012 Planning Partners meeting and are shown in **Table 3-5**. Those vulnerability issues determined to be high priority are discussed further below.

Table 3-5: Prioritized Climate Change Vulnerability Issues

Priority Level	Category and Vulnerability Issue
High	• Water Demand: Crop water demand would increase • Water Supply: Decrease in imported supply • Flooding: Increases in inland flooding
Medium	• Water Demand: Lack of groundwater storage to buffer drought • Water Demand: Limited ability to conserve further • Water Demand: Limited ability to meet summer demand • Water Supply: Invasive species can reduce the supply available
Low	• Water Demand: Industrial demand would increase • Water Supply: Decrease in local surface supply • Water Supply: Decrease in groundwater supply • Water Quality: Increased erosion and sedimentation due to wildfires • Ecosystem and Habitat: Increased impacts to water dependent species • Decrease in available necessary habitat

Water Demand: Crop Water Demand Would Increase

Crop water demands are expected to increase with the increased temperatures caused by climate change. Given that agriculture is an important industry in the Region, an increase in crop irrigation demands caused by higher temperatures could impact the Region's economy through increased supply costs.

Water Supply: Decrease in Imported Supply

The water supply vulnerability issue of "decrease in imported supply" was identified by the Region as a high priority issue due to its dependency on imported water from the State Water Project and from the Colorado River. Given the Region's limited local water supplies, a decrease in imported supply with climate change could have a significant impact on the Region and is an issue that needs to be addressed.



According to water rights secured by a series of interstate compacts and federal legislation known as the *Law of the River*, Colorado River water supplies for the Coachella Valley are considered relatively secure even considering climate change vulnerabilities. However, according to the published State Water Project Delivery Reliability Reports, it is projected that the average reliability of SWP Table A deliveries (refer to *Chapter 2 Region Description* for more information) will be 60% of the Table A allotted value through 2029 after taking into consideration the potential effects of climate change (CVWD 2012). SWP deliveries are likely to impacted by variations in streamflow and runoff due to increased precipitation variation and decreases in snowpack due to increased temperature. Additionally, the Sacramento-San Joaquin River Delta, an important source of water for the SWP, will likely be impacted by sea level rise. Due to climate change and other factors, the 2010 Coachella Valley WMP assumes a long-term future average reliability of SWP supplies to be 50% of the Region's Table A allocations.

Flooding: Increases in Inland Flooding

Inland flooding was listed as a high priority for the Region, given that some of the Region's critical water infrastructure exists in the 200-year flood plain, and that the eastern Coachella Valley has experienced flooding in the past. More extreme storms due to climate change could cause an increase in inland flooding in the future.

3.3 Technical Analysis

*This section addresses with **Technical Analysis Standard** by documenting that the IRWM/SWR Plan is based on sound technical information, analyses, and methods.*

This section identifies the scientific and technical analysis used in development of the Coachella Valley IRWM/SWR Plan. Published documents such as regional plans, studies, and technical reports were reviewed, experts were consulted, and meetings with various interest groups were held to understand the short term and long-range needs of the Coachella Valley.

The documents referenced in *Chapter 2 Region Description*, *Chapter 3 Issues and Needs*, and *Chapter 12 References* of the Coachella Valley IRWM/SWR Plan were reviewed by the CVRWMG and the consulting team for the 2014 IRWM Plan Update (RMC and IPM, Inc). As a partnership of the five Coachella Valley water purveyors and one wastewater agency, the CVRWMG includes a wide variety of water professionals with different water-related backgrounds. The variety of backgrounds of the CVRWMG members and the consulting team allowed the information to be evaluated, analyzed, and interpreted from many different perspectives.

To better understand the water management needs of the Coachella Valley, the CVRWMG also held meetings with various interest groups, which are described in further detail in *Chapter 7 Stakeholder Involvement*:

- Coachella Valley Planning Partners are a group formed at the request of the CVRWMG consisting of representatives from public and non-profit entities that have an interest in water resources of the Region. The Planning Partners support the CVRWMG by reviewing and contributing to draft issues identification, goals and objectives, project prioritization criteria, long-term governance, implementation framework, and other IRWM/SWR Plan deliverables.
- Disadvantaged Community representatives within the Coachella Valley; DAC representatives were also invited to become Planning Partners. These meetings allowed the CVRWMG to understand



the critical water supply/water quality issues and needs of the DACs; and to identify potential solutions.

- The Coachella Valley's tribal governments, Bureau of Indian Affairs, and other tribal coordinating agencies were contacted to better understand their critical water resources issues and needs. The CVRWMG learned more about the major water-related concerns facing the tribes such that the long-term implementation of the IRWM/SWR Plan was responsive to those needs.
- Other Coachella Valley stakeholders were also identified. These meetings consisted of individual community members concerned with water resources, and representatives from various community groups that are concerned about water resources. The CVRWMG gathered input from the stakeholders about the community priorities and water related concerns.

The information gathered from the pertinent literature, water resource experts, and various interest groups was compiled and analyzed by the CVRWMG and the consulting team to determine the water management needs of the Coachella Valley. This work focused on identifying the key water resource goals and objectives of the IRWM/SWR Plan area (see *Chapter 6 Objectives*). The CVRWMG and its consulting team then used the information to prepare the Coachella Valley IRWM/SWR Plan.

3.3.1 Technical Information

The IRWM/SWR Plan goals were determined through review of pertinent literature, and consultation of various experts and interest groups. The CVRWMG undertook an extensive review of regional plans, studies, and technical reports to identify water management issues facing the Coachella Valley. Each section of the above *Section 3.1 Coachella Valley Issues and Needs* contains a summary of issues statement and pertinent literature used to derive the issues statement. This summary provides a snapshot of the studies, models, and other technical methodologies used to analyze the technical information and data sets. **Appendix VI-B** contains more detailed information regarding the technical analyses included in the plans and studies used to inform the development of the 2018 IRWM/SWR Plan. This appendix is consistent with Table 6 – Possible Studies/Data Sets provided in the *2016 IRWM Program Guidelines* by DWR.

Information was obtained from a broad range of sources, including: CVWD, CWA, DWA, MSWD, IWA, Coachella Valley Association of Governments (CVAG), DWR, Rural Community Assistance Corporation (RCAC), Poder Popular, RCFCWCD, County of Riverside, Colorado River Regional Water Quality Control Board (RWQCB), and the Desert Recreation District. Plans and reports included: water management plans, water quality reports, engineer's reports, habitat conservation plans, general plans, groundwater replenishment reports, master plans, feasibility studies, system assessments, stormwater management plans, and trails studies. *Chapter 12 References* provides a comprehensive list of the resources used to develop this IRWM/SWR Plan. Use of these technical resources is appropriate for development of the IRWM/SWR Plan, because it represents historic, current, and projected conditions for all service providers within the Coachella Valley.

IRWM Project Selection Process Form

This Form is applicable to any IRWM Region within a Cooperative Funding Area that chooses their Application to be not scored as per Table 4 in the PSP. This Form will be used to ensure an appropriate process was followed to select projects for Proposition 1 IRWM Implementation Round 2 that includes all criteria required by Proposition 1 for project eligibility and preferences. The completed form should not exceed three pages.

1. Please describe the criteria used to select IRWM projects. Selection criteria must include the preferences required by Proposition 1:
    - Projects that leverage funding
    - Projects that achieve multiple benefits shall receive special consideration
    - Special consideration will be given to projects that employ new or innovative technology or practices, including decision support tools that support the integration of multiple jurisdictions, including, but not limited to, water supply, flood control, land use, and sanitation
    - Projects that help address the impacts caused by nitrate, arsenic, perchlorate, or hexavalent chromium contamination, including projects that provide safe drinking water to small disadvantaged communities

    The Coachella Valley Regional Water Management Group (CVRWMG) also applied the following local selection criteria that was developed through a consensus process in 2010:

    - Addresses multiple IRWM plan objectives
    - Integrates multiple resource management strategies
    - Addresses Statewide Priorities
    - Linked to other projects
    - Involves more than one partner
    - Optimizes water supply reliability
    - Protects or improves water quality
    - Manages flood risk
    - Optimizes conjunctive use of surface and groundwater supplies
    - Directly benefits disadvantaged communities
    - Maximizes stakeholder involvement and stewardship in water resource management
    - Identified in existing plan

    Along with the local selection criteria, the CVRWMG applied the criteria required by Proposition 1 during the selection process described in Question 2. During the selection process, the CVRWMG and the Planning Partners stakeholder group discussed how projects leveraged funding, achieved multiple benefits, and addressed impacts caused by nitrate, arsenic, perchlorate, or hexavalent chromium contamination.

2. IRWM Regions must use a competitive process to select projects for Round 2. How were the selection criteria in Question 1 applied to the project selection process? Please describe if any of the criteria was weighted differently, if applicable.

    The Coachella Valley IRWM Region's project selection process involves three major steps: 1) solicitation, 2) prioritization, and 3) selection.

    <u>Solicitation</u>
    The CVRWMG opened a Call for Projects from March 9, 2022 to May 20, 2022. Notices for the Call for Projects were distributed via email and posted onto CVRWMG.org. The CVRWMG offered assistance with project submission and shared an instructional video about the process

online. Local project sponsors (LPSs) submitted projects to the Online Project Tracking and Integration (OPTI) database, which was developed to assist in the management of project information. Through OPTI, LPSs can enter and edit their project information and view other submitted projects at any time. At minimum, each LPS provided basic information about their project, which included a project description, contribution to the 2018 Coachella Valley Integrated Regional Water Management/Stormwater Resource Plan's (IRWM/SWR Plan's) objectives, contribution to resource management strategies, water-related benefits, estimated project costs, status, and details. CVRWMG representatives were aware of potential local projects that had not been submitted and contacted potential LPS's to ask if they planned to submit and/or needed assistance.

Prioritization

Following the solicitation period, projects were reviewed, scored, and ranked. Projects were first screened for eligibility to ensure they met all criteria.

Projects were then scored and ranked by an independent third-party using the local scoring criteria (see Chapter 9 of the 2018 Coachella Valley IRWM/SWR Plan in **Appendix 7-1**). This local project scoring criteria has three fundamental components: 1) Principles of IRWM Planning, 2) Priorities of the Coachella Valley Region, and 3) Project Feasibility. Each component has a set of criteria that has different weighting based on stakeholder input during the 2010 project selection and scoring criteria, the 2014 Coachella Valley IRWM Plan update, and the 2018 Coachella Valley IRWM/SWR Plan update (See Project Scoring Guide at CVRWMG.org).

Each project was assigned a score for each criterion for a maximum score of 200 points by the third-party scorer. Projects were then ranked with the highest-scoring project ranked by number one. In prior funding rounds, projects were tiered with the top 50th percentile of projects tiered in in Tier 1 and further considered for IRWM Funding. Projects were not tiered in this round because so few (six) projects were submitted. Following project scoring and ranking, the CVRWMG conducted a review of the scores to conduct a quality control assessment of the scoring.

Selection

Since the establishment of the CVRWMG, the group has enlisted the recommendations of a stakeholder group called the Planning Partners. The Planning Partners group includes local water and wastewater agencies, non-governmental organizations, tribal representatives, and other agencies. Participation is open to any stakeholders who want to participate. To ensure agencies and organizations are represented, the CVRWMG cross referenced the Planning Partners list with other stakeholder processes in the area and developed a more updated distribution list, which was then used to provide information, offer assistance, and send meeting invitations.

The CVRWMG sent an invitation to the entire distribution list for Planning Partners to participate in project selection. Those who confirmed their attendance were sent thank you emails, and those who did not respond but have previously participated in the process, were contacted individually and asked if they were able to send another representative from their organization to attend.

During the Project Selection Meeting, each public agency, non-government organization and municipality received one vote, even if multiple representatives attended. The voting criteria were based on the criteria listed in Question 1 and local priorities identified in the 2018 Coachella Valley IRWM/SWR Plan. Following a presentation on process and priorities, the group reviewed the projects based on criteria. The group then moved into discussion about each individual project.

The Planning Partners group prioritized projects that had all CEQA, NEPA, and permitting completed within 12 months of the award date and gave preference to the selection criteria referenced in Question 1. The group voted to partially fund all six submitted projects. Following the meeting, each LPS and the entire Planning Partners email distribution list were notified about the decision.

The final Proposal Solicitation Package indicates that if an awarded project fails to meet the requirements or fails to progress in a timely fashion, the Department of Water Resources may remove the project from the grant agreement and allow a replacement project. The replacement project must be included on the list of vetted and ranked projects. The Coachella Valley IRWM Region does not have a list of replacement projects since the CVRWMG and the Planning Partners group agreed to partially fund all six projects. If the Department of Water Resources removes a project from the agreement, the CVRWMG will reallocate the funding to the other five projects.

3. Did the project selection process comply with the process included in the adopted IRWM Plan? If not, please explain.

   Yes, the project selection process complied with the process included in the 2018 Coachella Valley IRWM/SWR Plan. Project selection and scoring process is described in Chapter 9 of the IRWM/SWR Plan (see **Appendix 7-1**).

4. Were all conflict-of-interest laws and policies followed in this selection process as outlined in the draft Grant Agreement Paragraph D.12?
   ☒ Yes ☐ No

I understand that the Department of Water Resources will rely on this signed certification in order to accept application for funding and that false and/or inaccurate representations in this Self-Certification may result in revocation of the award of funds or loss of all funds awarded to the Grantee.

Name of the IRWM Region: Coachella Valley

Ivory Reyburn	I. Reyburn
Name of Authorized Representative	Signature
Water Resources Supervisor	08/18/2021
Title	Date



9 Project Evaluation and Prioritization

Integrated Regional Water Management (IRWM) Standards*: This chapter addresses the* ***Project Selection Process Standard*** *which ensures the process used for submitting, reviewing, and selecting projects is documented and understandable for regional stakeholders and the public.*

Stormwater Resource Plan (SWRP) Requirements: *This chapter describes the* ***Quantitative Methods*** *used assess the multiple benefits of stormwater project in the planning area, as well as describes the* ***Identification and Prioritization of Multiple Benefit Projects*** *according to the SWRP requirements.*

In order to develop and identify water resources management projects for implementation, the Coachella Valley Regional Water Management Group (CVRWMG) has provided technical support and outreach to project proponents and has released several open "Call for Projects" for consideration in the IRWM/Stormwater Resource (SWR) Plan and grant applications. Organizations from across the Coachella Valley IRWM Region (Region) submitted projects addressing a wide variety of water supply, water quality, flood management, and habitat protection needs. In 2018, 40 additional projects were submitted to the database to address local water resources issues, including 23 stormwater projects and 40 IRWM projects. This brings the overall total number of project submissions to 115 projects. While all of these projects are considered to be important to effectively manage water resources in the Region, a prioritization process has been established for IRWM and a ranking process for stormwater projects to help manage the project list and to determine which projects best meet regional needs. The prioritization processes will allow a ranking of projects for implementation using a transparent and defensible method and will encourage the development of projects that are best suited for meeting the identified needs of the Coachella Valley. Although stormwater projects are ranked per California Water Code requirements, project ranking does not determine whether that project can move forward to be considered for funding as it does with the IRWM prioritization process. These separate prioritization and ranking processes are further described in the sections below.

9.1 IRWM Regional Priorities

As described in *Chapter 6 Objectives*, the following regional goals and objectives are priorities for implementation in the Coachella Valley:

- Optimize Water Supply Reliability (Corresponding to Goal 1, including Objectives A-D)
- Protect or Improve Water Quality (Corresponding to Goal 2, including Objective E-F)
- Manage Flood Risks (Objective H)
- Optimize Conjunctive Use of Surface and Groundwater Supplies (Objective I)
- Directly Benefit Disadvantaged Communities (Objective L)

Implementation priorities are those actions necessary to address immediate areas of need that have been identified through CVRWMG and Planning Partner meetings and public workshops. Meeting these priorities will continue to move implementation of the IRWM/SWR Plan forward and ensure that the IRWM/SWR Plan is representative of the Region's needs and responsive to key regional issues. The CVRWMG, with Planning Partners guidance, will be responsible for IRWM/SWR Plan implementation responsibilities.

In September 2010, the CVRWMG and Planning Partners identified seven short-term priorities for the Coachella Valley IRWM Program. These short-term priorities were intended to direct the activities of the local IRWM Program. These implementation actions will move the Region toward more sustainable water management and will help the CVRWMG fully characterize and address critical water management needs.

Near-term IRWM/SWR Plan implementation will focus on the regional priorities identified through this facilitated consensus-based process. These regional priorities provide an overall direction for the IRWM Program and will continue to be addressed through planning and implementation projects or other program activities.

Priority 1: Address Water Quality in DACs

During the issues identification process with regional stakeholders, critical drinking water quality issues were raised by eastern Coachella Valley disadvantaged communities (DACs). The CVRWMG is committed to developing a more thorough understanding of and identifying solutions for the groundwater quality issues in the Region's DACs. Preparation of the *DAC Groundwater Quality Study*, as part of the previous 2014 IRWM Plan Update (refer to *Chapter 10 Agency Coordination* for more information), included a technical evaluation to begin exploring these issues right away. Tackling this critical need head-on helps to address two of the California Department of Water Resources' (DWR's) Statewide Priorities: "Protect Surface Water and Groundwater Quality" and "Ensure Equitable Distribution of Benefits".

The Region's *Proposition 84-Round 1 Implementation Grant* funded a short-term arsenic treatment project to ensure that known mobile home communities who currently experience arsenic contamination are provided clean, safe drinking water as soon as possible. The Region's *Proposition 84-Round 2 Implementation Grant Proposal* included planning and design support for extension of municipal water supplies to an economically disadvantaged tribal community in the eastern Coachella Valley. The Region's *Proposition 84-Round 4 Implementation Grant* funded a septic-to-sewer project for an economically disadvantaged tribal community in the eastern Coachella Valley that would provide a long-term, permanent solution to the existing offsite *E. coli* water quality issues associated with the ponding of untreated water from failing septic systems. The Region's *Proposition 1- Disadvantages Community Involvement (DACI) Grant funded* planning and design support for a chromium-6 treatment design project within in the City of Coachella to provide clean, safe drinking water within its service area.

Priority 2: Manage Flood Risk

Due to the Coachella Valley's susceptibility to flash flooding, the CVRWMG is committed to identifying and improving regional participation in flood protection programs. Preparation of the *Integrated Flood Management Study*, as part of the previous 2014 IRWM Plan Update (refer to *Chapter 10 Agency Coordination* for more information), specifically addressed local flooding risks. This planning effort addressed emergency preparedness, flood protection, floodplain ecosystems, and low impact development techniques that comprise DWR's Statewide Priority "Practice Integrated Flood Management".

Priority 3: Improve Relationships with Tribes

Establishing new relationships between the IRWM Program and local tribes is intended to improve regional groundwater management. As demonstrated by the extensive one-on-one outreach conducted to Native American tribes by the IRWM Program, the CVRWMG is committed to using the IRWM Program as a forum for coordination and collaboration with the Coachella Valley's tribes. Through this forum, the CVRWMG has also coordinated with the local tribes to provide information on the Stormwater Grant Program (SWGP). This consultation will help the Region attain DWR's Statewide Priority "Improve Tribal Water and Natural Resources". For more information about IRWM/SWR coordination with Native American Tribes, refer to *Chapter 5 Tribal Water Resources.*

Priority 4: Address Emerging Regulations

Changes in the regulatory environment – including the passage of Assembly Bill 1420 (AB 1420) in 2017and Senate Bill X7-6 (SBX7-6) in 2009, Senate Bill 985 (SB 985), the State Board's Recycled Water Policy in 2009, ongoing Total Maximum Daily Load (TMDL) efforts, Sustainable Groundwater Management Act (SGMA) in 2014, and Stormwater Resource Planning Act in 2014– have and will affect water management activities of the CVRWMG. The CVRWMG is committed to working together to address common interests and solutions to these new regulations. The previous 2014 IRWM Plan Update included development of a planning strategy for the Salt and Nutrient Management Plans (SNMPs) required by the Recycled Water Policy. The SNMP Workplan is included as **Appendix VI-G** and was used to solicit a consultant for preparation of the plan. The SNMP was completed by Coachella Valley Water District (CVWD), Desert Water Agency (DWA), and Indio Water Authority (IWA) in June 2015. DWR's Statewide Priority "Protection Surface Water and Groundwater Quality" specifically promotes salt and nutrient planning as a component of an IRWM Plan. Task 2-4 in the *Proposition 84 Planning Grant Proposal* included development of a monitoring strategy for Groundwater Elevation Monitoring in compliance with SBX7-6 as well as an analysis of groundwater strategies that could be implemented to meet regional needs pertaining to groundwater management (refer to *Chapter 10 Agency Coordination* for more information).

The 2014 SGMA required the formation of Groundwater Sustainability Agencies (GSAs) by June 30, 2017 in medium- and high-priority basins, as designated by DWR, and to develop Groundwater Sustainability Plans (GSPs). The GSA is responsible for developing and implementing a GSP to meet sustainability goals of the basin to ensure that it is operated within its sustainable yield, without causing undesirable results. CVWD, CWA, DWA, IWA and MSWD submitted application materials to become GSAs for different subbasins of the Coachella Valley Groundwater Basin (see **Figure 10-2** in *Chapter 10 Agency Coordination*).

The Stormwater Resource Planning Act requires the development of a SWRP as a condition of receiving funds for stormwater or dry weather runoff projects from any bond approved by voters after January 2014, which includes Proposition 1. This IRWM/SWR Plan serves as a SWRP functional equivalent to satisfy this requirement.

Priority 5: Encourage Septic to Sewer Conversion

Because of the potential impact that septic systems may have on groundwater quality in the Coachella Valley, the CVRWMG is committed to implementing septic-to-sewer conversion projects through the IRWM Program. Various conversion projects throughout the Coachella Valley may be coordinated under a larger, more efficient program to address DWR's Statewide Priority "Protect Surface and Groundwater Quality". The Region's *Proposition 84-Round 1 Implementation Grant* funded several septic-to-sewer

projects that address critical groundwater quality issues related to nitrate contamination. The *Proposition 84-Round 2 and Round 4 Implementation Grant Proposals* each included two septic-to-sewer conversion projects to protect groundwater quality and public health and safety three in the eastern Coachella Valley and one in the western Coachella Valley.

Priority 6: Address Reduced Reliability

Developing a better understanding of the State's State Water Project (SWP) Allotment priorities and issues affecting reliability will help the Region coordinate its efforts and resources towards improving future supply reliability. In the meantime, the CVRWMG is committed to encouraging water conservation and source substitution projects to reduce additional future demand on the imported water supply. For example, the CVRWMG recognizes the importance of expanding the Region's recycled water systems to offset potable water demand. With this emphasis on water conservation and recycling, the CVRWMG will implement DWR's Statewide Priority "Drought Preparedness" within the Coachella Valley. The Region's *Proposition 84-Round 1 Implementation Grant* funded a regional water conservation program to address the potential for reduced reliability and to achieve compliance with the State's 20x2020 Plan. The Region's *Proposition 84-Round 2 Implementation Grant Proposal* included expansion of the Coachella Valley's non-potable water distribution system. The Region's *Proposition 84-Round 3 (Drought Round) Implementation Grant* funded the Regional Turf Reduction Program to reduce irrigation demands for turf grass. The Region's *Proposition 84-Round 4 Implementation Grant Proposal* included additional funding for the Regional Turf Reduction Program and the IWA Recycled Water Project, which further offload demand for imported water and increase local supply reliability.

Priority 7: Create the Data Management System

The CVRWMG created a Data Management System (DMS) that will help to manage water resources data and project performance through the IRWM Program website (www.cvrwmg.org) and online project database to provide links to publicly available datasets and water-related resources for the Region's stakeholders. Refer to *Chapter 11 Framework for Implementation, Section 11.3 Data Management* for additional detail on the proposed DMS. An additional DMS or modifications to the existing DMS that incorporates water-related information through a different format than the current DMS has been recommended as a potential IRWM project and is currently included within the online project database. This potential project has not historically scored well within the Region's stakeholder-vetted project scoring process (see below for more information) but will continue to be considered as a potential IRWM project for future implementation.

Implementation of these priorities will help to ensure that IRWM/SWR Plan implementation proceeds in a coordinated manner, the benefits of IRWM/SWR Plan implementation extend throughout the entire Region, and the Region makes inroads toward achieving the goals of this IRWM/SWR Plan.

9.2 IRWM Project Selection Process

This section describes the IRWM Project Selection Process, which includes three components per the 2016 IRWM Guidelines: procedures for submitting a project to the IRWM/SWR Plan; procedures for review of projects to implement the IRWM/SWR Plan; and procedures for communicating the list(s) of selected projects.

Throughout the IRWM/SWR planning process, the CVRWMG has engaged stakeholders across multiple areas of water resources management to identify priorities for the Region and to prioritize projects for implementation. As described below, the Planning Partners played an integral role in reviewing and selecting projects that best achieve the regional goals and objectives. This section presents the process for prioritization and selection of IRWM projects, including:

- Procedures for submitting projects to the IRWM/SWR Plan,
- Process by which CVRWMG provides technical support to interested parties,
- Procedures for reviewing and prioritizing projects submitted to the IRWM/SWR Plan, and
- Procedures for selecting and communicating the final IRWM project list.

9.2.1 Project Submittal Process

The CVRWMG and Planning Partners originally developed the project submittal process in May 2010. This process involves three major steps: solicitation, prioritization, and selection. Solicitation can be described as a "Call for Projects" that helps to meet the Region's established goals and objectives. The objective of this step is to compile a comprehensive list of water-related projects for the Region that meets the issues, needs, and objectives identified in the IRWM/SWR Plan or by local stakeholders. Any individual(s) that represent a public agency or non-profit organization with common water interests and needs can submit a project to the IRWM Program or the SWGP via the IRWM website (www.cvrwmg.org). An online project database was developed to assist in the management of project information (http://irwm.rmcwater.com/cv/. The database provides stakeholders with access to project information based on username/login functionality. Stakeholders can access the online project database from the project website, enter and edit their project information, and submit the projects for consideration in the IRWM/SWR Plan.

At a minimum, each project submitter must provide basic information about their project, including a project description, contribution to IRWM/SWR objectives (refer to *Chapter 6 Objectives*), contribution to identified Resource Management Strategies (refer to *Chapter 8 Resource Management Strategies*) water-related benefits, estimated costs, status, and project details. The project submitter also marks whether the project is being submitted as a SWRP project and/or an IRWM project. Those projects being submitted to the SWRP have additional information to fill out as described in *Section 9.5.2 Stormwater Multiple Benefits and Associated Metrics*. The IRWM/SWR project database allows this project information to be reviewed, organized, and regularly updated by the CVRWMG and project proponents. Access to project summaries is available to all interested parties with the intention of improving transparency. **Figure 9-1** includes screenshots of the CVRWMG projects website and the online project database. Because the project database is an online web tool, interested parties can view projects and find out information about projects that were submitted to the online database at any time; projects that are included in the IRWM/SWR project database are not managed or deleted by the CVRWMG, but rather will remain in the online database until edited or removed by project sponsors.

Figure 9-1: CVRWMG Website and Project Database



The CVRWMG sends announcements to invite stakeholders to Planning Partners meetings to conduct regional coordination and to prepare for project solicitation periods and upcoming grant applications. During these meetings, the CVRWMG partners extended an offer to all project submitters to assist with input of their projects. Such assistance included technical assistance with project development and review of required project selection criteria as well as technical assistance necessary to properly enter projects into the online project database.

An open house is held for DAC representatives and other interested stakeholders during each project solicitation, with computers available to help project proponents in entering project information into the database. The open houses were held on July 28, 2010 and October 11, 2012 for Rounds 1 and 2 of Proposition 84 Implementation Grant project solicitation, respectively. The open houses are intended to be a working session with CVRWMG members helping the DAC representatives to understand and complete

the online form. Access to the online project submittal forms can also be made available to those who do not have computer access. In addition, the CVRWMG may provide technical support to DAC and other representatives who are unable to develop project materials on their own, in order to assist entities in submitting thorough project information.

Notices announcing the "Call for Projects" and the open houses are sent via email, advertisements on the website, and other media sources in order to reach all possible interested parties. A deadline for project submittals is established up front and made widely available to stakeholders, in order to receive, screen, and rank all projects for inclusion within the IRWM/SWR Plan. The deadline was set for July 2010, October 2012, June 2014, and May 2016 for Proposition 84-Rounds 1, 2, 3, and 4, respectively.

For the Proposition 1-Round 1 Implementation Grant process (anticipated in late 2018, early 2019) the CVRWMG will coordinate with the Riverside County Department of Environmental Health (DEH), the Regional Water Quality Control Board (RWQCB), and other applicable regulatory agencies, as well as the Planning Partners, to send notices of the "Call for Projects" to applicable parties that can potentially submit projects that will address critical water quality and wastewater needs of DACs. Such parties may include mobile home park owners or residents with known drinking water quality issues (drinking water quality that does not meet regulatory standards), or those that have been cited for significant wastewater (septic) issues. Further, for the Colorado River Funding Area (CRFA) DAC Needs Assessment development process, the CVRWMG will re-send the findings from the DAC Outreach Program projects (refer to *Chapter 4 Disadvantaged Communities* for more information) to all IRWM stakeholders. The project findings include example work plans, budgets, and schedules for onsite drinking water treatment and septic system rehabilitation projects and provide a necessary first-step for potential DAC project proponents to develop projects that will potentially be viable for Proposition 1 funding. The DAC Outreach Program will serve as a starting point for development of the CRFA DAC Needs Assessment, which is anticipated to be complete in December 2020.

In order to facilitate review and organization of the project submittals, the IRWM/SWR project database provides the option of printing or exporting a detailed list of all projects submitted. The CVRWMG uses this project list in discussions of submitted projects with the Planning Partners and other stakeholders.

The online project database is open at all times for receipt of new implementation projects as well as editing and revision of current implementation projects. As new funding opportunities arise, the CVRWMG will issue a new "Call for Projects" with a deadline appropriate for that funding application. Project concepts, ideas, and/or needs were accepted into the project submission process in order to identify needs within the Region; however, these types of submittals were not considered for IRWM-related grant funding.

9.2.2 IRWM Project Review and Prioritization Process

After the solicitation deadline, IRWM projects submitted through the open "Call for Projects" are reviewed, ranked, and prioritized using a two-step screening and scoring approach. **Figure 9-2** below illustrates the overall process for screening of projects for the IRWM Program.

As shown in this **Figure 9-2,** projects are first evaluated for consistency with the regional objectives. Projects that do not meet any regional objectives were excluded from the IRWM/SWR Plan. Projects that are found to meet at least one objective pass the screening process and are moved on to the next step of the project review process: scoring and ranking.

To evaluate and prioritize projects as part of the IRWM planning process, the scoring and ranking process takes into account three fundamental components:

- Principles of IRWM planning,
- Priorities of the Region,
- Feasibility of projects to proceed.

The relative priority of each criterion is established by its ability to contribute to the overall goals and objectives established for the Region as illustrated in **Table 9-1**. Scoring for each submitted project is based on the responses provided in the online project database. In addition, the CVRWMG has a third-party (consultant) review each project individually for accuracy before they are ranked within the online project database. This ensures that appropriate credit is taken for contribution to regional goals and objectives, as well as other scoring criteria.

Figure 9-2: Prioritization Process Overview



Through a consensus process conducted in 2010, the CVRWMG and Planning Partners established the relative importance of each of these criteria. The approach to scoring projects and the relative importance of each criterion is presented in **Table 9-2.** In 2013, additional input was solicited from the Planning Partners to determine if the objective prioritization determined in 2010 was still applicable given changes that have occurred since 2010. That process, explained in detail in *Chapter 6 Objectives,* resulted in the addition of one criterion to the project scoring process (maximizes stakeholder involvement and stewardship in water resource management). The objective prioritization was not revised during this 2018 IRWM/SWR Plan Update.

Based on stakeholder input from 2010 and 2013, project scoring was developed to identify projects that:

- Address multiple IRWM Plan objectives,
- Integrate multiple resource management strategies,
- Address a Statewide Priority,
- Link to other projects,



- Involve more than one partner,
- Optimize water supply reliability,
- Protect or improve water quality,
- Manage flood risks,
- Optimize conjunctive use of surface and groundwater supplies,
- Directly benefit disadvantaged communities,
- Maximize stakeholder involvement and stewardship in water resource management, and
- Are identified in existing plans.

Each project is evaluated with respect to the criteria presented in **Table 9-2.** Based on the outcome of this evaluation, each project is assigned a score for each criterion for a total maximum score of 200. Projects are then ranked with the highest-scoring project ranked by number one. The top 50th percentile of projects (i.e., all project above the median) are considered Tier 1 projects that strongly contribute to the attainment of regional goals and objectives. Further, all future phases of Tier 1 projects are considered Tier 1A, such that only the ready-to-proceed Tier 1 projects are identified as regional priorities. The bottom 50th percentile (i.e., all projects below the median) are considered Tier 2 projects that are necessary to manage water in the Region, but not considered priorities under IRWM planning.

Tier 1 IRWM projects listed within the online project database will be moved forward for consideration in various IRWM funding applications.

Following project scoring and ranking, the CVRWMG conducts a review of the complete list of submitted projects and scores to facilitate the pairing of similar projects to fulfill the integration requirements of the IRWM/SWR Plan (please see *Chapter 8 Resource Management Strategies, Section 8.1 IRWM/ Stormwater Integration Approach* for a more detailed explanation of integration). The CVRWMG agrees that project integration and selection should occur with near-term regional and agency-wide benefits in mind. The focus of this IRWM/SWR Plan is to identify and address immediate needs that benefit the Coachella Valley.

After much discussion, several integration opportunities among the submitted projects are generally identified. The opportunities for greater project efficiencies are highlighted and communicated back to the project sponsors. The CVRWMG notes that not all prioritized projects will be regional in scope; solutions could entail grouping projects into ‘packages’ or prioritizing individual projects based on critical water supply or water quality needs. Integration suggestions made by the six CVRWMG agencies at the meeting are transmitted to the project proponents for consideration.

The CVRWMG then identifies a “short list” of top ranked projects from the complete Tier 1 list to be further considered and assessed. Those project sponsors are invited to join the CVRWMG for an informal “interview” where they describe their project and its benefits to the Region, as well as answer any questions from the CVRWMG that arose during the project scoring and ranking process. This interview step was added into the project selection process during the Proposition 84-Round 2 solicitation in 2012, so that the selection decision was based on better information than simply the online forms. The interviews for the Rounds 2, 3, and 4 cycles were held on December 6, 2012, June 10, 2014, and June 4, 2015, respectively. The primary purpose of the interview process is to assess each top tier project for feasibility, benefit/cost ratios, and other factors in accordance with stipulations set forth by DWR in the various Proposal Solicitation Packages (grant application requirements) that were released for each round of Proposition 84 IRWM funding and will be released for the two Proposition 1 IRWM implementation rounds. Projects are evaluated in accordance with the Proposal Solicitation Package requirements, because the Region is within



a competitive IRWM Funding Area (the CRFA). Due to competition within the CRFA, the grant proposal packages that the Region submits to DWR are scored and compared against proposal packages from other IRWM regions. The competitive grant process requires the Region to submit grant proposals that are robust and contain projects that are highly feasible, have strong cost-benefit ratios, and will likely score well within DWR's established grant scoring process.

Stakeholder Input

Stakeholders have the ability to provide input and feedback on projects through the online project database, during project review sessions, at Planning Partners meetings, and through participation in project selection workgroups. The project selection process for Proposition 84-Round 1 funding was finalized at public meetings of the Planning Partners held on September 28, 2010 and October 26, 2010, and the projects for Proposition 84-Rounds 2, 3, and 4 were approved by the Planning Partners on December 13, 2012, June 12, 2014, and June 11, 2015, respectively. For the Round 1 Proposition 1 Implementation Grant process (anticipated in late 2018) the Planning Partners will be asked to provide input on the existing project selection and review processes. Specifically, the Planning Partners will be asked to provide direction and a recommendation on Planning Partner involvement in the project scoring and interview processes.

During Rounds 1, 2, 3, and 4 of Proposition 84 Implementation Grant funding stakeholders that submitted projects were also involved in that they could request feedback from the CVRWMG regarding improvements or revisions that could be made to potentially assist them in future rounds of grant funding. The CVRWMG commits to honoring this process in of the next Proposition 1 Implementation Grant funding rounds and will provide feedback to interested parties on how to improve projects for competitiveness or provide information to project sponsors about why their projects were not selected.



Table 9-1: Project Prioritization Criteria and Relationship to IRWM Goals and Objectives

Goals	Objectives	DWR IRWM Principles					Priorities of the Coachella Valley						Feasibility
		Addresses Multiple IRWM Plan Objectives	Integrates Multiple Resource Management Strategies	Addresses a Statewide Priority[1]	Linked to Other Projects	Involves More than One Partner	Optimizes Water Supply Reliability	Protects or Improves Water Quality	Manages Flood Risks	Optimizes Conjunctive Use of Surface and Groundwater Supplies	Directly Benefits Disadvantaged Communities	Maximize Stakeholder Involvement and Stewardship	Identified in Existing Plan
1. Optimize water supply reliability.	Provide reliable water supply for residential and commercial, agricultural community, or tourism needs.	X	X	X	O	O	X	X			O	O	X
	Manage groundwater levels to reduce overdraft, manage perched water, and minimize subsidence.	X	X		O	O	X	X		O	O	O	X
	Secure reliable imported water supply, including restoring/improving reliability of State Water Project supply and securing other imported water supplies.	X	X		O	O	X	X		O	O	O	X
	Maximize local supply opportunities, including water conservation, water recycling and source substitution, and capture and infiltration of runoff.	X	X	X	O	O	X	X	O		O	O	X



Goals	Objectives	DWR IRWM Principles					Priorities of the Coachella Valley						Feasibility
		Addresses Multiple IRWM Plan Objectives	Integrates Multiple Resource Management Strategies	Addresses a Statewide Priority[1]	Linked to Other Projects	Involves More than One Partner	Optimizes Water Supply Reliability	Protects or Improves Water Quality	Manages Flood Risks	Optimizes Conjunctive Use of Surface and Groundwater Supplies	Directly Benefits Disadvantaged Communities	Maximize Stakeholder Involvement and Stewardship	Identified in Existing Plan
2. Protect water quality.	Protect groundwater quality and improve, where feasible.	X	X	X	O	O	X	X		O	O	O	X
	Preserve and improve surface water quality by maintaining integrity of agricultural drainage systems, protecting the quality of natural runoff used for potable supply, and reducing pollution in stormwater runoff.	X	X	X	O	O	X	X		O	O	O	X
3. Provide stewardship of our water-related natural resources.	Preserve water-related local environment and restore, where feasible.	X	X	X	O	O		O			O	O	X
	Manage flood risks, including current acute needs and needs for future development.	X	X	X	O	O	X	X	X		X	O	X
4. Coordinate and integrate water resource management.	Optimize conjunctive use of available water resources.	X	X		O	O	X	O		X	O	O	X
	Maximize stakeholder involvement and stewardship in water resource management.	X			X	X	X	X	O	O	X	X	X



Goals	Objectives	DWR IRWM Principles					Priorities of the Coachella Valley						Feasibility
		Addresses Multiple IRWM Plan Objectives	Integrates Multiple Resource Management Strategies	Addresses a Statewide Priority[1]	Linked to Other Projects	Involves More than One Partner	Optimizes Water Supply Reliability	Protects or Improves Water Quality	Manages Flood Risks	Optimizes Conjunctive Use of Surface and Groundwater Supplies	Directly Benefits Disadvantaged Communities	Maximize Stakeholder Involvement and Stewardship	Identified in Existing Plan
5. Ensure cultural and social sustainability of water in the Coachella Valley.	Address water-related needs of local Native American culture.	X	X	X	O	O	X	X			O	X	X
	Address water and sanitation needs of disadvantaged communities.	X	X	X	O	O	X	X			X	X	X
	Maintain affordability of water.	X			O	O	X	O		O	O	O	X
	Relative Ranking/Importance to Achieving IRWM Goals and Objectives	A	A	B	C	C	B	B	B	B	B	B	A

X = directly related; O = indirectly related

Proposed initial weighting: A = 25% (addresses 7+objectives), B=12.5% (achieves 2-6 objectives), C=6.25% (achieves <2 objectives directly).

1. Statewide Priorities are:
   - Drought preparedness
   - Use and reuse water more efficiently
   - Climate change response actions
   - Expand environmental stewardship
   - Practice integrated flood management
   - Protect surface water and groundwater quality
   - Improve tribal water and natural resources Ensure equitable distribution of benefits



Table 9-2: Project Scoring Guide

Component	Criterion	Scoring Procedure[1]	Points Assigned	Weighting	Sub-total
1. Principles of IRWM Planning	A. Addresses Multiple IRWM Plan Objectives	Score based on # of objectives addressed	4+ objectives = 20 pts 3 objectives = 15 pts 2 objectives = 10 pts 1 objective = 5 pts	11%	70
	B. Integrates Multiple Resource Management Strategies	Score based on # of strategies employed	8+ strategies = 20 pts 6-7 strategies = 15 pts 4-5 strategies = 10 pts 2-3 strategies = 5 pts	11%	
	C. Addresses a Statewide Priority	Score is based on Yes/No response	Yes = 10 pts No = 0 pts	6%	
	D. Linked to Other Projects	Score is based on Yes/No response	Yes = 10 pts No = 0 pts	6%	
	E. Involves More than One Partner	Score is based on Yes/No response	Yes = 10 pts No = 0 pts	6%	
2. Priorities of the Coachella Valley	A. Optimizes Water Supply Reliability	Score is based on Yes/No response	Yes = 20 pts No = 0 pts	9%	120
	B. Protects or Improves Water Quality	Score is based on Yes/No response	Yes = 20 pts No = 0 pts	9%	
	C. Manages Flood Risks	Score is based on Yes/No response	Yes = 20 pts No = 0 pts	9%	
	D. Optimizes Conjunctive Use of Surface and Groundwater Supplies	Score is based on Yes/No response	Yes = 20 pts No = 0 pts	9%	
	E. Directly Benefits Disadvantaged Communities	Score is based on Yes/No response	Yes = 20 pts No = 0 pts	9%	
	F. Maximizes stakeholder involvement and stewardship in water resource management*	Score is based on Yes/No response	Yes = 20 pts No = 0 pts	9%	
3. Project Feasibility	A. Identified in Existing Plan	Score is based on Yes/No response	Yes = 10 pts No = 0 pts	6%	10
				Total	**200**

1. New prioritization criterion based on input received by stakeholders on Objective J (refer to *Chapter 6 Objectives* for more information)

9.2.3 IRWM Project Selection Factors

The following subsections outline the project selection factors identified by DWR and used by the CVRWMG in the project selection process. Refer to *Chapter 8 Resource Management Strategies, Section 8.5 Adapting Resource Management Strategies to Climate Change* for more information regarding climate change adaptation and mitigation. To receive full credit for meeting a selection criterion, projects must be consistent with the description or requirements of each criterion as provided in the appropriate chapter of this IRWM/SWR Plan or relevant source document (e.g., statewide priorities as described in DWR documentation). Partial credit may be awarded to projects that partially meet a criterion or indirectly contribute to criteria.

Contribution to IRWM/SWR Plan Objectives

As described above, one of the primary scoring criteria used for the project review process is to degree to which a project contributes to the regional objectives. The various projects submitted for this IRWM/SWR Plan and associated funding applications are scored (Criterion 1A and 2A-E) based on how well each project contributes to the objectives, up to a maximum of 200 points. The established IRWM/SWR Plan Objectives are listed below:

A. Provide reliable water supply for residential and commercial, agricultural community, and tourism needs.
B. Manage groundwater levels to reduce overdraft, manage perched water, and minimize subsidence.
C. Secure reliable imported water supply, including restoring/improving reliability of State Water Project supply and securing other imported water supplies.
D. Maximize local supply opportunities, including water conservation, water recycling and source substitution, and capture and infiltration of runoff.
E. Protect groundwater quality and improve, where feasible.
F. Preserve and improve surface water quality by maintaining integrity of agricultural drainage systems, protecting the quality of natural runoff used for potable supply, and reducing pollution in stormwater runoff.
G. Preserve water-related local environment and restore, where feasible.
H. Manage flood risks, including current acute needs and needs for future development.
I. Optimize conjunctive use of available water resources.
J. Maximize stakeholder involvement and stewardship in water resource management.
K. Address water-related needs of local Native American culture.
L. Address water and sanitation needs of disadvantaged communities, including those in remote areas.
M. Maintain affordability of water.

The IRWM/SWR Plan also provides measurable targets for each IRWM/SWR Plan objective. These measurable targets provide a way to assess each submitted project's contribution to the regional goals and objectives established by the Coachella Valley's stakeholders. Each project's contribution to the IRWM/SWR Plan objectives will be measured and monitored during project implementation. The CVRWMG coordinates with project proponents on an ongoing basis to evaluate the status of each IRWM project. The CVRWMG provides general updates to stakeholders on each of the grant rounds and when

projects are anticipated to be complete. Once projects are complete, project sponsors are invited to present the results of the completed project at the Planning Partners meetings.

Relationship to RMS

The implementation by stakeholders of projects included in **Appendix VI-H** incorporate a wide range of resource management strategies (RMS) to achieve the Region's goals and objectives (see *Chapter 8 Resource Management Strategies* for a detailed discussion). Each RMS identified in the *California Water Plan Update 2009*, as well as others identified by Region stakeholders, can contribute to the IRWM/SWR Plan goals and objectives.

Table 8-2 (in *Chapter 8 Resource Management Strategies*) presents Coachella Valley's regional objectives and their correlation to the RMS. Project submittals are required to identify both the regional goals and objectives and the specific RMS employed by each implementation project. The diversification of management strategies across the Region's implementation projects will ensure that all critical water management needs are addressed without fail.

Potential changes the Region may face because of climate change include increased droughts in increased variability in rainfall. *Chapter 8 Resource Management Strategies, Section 8.5 Adapting Resource Management Strategies to Climate Change* describes the potential impacts of climate change, and presents how the RMS included in the 2018 IRWM/SWR Plan contribute to climate change mitigation and adaptation strategies.

Statewide Priorities

The Statewide Priorities identified by DWR in their IRWM Grant Program Guidelines (July 2016) include a broad range of project types that address current water management issues. These Statewide Priorities are presented in **Table 9-3**. The 2010 Statewide Priorities were considered during development of the Region's goals and objectives and the 2016 Statewide Priorities were considered during this 2018 IRWM/SWR Plan update. However, regional needs and issues were of primary importance.

Of the eight aforementioned priorities set forth by DWR, CVRWMG and the Planning Partners considered one priority, Climate Change Response Actions, separately from the other Statewide Priorities in the project review process. For specific information on how this priority was considered, please refer to the sections below.

Technical Feasibility

The CVRWMG and Planning Partners consider the technical feasibility of submitted projects during the review and prioritization process. Technical feasibility is related to the knowledge of the project location; knowledge of the water system at the project location; or the material, methods, or processes proposed to be employed in the project. Technical feasibility of each project submittal is assessed through the following fields in the online project database: list regulatory permits; list California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) documents; list feasibility study(s); and describe need for project.

A list of regulatory permits will demonstrate how the project has developed. Dates of permitting will show how long the project has been underway and give the CVRWMG an idea of how much funding is required in order to complete the project. Greater understanding of the project will be achievable if permitting documentation is accounted for in the project prioritization process.

Providing proof of CEQA and NEPA documents will identify a project's environmental circumstances which can help pinpoint a project's technical feasibility. According to Section 21001 of the CEQA Guidelines, the CEQA environmental review process in intended to:

- Develop, maintain and enhance a high-quality environment;
- Provide California's residents with clean air and water, and with historical, scenic, natural and pleasing visual amenities;
- Prevent the elimination of fish and wildlife species and communities for present and future generations;
- Provide long-term environmental protection plus a decent home and living environment to its citizens;
- Create and maintain harmony between people and nature so that short and long-term social and economic benefits can be gained;
- Develop standards and procedures designed to provide environmental protection;
- Consider short and long-term economic and technical costs and benefits when approving development proposals;
- Foster intergovernmental coordination and cooperation; and
- Enhance public participation in government planning and decision making.

CEQA/NEPA documentation will include project background, methods, goals, data, environmental risks, and other components that will help project proponents gauge the technical feasibility of their projects. Per Section 15262 of the CEQA Guidelines, this IRWM/SWR Plan qualifies as a planning study and does not have a legally binding effect of the participating agencies. As such, programmatic environmental analysis under CEQA is not required.

The existence of a technical feasibility study will provide greater efficiency in project selection. The feasibility study will provide CVRWMG with an evaluation of the potential impacts of the proposed project, including potential impacts specific to DACs. The analysis will help CVRWMG determine how likely the project will achieve regional and statewide goals and objectives and how well the project will score within DWR's established grant scoring process (refer to *Section 9.2.2 IRWM Project Review and Prioritization Process* above for more information). As explained within *Chapter 4 Disadvantaged Communities*, technical feasibility requirements may disproportionately impact DACs, which may not have the technical resources available to complete technical feasibility documents prior to and without IRWM grant funding.

A list of projects' needs can provide significant guidance for project selections. As described later in the chapter, if project needs touch upon critical issues of the Region (i.e. DAC/tribal lands water quality, environmental justice) then, greater consideration will be taken. This information was considered both during project review and scoring, as well as during consideration of projects for specific funding applications.

Projects submitted as part of this IRWM/SWR Plan are expected to be in varying stages of implementation, including planning, feasibility study, design and engineering, restoration, and construction. Several implementation projects may be considered "technical feasibility studies" to prepare for future construction projects that meet the Coachella Valley's water management needs. Additionally, several projects may be land acquisition projects that would not require a demonstration of technical feasibility.



For those projects that would require demonstration of technical feasibility, and are not technical feasibility studies themselves, technical feasibility is be demonstrated in either the form of 1) published feasibility studies, master plans, pre-design studies and/or 2) by successful implementation and operation of other similar projects.

Table 9-3: Statewide Priorities

Statewide Priority	Description
Make Conservation a Way of Life	Proposals that contain projects that implement or expand water conservation efforts by contributing to sustainable water supply and reliability. Desirable proposals will do one or more of the following: • Building on current water conservation efforts and promoting the innovation of new systems for increased water conservation. • Expand agricultural and urban water conservation and efficiency to exceed SB-X7-7 targets • Provide funding for conservation and efficiency • Increase water sector energy efficiency and greenhouse gas (GHG) reduction capacity • Promote local urban conservation ordinances and programs
Increase Self-Reliance and Integrated Water Management Across All Levels of Government	Proposals that include projects that increase local supply reliability through integrated water management efforts. Desirable proposals include those with projects that: • Ensure water security at the local level, where individual government efforts integrate into one combined regional commitment where the sum becomes greater than any single piece • Support and expand funding for Integrated Water Management planning and projects • Improve land use and water alignment • Provide assistance to disadvantaged communities • Encourage State focus on projects with multiple benefits • Increase the use of recycled water
Achieve the Co-Equal Goals for the Delta	This action is directed towards State and federal agencies; however, consideration will be afforded to eligible local or regional projects that also support achieving the co-equal goals providing a more reliable water supply for California and to protect, restore, and enhance the Delta ecosystem.
Protect and Restore Important Ecosystems	Proposals that: • Continue protecting and restoring the resiliency of our ecosystems to support fish and wildlife populations, improve water quality, and restore natural system functions • Restore key mountain meadow habitat • Manage headwaters for multiple benefits • Protect key habitat of the Salton Sea through local partnership • Restore coastal watersheds • Continue restoration efforts in the Lake Tahoe Basin • Continue restoration efforts in the Klamath Basin • Water for wetlands and waterfowl • Eliminate barriers to fish migration • Assess fish passage at large dams • Enhance water flows in stream systems statewide

Statewide Priority	Description
Manage and Prepare for Dry Periods	Proposals that contain projects that effectively manage and prepare for dry periods by contributing to sustainable water supply and reliability during water shortages. Desirable proposals will achieve one or more of the following: • Effectively manage water resources through all hydrologic conditions to reduce impacts of shortages and lessen costs of state response actions. Secure more reliable water supplies and consequently improve drought preparedness and make California's water system more resilient • Revise operations to respond to extreme conditions • Encourage healthy soils
Expand Water Storage Capacity and Improve Groundwater Management	Proposals that: • Increase water storage for widespread public and environmental benefits, especially in increasingly dry years and better manage our groundwater to reduce overdraft • Provide essential data to enable Sustainable Groundwater Management • Support funding partnerships for storage projects • Improve Sustainable Groundwater Management • Support distributed groundwater storage • Increase statewide groundwater recharge • Accelerate clean-up of contaminated groundwater and prevent future contamination
Provide Safe Water for All Communities	Proposals that: • Provide all Californians the right to safe, clean, affordable and accessible water adequate for human consumption, cooking, and sanitary purposes • Consolidate water quality programs • Provide funding assistance for vulnerable communities • Manage the supply status of community water systems • Additionally, as required by Water Code §10545, in areas that have nitrate, arsenic, perchlorate, or hexavalent chromium contamination, consideration will be given to grant proposals that included projects that help address the impacts caused by nitrate, arsenic, perchlorate, or hexavalent chromium contamination, including projects that provide safe drinking water to small disadvantaged communities
Increase Flood Protection	Proposals that: • Collaboratively plan for integrated flood and water management systems, and implement flood projects that protect public safety, increase water supply reliability, conserve farmlands, and restore ecosystems • Improve access to emergency funds • Better coordinate flood response operations • Prioritize funding to reduce flood risk and improve flood response • Encourage flood projects that plan for climate change and achieve multiple benefits
Increase Operational and Regulatory Efficiency	This action is directed towards State and federal agencies; however, consideration will be afforded to eligible local or regional projects that also support increased operational of the State Water Project or Central Valley Project.
Identify Sustainable and Integrated	This action is directed towards State agencies and the legislature.

Statewide Priority	Description
Financing Opportunities	

Source: Proposition 1 IRWM Grant Program Guidelines (DWR 2016)

Critical Issues in DACs

As described above, the project selection process considered if a project helps to address critical water supply and water quality needs of DACs within the Region. The various projects submitted for this IRWM/SWR Plan were scored (Criterion 1A and 2E) based on how well each project contributes to addressing DAC needs, up to a maximum of 40 points. The "Call for Projects" was opened for any public agency or non-profit organization, including DACs, who wanted to submit water projects within the Region. *Chapter 4 Disadvantaged Communities* provides an overview of DAC geography and demographics. *Chapter 3 Issues and Needs, Section 3.1.8 Disadvantaged Communities* includes an explanation of important water and wastewater issues pertinent to Coachella Valley DACs.

The affordability of water, improvement of water quality, and lack of water and wastewater infrastructure are among the main concerns in DACs. All implementation projects that address these concerns were given allocated points in the scoring process.

During Proposition 84-Rounds 1, 2, 3, and 4, a total of 54 submitted projects addressed critical DAC issues. The CVRWMG provided local representatives from DAC organizations – primarily the eastern Coachella Valley collaborative between Pueblo Unido CDC, Poder Popular, and CRLA – with technical support in developing project information for submittal to the IRWM/SWR Plan. The forthcoming CRFA DAC Needs Assessment, anticipated to be complete in December 2020, will further define DAC needs and priority projects to address those needs.

Chapter 11 Framework for Implementation provides an overview of benefits expected from each type of project and project component (**Table 11-1**). Projects implemented in DACs are expected to provide these benefits to DACs. *Chapter 11 Framework for Implementation* also highlights which benefits are likely to provide a greater benefit to DACs compared to other communities in the Region.

Critical Issues on Tribal Lands

There are seven Native American tribes located in or near the Region, as shown in **Figure 2-15** (see *Chapter 2 Region Description*). Tribes were included and participated in the "Call for Projects" during development of this IRWM/SWR Plan. As explained in *Chapter 3 Issues and Needs* Coachella Valley tribal lands suffer from a lack of adequate water and wastewater infrastructure and high costs associated with improving it. There is a lack of basic water and wastewater infrastructure on some tribal lands in the eastern Coachella Valley. For instance, private sewer facilities are undersized or inadequate in low percolation areas.

Of the 68 submitted projects in Round 1, one was submitted by a tribal government; this project promotes wetland expansion in Desert Cahuilla located on the northwest shore of the Salton Sea. Further, several additional IRWM projects – specifically those improving local groundwater conditions – provide benefits to tribal governments. The Region's *Proposition 84-Round 2 Implementation Grant Proposal* includes planning and design support for extension of municipal water supplies to an economically disadvantaged tribal community in the eastern Coachella Valley.

As described above, *Chapter 11 Framework for Implementation* provides an overview of benefits expected from each type of project and project component (**Table 11-1**). Projects implemented by Tribal Nations, on tribal land, or directly related to tribes in other ways (such as constructing a connection between tribal land and existing service areas, even if connection is not on tribal land) are expected to provide these benefits to tribes. *Chapter 11 Framework for Implementation* also highlights which benefits are likely to provide greater benefits to tribes.

Environmental Justice Considerations

Environmental justice is defined in California law (Government Code section 65040.12) as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws and policies." Environmental justice in water management includes:

- Supporting community health, as well as a clean and safe environment,
- Diversifying the decision-making process by calling for involvement of all people and communities,
- Encouraging a more equitable distribution of economic benefits,
- Empowering communities themselves to take action towards improving their environment,
- Increasing awareness, understanding and effective cooperation within and among communities, and,
- Ensuring the right of all people to equal and fair treatment under the laws and regulations of the United States.

IRWM/SWR Plan projects that support water supply diversity and water quality improvement ensure equitable water supply reliability, quality, safety, and economic benefits for all water users within the Coachella Valley, regardless of ethnicity or economics. For example, DACs (along with the Region's population as a whole) will benefit from floodplain management projects that address current flooding issues.

Stakeholder outreach programs (see *Chapter 7 Stakeholder Involvement*) used to develop this IRWM/SWR Plan support the inclusion of DACs located within the Region's municipalities and unincorporated areas. The CVRWMG has historically held Planning Partners meetings in which all DACs were invited. Moving forward, the CVRWMG will strive to conduct future Planning Partners meetings on a quarterly basis and is committed to holding Planning Partners meetings semi-annually; however, these meetings may be held more or less frequently depending upon the status of the IRWM Program and SWGP. The priority of future Planning Partners meetings will be to keep Planning Partners informed about important milestones and provide a venue for the CVRWMG to vet major decisions and discuss time-sensitive issues with the Planning Partners. Planning Partners include the County of Riverside, Coachella Valley area cities, DAC representatives, tribal staff, and other invited water-related organizations.

As described above, many of the submitted IRWM/SWR Plan projects address environmental justice by (1) creating safe and reliable water supply for DACs, (2) improving water quality within DACs, and/or (3) reducing flood risks within DACs.

Project Costs and Financing

Estimated costs and project implementation information presented within this IRWM/SWR Plan (see *Chapter 11 Framework for Implementation, Section 11.5 Finance*) were derived from project proponents, so costs for all projects presented herein should be considered preliminary planning estimates. Project costs will be subject to refinement and adjustment in future plan updates and in future grant funding applications.

Project information on benefits, impacts, technical feasibility, and schedules were also provided by project proponents. Additional analysis of submitted project information will be required as part of future funding prioritization efforts to (1) confirm the submitted project information, and (2) to ensure consistency in the methods used to develop the project information.

Economic Feasibility

As part of the project selection process, the economic feasibility of each project was considered. Project proponents were asked to submit information about minimum and maximum project costs, grant funds requested, estimated local match amount, match type, and annual operations and maintenance costs. Completing this information indicates that the project proponents has developed a complete scope and budget necessary for project implementation. Further, additional information on cost effectiveness and certainty of local cost share was requested from project sponsors during deliberation of the funding application package.

A full economic-benefits analysis will be developed as part of the IRWM implementation grant application process. According to DWR's Economic Analysis Guidebook, the objective of economic analysis is to determine if a project represents the best use of resources over the analysis period (that is, the project is economically justified). The test of economic feasibility is passed if the total benefits that result from the project exceed those which would accrue without the project by an amount in excess of the project costs, according to the guidebook. For more information regarding the economic feasibility, please refer to *Chapter 11 Framework for Implementation, Section 11.5.1 Sources and Certainty of Funding.*

Project Status

Project status, also known as "readiness to proceed," is completed in the project database by the project proponents. This field is considered during project prioritization; however, readiness to proceed is not necessarily a reason for project exclusion from an IRWM/SWR Plan. As the planning horizon for an IRWM/SWR Plan is 20 years, even a conceptual project should be considered as it may be projected to have benefits that would be worth realizing by implementing the project or by developing an alternate, integrated, or modified project.

Project status may have to be reconsidered as implementation projects are matched with sources of grant funding. Funding sources may want projects completed within certain time limits. However, it is also true that some funding sources may cover planning or developmental phases of a project. The CVRWMG will keep in mind conditions of the specific funding opportunities and will communicate this information to all project proponents during the "Call for Projects" and subsequent project selection processes.

Strategic Considerations

Integrating similar projects – based on geographic or RMS similarities – have and will be considered by the CVRWMG, Planning Partners, and other stakeholders before proceeding with project selection. The

CVRWMG has taken full advantage of the principals of IRWM planning by combining or modifying local projects into regional projects or 'packages.'

At the CVRWMG Integration Workshop held on August 11, 2010 and a Planning Partners meeting on September 28, 2010, brainstorming sessions occurred and the resulting suggestions for integration were communicated to project proponents. For example, project proponents have collaborated to integrate multiple septic conversion projects, water quality related projects, and/or water recycling projects. Recommendations that projects within geographic proximity be combined were also communicated and implemented. The CVRWMG held a similar brainstorming session at the October 2018 Planning Partners meeting in preparation for the Proposition 1-Round 1 IRWM Implementation Grant.

The online project database requests information from project sponsors on identifying linkages with other projects. Other strategic considerations include the project being identified in existing planning documents, and consideration of project sponsors.

Climate Change Adaptation

For additional detail on climate change considerations, please refer to *Chapter 2 Region Description, Section 2.8 Climate Change* and/or *Chapter 8 Resource Management Strategies, Section 8.5 Adapting Resource Management Strategies to Climate Change.* Climate change concerns are acknowledged and incorporated into long-term planning related to water supply, water quality, and flood management in the Coachella Valley. The CVRWMG recognizes that climate change could affect future water supply availability and reliability. Therefore, the CVRWMG will consider projects that aim to conserve and manage future sustainability of the Region's water supply. As described in *Chapter 8 Resource Management Strategies*, the RMS included in this IRWM/SWR Plan help to address climate change, so consideration of RMS inherently includes how a project contributes to climate change adaptation. Specifically, **Table 8-3** in *Chapter 8 Resource Management Strategies* demonstrates which RMS would help the Region to adapt to climate change vulnerabilities and which would help to mitigate GHG emissions.

Climate Change Mitigation

The CVRWMG recognizes the relationship between energy consumption, GHG emissions, and water resources management. Consideration is given in the project selection process to projects that incorporate GHG emission reduction strategies. GHG reduction methods such as California Air Resources Board (CARB) strategies (see *Chapter 2 Region Description, Section 2.8.1 Legislative and Policy Context)*, participation in the California Climate Action Registry, and carbon sequestration (where practical) are recommended to agencies and organizations participating in IRWM planning. Additionally, *Chapter 8 Resource Management Strategies, Section 8.5 Adapting Resource Management Strategies to Climate Change*, describes how the RMS selected for inclusion in the IRWM/SWR Plan help to address climate change.

9.3 List of Selected IRWM Projects

This section describes how the submitted IRWM project list(s) will be stored, maintained, and shared.

Periodic updates of the Coachella Valley IRWM project list must be made to ensure current projects are considered for each new funding opportunity. Updating the project list will allow new projects to be added,

as regional conditions or the State's regulatory setting changes. This will also allow project proponents to update and revise their project submittals as necessary. The online project database developed for this IRWM Plan will remain open and available to project proponents for updates, additions, and revisions over time. As new funding opportunities arise, the CVRWMG will communicate new project submittal deadlines and other relevant information.

The Coachella Valley IRWM project list is accessible through the online project database (http://www.cvrwmg.org/projects.php). The online project database allows project proponents to update project information, review other projects and identify integration opportunities, and add additional features so the projects provide multiple benefits. This online project database allows the project list to remain "live", always available for review and update. The Coachella Valley IRWM/SWR Plan does not require re-adoption following changes to this project list. While the online project database contains the official Coachella Valley IRWM project list, **Appendix VI-H** provides a list of IRWM projects included in the database as of February 26, 2018 as an example of projects that have been submitted in the past. **Appendix VI-H** is not to be considered an exhaustive list of projects, nor does it limit the projects or types of projects that can be submitted to the database.

When the CVRWMG identifies each new funding opportunity, it will work with the Planning Partners to review, score and rank, and select projects for the funding application. A list of projects selected for inclusion in grant applications will be provided to stakeholders via the stakeholder email list and at a Planning Partners meeting. All grant applications will be submitted to the Planning Partners for review and approval prior to submission to the CVRWMG governing bodies and grant agency.

Modification Process

Chapter 7 Stakeholder Involvement presents an overview of the CVRWMG's governance structure overseeing Plan implementation. The CVRWMG will similarly be responsible for conducting periodic IRWM/SWR Plan reviews and updates. The list of projects to be considered for implementation identified in this section will be subject to review and revision as part of the periodic IRWM/SWR Plan updates. Over time, it is expected that some projects included in this IRWM/SWR Plan will be implemented, and other projects not currently included in this IRWM/SWR Plan will be added to the project database for implementation (see *Chapter 7 Stakeholder Involvement, Section 7.8.1 Updating or Amending the IRWM/SWR Plan* for more information).

9.4 IRWM Grant Funding Proposal Prioritization

This section describes how the submitted IRWM project list(s) will be prioritized for future grant funding proposals.

Projects selected for grant funding packages will be selected using a funding proposal prioritization process that goes beyond the IRWM prioritization process presented above. The prioritization process presented above described the prioritization process used to identify top implementation projects. While this process ranked projects based on ability to address regional objectives and other criteria, the process does not identify specific groups of projects for which funding should be sought. The reason for this is twofold:

1. Prioritizing projects for a specific funding proposal in the IRWM/SWR Plan would limit the versatility of the prioritization process for use in identifying projects for future funding opportunities; and

2. As this IRWM/SWR Plan is intended to be a living document, the prioritization process presented in this IRWM/SWR Plan should remain flexible, such that it may be adapted to changing regional needs.

A supplemental prioritization process must be implemented to identify appropriate projects from the implementation project list to be included in future funding proposals as they arise. The details of this process are fluid and should reflect the specific needs and requirements of the given funding opportunity.

As each new funding opportunity arises, the CVRWMG shall convene a Workgroup made up of CVRWMG members, Planning Partners, and/or other appropriate stakeholders to review and evaluate the IRWM/SWR Plan project list against the funding solicitation. During this evaluation process, the following criteria will likely be used identifying high priority projects:

- **Grant Program Preferences:** Funding programs frequently outline specific goals and objectives. Projects selected for inclusion in a funding proposal should conform to the details of the specific funding program.
- **Regionalism**: Some projects may have only local beneficiaries, while other projects may benefit stakeholders throughout the entire Region. Projects with Region-wide benefits may be preferable to those with only local beneficiaries when applying for funding as a Region.
- **Cost-Effectiveness:** As the cost of doing business continues to increase, agencies are challenged to identify cost-effective solutions. Both short- and long-term cost-effectiveness, as well as potential externalized costs to the public, may be a factor for consideration in funding proposal prioritization.
- **Readiness to Proceed**: Some funding opportunities require projects to be at a specific point in development, such as design or construction, while other opportunities may be targeted toward planning-level projects.

As appropriate, the CVRWMG will incorporate these and other prioritization criteria to narrow the pool of high priority projects from the IRWM/SWR Plan-level prioritization to develop funding proposals. These criteria may be applied in multiple ways. Some prioritization criteria are essential to a project's success in achieving the Region's objectives and/or being eligible for funding. The specific criteria used, and precise method for applying the criteria, will be determined on a case-by-case (i.e., funding opportunity by funding opportunity) basis using a consensus-based approach among the Workgroup.

9.5 Stormwater Project Evaluation and Prioritization



This section describes how submitted projects satisfy SWRP benefit categories using an integrated metrics-based analysis. In addition, this section also outlines how stormwater projects will be identified and prioritized based on provided benefits to the Planning Area.

Stormwater resource management is an integral part of many of the Coachella Valley IRWM regional objectives. Development and implementation of SWRP projects can help the Region meet its IRWM planning targets and ultimately address the regional goals and objectives. The following sections summarize the stormwater resource priorities in the IRWM/SWR planning area, the stormwater benefits metrics used to measure progress toward meeting stormwater objectives, the SWRP project prioritization process, and the integrated project analysis of how the SWRP projects will collectively address the identified water management objectives for the IRWM/SWR planning area using the defined benefit metrics.

9.5.1 Stormwater Priorities

The Coachella Valley has unique stormwater-related issues and priorities. Due to the surrounding mountainous topography and underlying valley floor geology, flooding is a prominent issue in the Coachella Valley. Stormwater management facilities are lacking in many areas of the SWR planning area resulting in high flood risk for many communities, particularly DACs, as described in *Chapter 2 Region Description, Section 2.2.7 Stormwater and Flood Management*. Since groundwater is a primary local water source for the majority of the population in the Region, the promotion of stormwater infiltration to the groundwater basin to increase local supply is a key water resource management objective. Because of these conditions, flood management and stormwater recharge are the primary stormwater priorities in the IRWM/SWR planning area. Stakeholders identified these priorities during the September 28, 2017 Planning Partners meeting described in *Chapter 6 Objectives, Section 6.3 Stormwater Resource Plan Benefits Prioritization*. Stakeholders prioritized stormwater benefits that provided flood management and recharge to the groundwater basin.

In addition to flood management and stormwater recharge priorities, water quality issues in the Coachella Valley Stormwater Channel (CVSC) are also a concern. As described in *Section Chapter 2 Region Objectives, 2.5.3 Surface Water Quality* and *Section 2.5.5 Stormwater Quality and Water Quality Compliance*, the CVSC is listed as impaired on the State's 303(d) list for Pathogens, dichloro-diphenyl-trichloroethane (DDT), Dieldrin, Polychlorinated biphenyl (PCBs), Toxaphene, and ammonia. A bacterial indictor TMDL was adopted by the Regional Board in 2007, with the revision adopted in 2010. TMDLs for the remaining impairments are scheduled to be developed over the next several years, with the most recently listed impairment having a TMDL deadline of 2025. In order to improve water quality conditions in the CVSC and meet environmental surface water quality compliance requirements, the primary water quality priority for the IRWM/SWR planning area is to address the existing bacterial indicator TMDL with a secondary water quality priority to address the other 303(d) listed water quality impairments that have not yet had TMDLs developed.

The IRWM/SWR planning area stormwater priorities align with the regional IRWM priorities and objectives as shown in **Table 9-4**.

Table 9-4: SWR Priorities and Related Regional IRWM Priorities and Objectives

SWR Priority Ranking	SWR Priority	Related Regional IRWM Priority	Related IRWM Objectives
1	**Flood Management:** Decreased Flood Risk	Manage Flood Risks	• **Objective H:** Manage flood risks, including current acute needs and needs for future development.
2	**Water Supply:** Stormwater Capture and Recharge into Groundwater Basin	• Optimize Water Supply Reliability • Optimize Conjunctive Use of Surface and Groundwater Supplies	• **Objective A:** Provide reliable water supply for residential and commercial, agricultural community, and tourism needs. • **Objective B:** Manage groundwater levels to reduce overdraft, manage perched water, and minimize subsidence. • **Objective D:** Maximize local supply opportunities, including water conservation, water recycling and source



SWR Priority Ranking	SWR Priority	Related Regional IRWM Priority	Related IRWM Objectives
			substitution, and capture and infiltration of runoff. • **Objective I:** Optimize conjunctive use of available water resources.
3	**Water Quality:** • Improve Surface Water Quality to Address Bacterial Indicator TMDL • Improve Surface Water Quality to address other 303(d) Listed Constituents	Protect or Improve Water Quality	• **Objective F:** Preserve and improve surface water quality by maintaining integrity of agricultural drainage systems, protecting the quality of natural runoff used for potable supply, and reducing pollution in stormwater runoff.

9.5.2 Stormwater Multiple Benefits and Associated Metrics

SWRP projects can provide multiple benefits by addressing stormwater management using a watershed-based approach, ultimately helping the Region meet the IRWM/SWR regional objectives and stormwater priorities. Stormwater benefits can be evaluated within five different benefit categories: water quality, water supply, flood management, environmental, and community benefits. Within each of the benefit categories, specific main and additional benefits have been identified that are most relevant to the Region. These benefits align with those presented in the *2015 SWRP Guidelines* (SWRCB 2015).

As part of the SWRP project submittal process, project proponents are responsible for quantifying project benefits based on documented and justifiable methods. To guide this quantification process, metrics were developed for each stormwater benefit within the five benefit categories. These metrics provide stakeholders with guidance on how to measure project benefits and are used to assess the collective benefits of stormwater projects over the planning area. The SWRP main and additional benefits as well as the metrics used to quantify them, are summarized in **Table 9-5** and **Table 9-6**. Additional benefits and related metrics used to quantify them will be incorporated as periodic updates of the SWRP project list occur.



Table 9-5: Summary of SWRP Main Benefits and Metrics

Benefit Category	Benefit	Quantitative Metrics
Water Quality	Increased filtration and/or treatment of runoff	• Average annual pollutant load reduction (lbs/yr) • Volume of water treated (mgd) • Volume of runoff infiltrated (AFY)
Water Supply	Increased water supply reliability	• Increase in water supply through direct groundwater recharge (AFY) • Increase in water supply through direct use (AFY)
	Conjunctive use	• Increase in water supply through in lieu recharge/ conjunctive use (AFY)
Flood Management	Decreased flood risk by reducing runoff rate and/or volume	• Reduction in peak flow discharge (cfs) • Reduction in volume of potential flood water (AFY)
Environmental	Environmental habitat protection and improvement	• Size of habitat protected or improved (acres) • Amount of instream flow rate improvement (cfs)
	Increased urban natural landscape and pervious surfaces	• Size of increase in urban natural landscape and pervious surfaces (acres)
Community	Employment opportunities provided	• Number of employment opportunities provided
	Public education	• Number of outreach materials provided, or events conducted

Table 9-6: Summary of SWRP Additional Benefits and Metrics

Benefit Category	Benefit	Quantitative Metrics
Water Quality	Nonpoint source pollution control	• Project Proponent Defined
	Reestablished natural water drainage and treatment	• Project Proponent Defined
	Treat more than one pollutant	• Number of pollutants treated
Water Supply	Water conservation	• Reduction in water use (AFY)
Flood Management	Reduced sanitary sewer overflows	• Reduction in sewer overflow volumes (AFY)
Environmental	Reduced energy use, GHG emissions, or provides a carbon sink	• Amount of energy consumption reduced (KWH/year) • Amount of GHG emissions reduced (tons/year)
	Reestablishment of natural hydrograph	• Project Proponent Defined
	Water temperature improvements	• Amount of temperature improvement (degrees F)
Community	Community involvement	• Number of participants per year
	Enhance and/or create recreational and public use areas	• Estimated visits per year

9.5.3 Stormwater Resource Plan Project Prioritization Process

Similar to the submittal process for IRWM projects, the submittal process for SWRP projects includes solicitation and prioritization. However, project selection does not occur as part of the submittal process as it does with IRWM projects due to the differences in funding programs. The CVRWMG engaged Coachella Valley stormwater stakeholders throughout the IRWM/SWR planning process to identify stormwater-related priorities for the Region. Planning Partners played an integral role by providing input to identify priority stormwater-related benefits through a benefits prioritization exercise as described in *Chapter 7 Stakeholder Involvement, Section 7.2.1 Group Membership and Participation* and submitting stormwater projects that best achieve the goals and objectives of the IRWM/SWR Plan. This section presents the process for prioritization and selection of stormwater projects, including:

- Procedures for submitting stormwater projects to the IRWM/SWR Plan, and
- Procedures for reviewing and prioritizing stormwater projects submitted to the IRWM/SWR Plan.

SWRP Project Submittal

Stormwater projects are submitted though the IRWM Opti database (further described in *Section 9.2.1 Project Submittal Process*) for inclusion in the SWRP. Although projects are submitted through the IRWM Opti database, the application and project selection process differ from the IRWM grant process. Project sponsors submitting stormwater projects for the SWGP submit individual applications to the State Water Resources Control Board (SWRCB). The CVRWMG and Planning Partners do not participate in the project selection process. Selection for funding is solely determined by the SWRCB.

The existing IRWM project database was modified to include a check box to identify SWRP projects and additional SWRP project-specific tabs. The SWRP Eligibility tab includes eligibility information to allow for an initial eligibility screening, which is described in Project Screening below and shown in **Figure 9-3**. The SWRP Benefits tab includes information on project benefits, quantification of benefits, how benefits will be achieved, and sources of quantification.

In January 2018, the CVRWMG released a "Call for Projects" to solicit SWRP projects for inclusion in the 2018 IRWM/SWR Plan Update. The CVRWMG will release an additional "Call for Projects" prior to SWGP funding round solicitations. The next SWGP funding solicitation (Round 2) is anticipated to open in early 2019.

Per the *2015 SWGP Guidelines*, stormwater projects must be included in a SWRP to be eligible for Proposition 1 funding. The project database constitutes a "living" project list and project sponsors can submit projects anytime for inclusion in the IRWM/SWR Plan. The SWRP project list is accessible through the online project database (http://www.cvrwmg.org/projects.php). While the online project database contains the official Coachella Valley SWRP project list, **Appendix VI-H** provides a list of SWRP projects included in the database as of February 26, 2018 as an example of projects that have been submitted in the past.

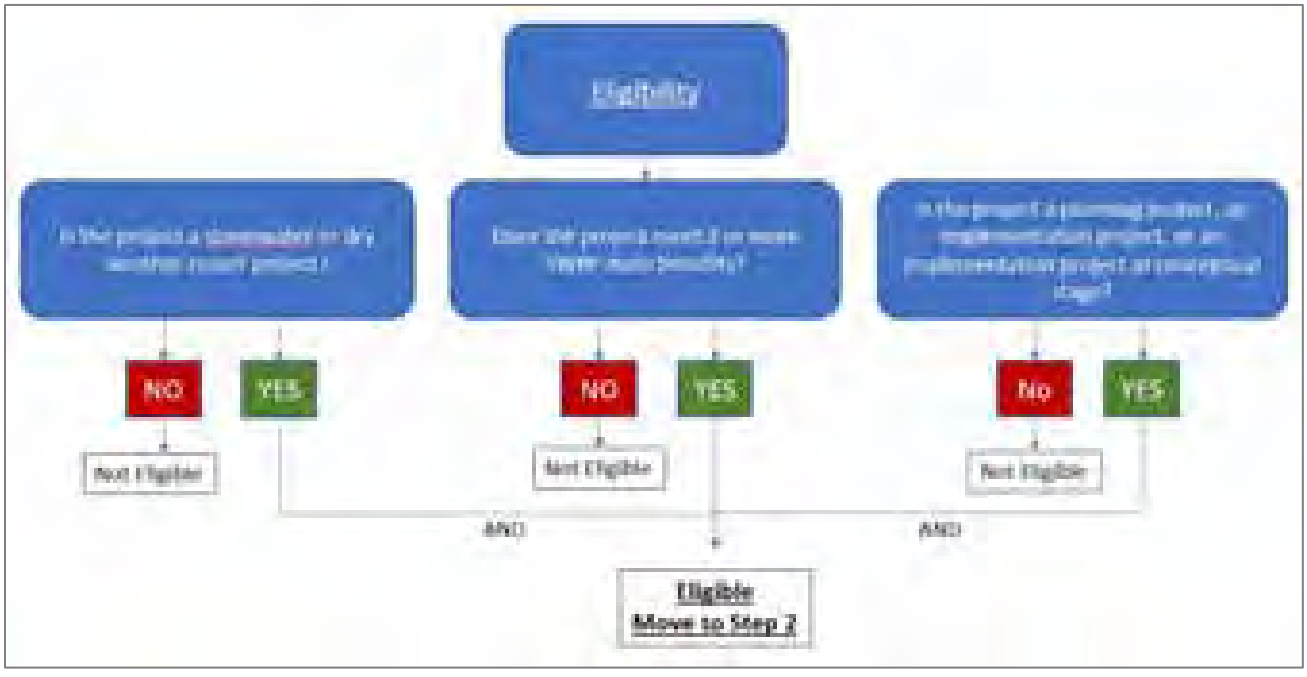
Project Screening

SWRP projects are scored and ranked in a two-step process. The first step in the SWRP project scoring and prioritization process is determining project eligibility. As discussed above, a SWRP Eligibility tab was added to the project database to allow project sponsors to determine project eligibility, which serves as an initial project screening process. Project eligibility is determined on a pass/fail basis and does not contribute

to scoring. The eligibility determination process is shown in **Figure 9-3**. Project eligibility requirements include:

- Must be an eligible applicant
  - Public agencies/entities
  - 501(c)(3) Nonprofit organizations
  - Federally recognized Indian Tribes
  - State Indian Tribes listed on the Native American Heritage Commission's Tribal Consultation List
  - Mutual water companies
- Project must be a stormwater or dry weather runoff project
- Project must contribute 2 or more Main Benefits and at least one additional benefit (see **Table 9-5**)
- Project must be a planning project or an implementation project (at planning or implementation stage)

Figure 9-3: SWR Project Eligibility Flow Chart



Project Prioritization

After eligibility is determined, SWRP projects submitted to the project database are scored and ranked (second step). **Table 9-7** below shows the project scoring methodology. Projects that result in multiple benefits score higher as additional benefits contributed by each project result in maximized water supply, water quality, flood management, environmental, and other community benefits within the Whitewater

River Watershed and IRWM/SWR planning area. Additional scoring criteria include secured capital and operation and maintenance (O&M) funding sources, project readiness, inclusion in an existing planning document, and addresses more than one pollutant. These scoring criteria are based off the SWRCB's *2015 SWRP Guidelines* and modified to accommodate regional priorities.

All stormwater projects must be ranked within a SWRP as an eligibility requirement to receive Proposition 1 funding. Scoring for Coachella Valley SWRP projects is automated in the project database and is presented in tiers. As shown in **Table 9-8**, a project that scores 12 points or more is a Tier 1 project, a project that scores 6 to 11 points is a Tier 2 project, and a project that scores 5 points or below is a Tier 3 project. It is important to note that project scoring and ranking does not hinder a project sponsor from applying for and potentially receiving SWGP grant funding. The SWRCB has stated that ranking will not be used to determine whether a project is funded. Project ranking is intended to be used as a tool by project sponsors to improve upon their projects, increase resulting benefits, and encourage collaboration between project sponsors. Unlike the IRWM project selection process, the CVRWMG has no authority to determine which SWRP projects are funded. It is recommended that project sponsors speak directly with a SWRCB representative to discuss specific projects and how SWGP applications will be processed and scored.

The SWRP projects submitted to the 2018 IRWM/SWR Plan during the January 2018 "Call for Projects" and each project's tiered ranking are shown in **Appendix VI-H**.

Table 9-7: Coachella Valley SWR Project Scoring Guide

Component	Criterion	Scoring Procedure	Points Assigned	Sub-Total
Eligibility	Is the project a stormwater or dry weather runoff project	Pass/Fail	-	-
	Does the project meet 2 or more SWRP main benefits	Pass/Fail	-	
	Is the project a planning project, an implementation project, or an implementation project at conceptual stage?	Pass/Fail	-	
Benefits and Quantification	Main Benefits	Score based on # of main benefits addressed (refer to *Section 9.5.2, Stormwater Multiple Benefits and Associated Metrics*)	5+ main benefits = 5 pts 4 main benefits = 4 pts 3 main benefits = 3 pts 2 main benefits = 2 pts	13

Component	Criterion	Scoring Procedure	Points Assigned	Sub-Total
	Additional Benefits	Score based on # of additional benefits addressed (refer to *Section 9.5.2, Stormwater Multiple Benefits and Associated Metrics*)	4+ additional benefits = 4 pts 3 additional benefits = 3 pts 2 additional benefits = 2 pts 1 additional benefit = 1 pt	
	Sources of Quantitative Benefits	Scored based on level of technical documentation that prepared for quantification	Design document = 4 pts Environmental Assessment = 3 pts Feasibility Study = 2 pts "Back of Envelope" = 1 pt	
Funding	Permanent Source of Funding for Capital Costs Secured	Score is based on Yes/No response	Yes = 1 pt No = 0 pts	2
	Permanent Source of Funding for O&M Costs Secured	Score is based on Yes/No response	Yes = 1 pt No = 0 pts	
Additional Scoring	Project located on Lands in Public Ownership	Score is based on Yes/No response	Yes = 1 pt No = 0 pts	8
	Project Readiness	Score is based on level of project readiness	Under Construction = 5 pts Design w/ Environmental = 5 pts Design w/o Environmental = 4 pts Feasibility study= 3 pts Master planning = 2 pts Conceptual planning = 1 pt	
	Project Identified in an Existing Study/Planning Document	Score is based on Yes/No response	Yes = 1 pt No = 0 pts	
	Project Addresses More than One Pollutant	Score is based on Yes/No response	Yes = 1 pt No = 0 pts	
Total				**23**

Table 9-8: Coachella Valley SWR Project Tiered Ranking

Score	Tier
12-23	Tier 1
6-11	Tier 2
0-5	Tier 3

9.5.4 Integrated Metrics-Based Analysis of Project Benefits

An integrated metrics-based benefit analysis was conducted using the stormwater projects submitted to the IRWM/SWR Plan to assess how the proposed stormwater and dry weather capture projects will address the IRWM/SWR Plan water management objectives and multiple benefits. The Coachella Valley SWRP project list is intended to be a living document. In practice, this means that projects will be added and updated beyond the initial creation of the IRWM/SWR Plan. Project solicitation periods would likely occur prior to funding solicitation periods or as needed. The project database will allow the project list and benefits quantifications to be continually updated by project proponents as projects are developed. The initial project information provided in the 2018 IRWM/SWR Plan Update reflects a set of stormwater projects submitted to the IRWM/SWR Plan and is intended to be refined as the projects move from conceptual to implementation stages. The subsections below describe the benefits analysis conducted using the information developed by the time of plan development.

An integrated analysis of stormwater and dry weather runoff project benefits was performed using the project submittal database according to the water quality, water supply, flood management, environmental, and community needs of the Region. As previously discussed, project proponents were responsible for quantifying project benefits using the benefit metrics provided. Benefits from all stormwater and dry weather runoff projects across the watershed were aggregated through the analysis to assess the aggregated planning area water quality, water supply, flood management, environmental, and community benefits.

The SWRP projects submitted to the project database and their associated benefit categories addressed by project implementation are listed in **Table 9-9**. Many of the SWRP project benefits were unable to be quantified at the time of the analyses. As projects evolve from a conceptual planning phase to a point where they are ready to proceed, it can be assumed that project proponents will be able to measure SWRP benefits with greater specificity and accuracy. The sections below describe the integrated benefit analysis according to the five SWRP benefit categories. Additional projects opportunities identified for the IRWM/SWR planning area, not covered by submitted projects are also discussed. Additional information related to SWRP project priority opportunities and project scoring is provided in Appendix VI-K.



Table 9-9: Stormwater Projects with Multiple Benefits

Project Name	Project Type	Water Quality Benefits	Water Supply Benefits	Flood Management Benefits	Environmental Benefits	Community Benefits
Thousand Palms Flood Control Project	Construction Project			X	X	
North Cathedral City Stormwater Master Plan	Construction Project			X	X	
East Side Dike Improvement Project - Phase I	Conceptual Design		X	X	X	
Trash Capture Systems	Other	X			O	
White Water Channel Extension to Connect with Current Salton Sea Water Level	Construction Project	O		O	X	O
St. Anthony Stormwater Capture Project	Construction Project	O		X	X	X
Coachella Monitoring Well Application and Project Study	Construction Project		O			X
Improvements for Existing Dry Well Located South of 52 Ave	Protection/ Restoration	O		O	O	X
Maxwell Installation	Construction Project	O	O	O		
Indio Stormwater Conveyance System 1	Construction Project	O	O	O		
Indio Stormwater Conveyance System 2	Construction Project	O	O	O		
Indio Stormwater Conveyance System 3	Construction Project	O	O	O		
Revitalize 20 Existing Dry Wells in Indio	Protection/ Restoration	O	O	O		
Jackson and Avenue 50 Retention Pond with Maxwell	Construction Project	O	O	O		
Avenue 48 Storm Drain in Indio	Construction Project	O	O	O		
Pierce Community Stormwater Project	Planning		O	O	O	O
Avenue 76 Community Stormwater Control Project	Planning		O	O	O	O
Stormwater Master Plan	Planning		O	O		

X = Claimed quantitative benefits; O = Claimed benefits, but no quantities.

Water Quality Projects Analysis

Potential water quality benefits provided by SWRP projects can include increased filtration and/or treatment of runoff, nonpoint source pollution control, and reestablished natural water drainage and treatment. Water quality improvements that reduce specific pollutants of concern in the Coachella Valley, such as pathogens, can support implementation of that bacterial indicator TMDL or reduction of other pollutants causing impairment of the CVSC. Projects with these benefits will help the Region address its related regional water quality objectives, including IRWM Objective F, further detailed in **Table 9-4** and *Chapter 6 Objectives, Section 6.3 Stormwater Resource Plan Benefits Prioritization*.

Project proponents may submit quantified water quality benefits into the project database, including pollutant load reduced (which varies by constituent), the volume of water treated, or the volume of water infiltrated (rather than discharging to the CVSC). Project proponents can specify pollutant load reduction for one or more of the following constituents: total suspended solids (TSS), total dissolved solids (TDS), Mercury, Diazinon, Chlorpyrifos, Selenium, Diuron, Fecal Coli/E. Coli Bacteria, Pyrethroids, Trash, Total Nitrogen, and any other specified pollutants. Individual project proponents may calculate these benefits using different tools or methodologies but would rely on the similar types of information. For example, in order to determine pollutant load reduction, project proponents would need to know information about stormwater quality, precipitation quantity, the volume of stormwater intercepted or treated by the project, and the amount of pollutant removal provided by the project.

At the time of the IRWM/SWR Plan development, 11 projects had noted water quality benefits as either main or additional benefits to their stormwater projects. These projects included 10 that will increase filtration or treatment of runoff and 10 that will reduce nonpoint source pollution, with some projects marking both as a benefit. The number of conceptual and ready to proceed projects that address these benefits is summarized in **Table 9-10**. The SWRP projects that will provide water quality benefits are identified in **Figure 9-4**.

Table 9-10: Water Quality Benefit Project Counts

Water Quality Benefits	Project Stage		Total
	Conceptual	Implementation	
Number of projects providing increased filtration and/or treatment of runoff	8	2	10
Number of projects providing nonpoint source pollution control	9	1	10
Total number of projects providing water quality benefits	**9**	**2**	**11**

Quantified water quality benefits from the projects submitted to the IRWM/SWR Plan were viewed collectively to estimate the watershed-wide pollutant load reductions. At the time of IRWM/SWR Plan development, only two projects had a quantified water quality benefits: the City of Indio's Trash Capture Systems project which is estimated to reduce the average annual trash loading from the Coachella Valley stormwater agencies by 50 pounds per year (lbs/yr) and the City of Coachella's Improvement of Existing Dry Well project is expected to remove 50% of TSS. Both the removal of trash and removal of TSS aid in reducing bacteria levels in runoff and will help address the SWRP water quality priority to meet bacterial indicator TMDL reductions. The bacteria reduction benefits will help the Region meet its IRWM Objective

F to preserve and improve surface water quality by reducing pollution in stormwater runoff in the Whitewater River Watershed.

While other projects highlighted pollutant removal as a project benefit, the loading reduction has not yet been quantified. These projects will reduce pollutant loading by retaining and infiltrating stormwater or reducing stormwater contact with dispersed pollutant sources. It is expected that additional measured water quality benefits will be quantified as more projects advance beyond conceptual design. The quantified water quality benefits over the watershed are summarized in **Table 9-11**.

Table 9-11: Water Quality Quantified Benefits

Water Quality Benefit	Total Quantified Benefit Over Watershed Area
Trash removed	50 lbs/yr
TSS removed	50% of existing TSS levels

Existing and Additional Project Opportunities

Source control and low impact development (LID) measures provide important opportunities for the Region to meet its stormwater water quality priorities and IRWM objectives. The discharge of potential pollutants in urban runoff is regulated under the Whitewater River Municipal Separate Storm Sewer Systems (MS4) permit. As part of permit compliance, Permittees are implementing measures to reduce stormwater pollutants using stormwater capture and onsite infiltration. For example, the City of Indio's Trash Capture Systems Project will install full capture trash devices in the storm drain inlets of the MS4 system. By preventing trash from entering the stormwater conveyance system, the project is also reducing the migration of other potential pollutants, such as bacteria, that could be transported with the trash. The City of Indio is also planning to implement several other projects that will reduce stormwater pollution by modifying conveyance structures, constructing retention facilities and providing infiltration features for groundwater recharge that will help reduce runoff volume in the watershed.

Riverside County Flood Control and Water Conservation District (RCFCWCD) has an ongoing, long-term project that was submitted to the IRWM/SWR Plan to assist the City of Coachella with the implementation of Best Management Practices (BMPs) to reduce and/or eliminate discharges of bacterial indicators from within the City of Coachella to the CVSC, which has been identified as impaired due to bacterial indicators. The City of Coachella has identified specific projects that can be implemented to achieve these goals. The projects include LID approaches to retrofitting urban areas, such as dry wells, infiltration swales and similar strategies. These LID retrofits provide opportunities to reestablish natural water drainage treatment and infiltration systems and other natural system functions that have been disrupted by development in the watershed. They can also provide source control of pollutants due to stormwater and dry weather runoff, onsite and local infiltration in urban areas, and use of storm water and dry weather runoff for vegetation.

Projects implementing stormwater BMPs to prevent stormwater and dry weather runoff pollution are provided by the RCFCWCD. Two handbooks accessible on the RCFCWCD's website outline the BMP and LID design criteria. The Riverside County Stormwater Quality Best Management Practices Design Handbook (2006) provides design procedures for structural BMPs for new development and redevelopment within Riverside County. Specific to the Whitewater River region, the Riverside County Whitewater River Region Stormwater Quality BMP Design Handbook for LID (2014) is another resource. The handbook provides selection and design guidance for stormwater BMPs for Priority Development Projects within the Whitewater River region of Riverside County while meeting the goals of LID, where feasible. IRWM/SWR Plan projects can utilize these resources to aid in BMP design.



Stormwater Projects in the Coachella Valley IRWM / SWR Planning Area with Water Quality Benefits

Figure 9-4

Legend

- Stormwater Projects
- Division between Western and Eastern Coachella Valley
- Colorado River
- Coachella and All American
- Whitewater River Stormwater Channel
- Coachella Valley Stormwater Channel
- Highways
- Water Bodies
- Dry Lakes
- Colorado River Funding
- IRWM / SWR Planning
- County Lines

Coachella Sub-watershed

- Fargo Canyon
- Garnet Hill
- Indio
- Miracle Hill
- Mission Creek
- Sky Valley
- Thousand Palms

Morongo Sub-watershed

- Morongo

San Gorgonio Sub-watershed

- Banning
- Cabazon

Shavers Sub-watershed

- Shavers

West Salton Sea Sub-watershed

- West Salton

0 1.75 3.5 7 10.5 14 Miles

N

Map Created: June 2018

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Water Supply Projects Analysis

Water supply benefits provided by stormwater projects can include: increased water supply reliability, conjunctive use, and water conservation. In order to calculate benefits obtained from conjunctive use or groundwater recharge, project proponents would rely on information such as soil type and permeability, precipitation volume, aquifer characteristics, and groundwater pumping. The total benefit to the IRWM/SWR planning area is evaluated in terms of total increase in water supply provided by stormwater projects.

SWRP projects submitted to the IRWM/SWR Plan project database plan to capture and use stormwater primarily through direct groundwater recharge during storm events. Stormwater capture and use projects increase groundwater supply and local supply reliability, which help the Region meet its water supply reliability and conjunctive use objectives. This includes IRWM Objectives A, B, D and I (further detailed in **Table 9-4)**.

At the time of IRWM/SWR Plan development, 12 projects had noted water supply benefits as either main or additional benefits of their stormwater projects. These projects included eight that will provide water supply reliability, four that will provide conjunctive use, and one that benefits water conservation efforts. Some projects marked multiple water supply benefits. The number of conceptual and ready to proceed projects that address these benefits is summarized in **Table 9-12**. The SWRP projects that will provide water supply benefits are identified in **Figure 9-5**.

Table 9-12: Water Supply Benefit Project Counts

Water Supply Benefits	Project Stage		Total
	Conceptual	Implementation	
Number of projects providing water supply reliability	8	0	8
Number of projects providing conjunctive use	4	0	4
Number of projects providing water conservation	1	0	1
Total number of projects providing water supply benefits	**12**	**0**	**12**

The East Side Dike Improvement Project, facilitated by CVWD, is currently the only project that has quantified increases in groundwater recharge through stormwater capture. The project estimates an increase in water supply through direct groundwater recharge of 10,000 acre-feet per year (AFY). The supply benefit is based on modeling of the 100-year peak flow and flow routes to estimate the recharge volume. The total supply benefit is summarized in **Table 9-13**. Other stormwater capture and use projects are included in the IRWM/SWR Plan but are not yet developed enough to have a quantified estimates of supply increase.

Table 9-13: Water Supply Quantified Benefits

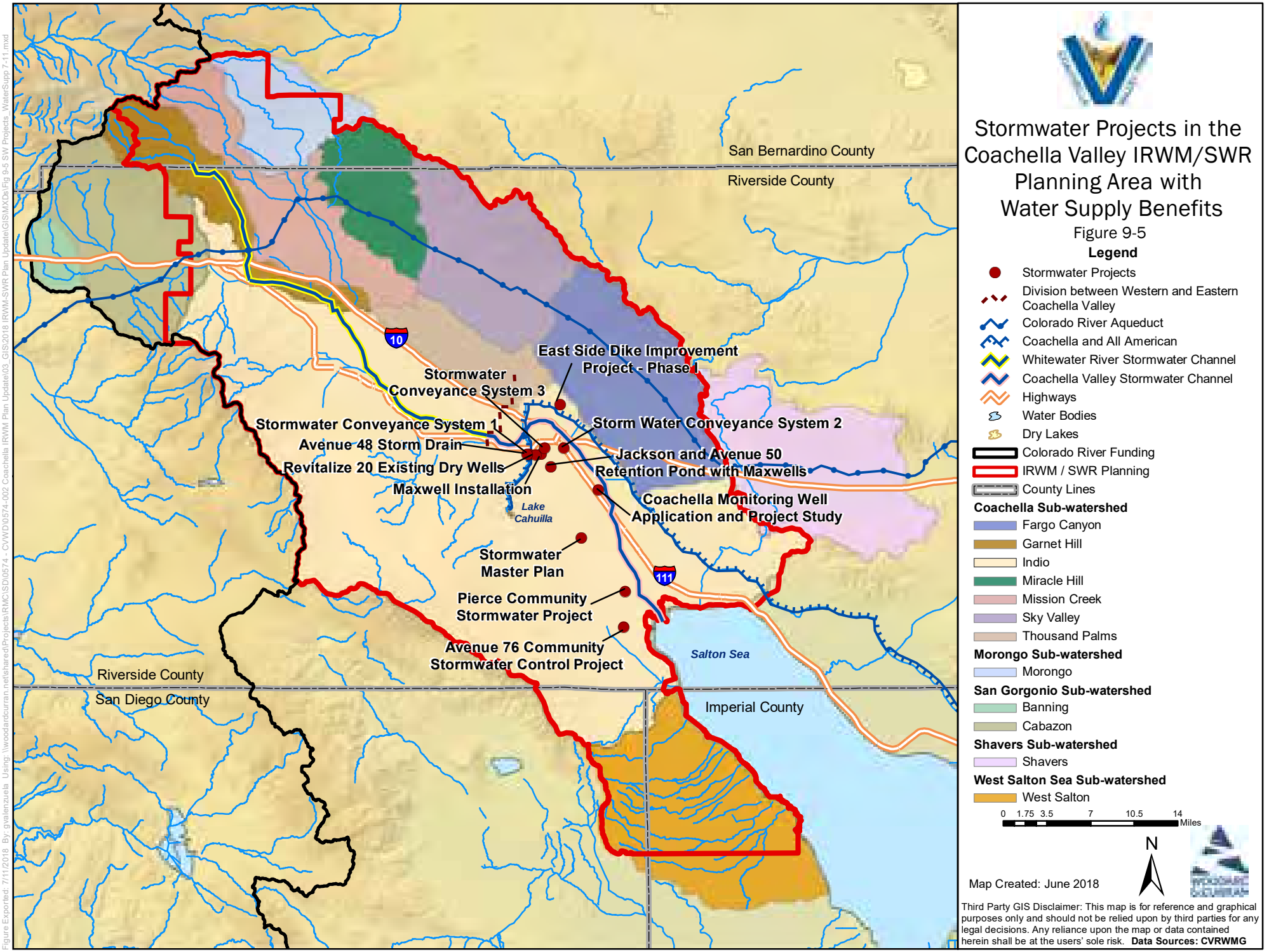
Water Supply Benefit	Total Quantified Benefit Over Watershed Area
Increase in water supply through direct groundwater recharge	10,000 AFY



Existing and Additional Project Opportunities

Stormwater and dry weather runoff management can provide significant supply benefits by capturing storm flows for beneficial use. Supply augmentation opportunities through groundwater recharge are of high importance in the Region since groundwater is the primary water supply source and flooding is an issue in many areas. Projects that use diversions, retention basins, dry wells, and other capture and infiltration BMPs can beneficially reuse nuisance stormwater to reduce flooding while providing local supply.

Several projects were identified in the IRWM/SWR Plan that provide supply augmentation through groundwater recharge. For example, the City of Indio has worked to infiltrate storm water for many years, according to an ordinance that requires stormwater infiltration as part of city planning. Currently, the City of Indio is planning on implementing three projects that will augment local water supply through groundwater recharge, using retention ponds and dry wells. In addition, the Coachella Water Authority (CWA) plans to develop a stormwater improvement plan that will establish capital improvement projects that will decrease urban runoff issues and increase conjunctive use. Further opportunities to capture and infiltrate stormwater for groundwater recharge exist near the CVSC and through the Indio/Whitewater River Subbasin area, and are assessed in the Integrated Flood Management Planning Study included as **Appendix VI-I**.



Stormwater Projects in the Coachella Valley IRWM/SWR Planning Area with Water Supply Benefits

Figure 9-5

Legend

- Stormwater Projects
- Division between Western and Eastern Coachella Valley
- Colorado River Aqueduct
- Coachella and All American
- Whitewater River Stormwater Channel
- Coachella Valley Stormwater Channel
- Highways
- Water Bodies
- Dry Lakes
- Colorado River Funding
- IRWM / SWR Planning
- County Lines

Coachella Sub-watershed

- Fargo Canyon
- Garnet Hill
- Indio
- Miracle Hill
- Mission Creek
- Sky Valley
- Thousand Palms

Morongo Sub-watershed

- Morongo

San Gorgonio Sub-watershed

- Banning
- Cabazon

Shavers Sub-watershed

- Shavers

West Salton Sea Sub-watershed

- West Salton

0 1.75 3.5 7 10.5 14 Miles

N

Map Created: June 2018

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Flood Management Projects Analysis

Flood management is a priority in the IRWM/SWR planning area. Stormwater capture project flood management benefits include decreased flood risk by reducing runoff rate and/or volume as well as reduced sanitary sewer overflows. These benefits can be quantified through measures such as peak flow reduction, flood volume reduction, or reduced sanitary sewer overflows. Project proponents may conduct hydraulic modeling in order to determine the project's impact on the overall storm drainage and/or sanitary sewer system. Detailed information on the relevant infrastructure or watershed features, such as location and capacity, would likely also be needed to quantify flood management benefits.

The majority of stormwater projects in the IRWM/SWR Plan provide flood management benefits addressing IRWM Objective H (further detailed in **Table 9-4**) as well as other benefits such as groundwater recharge and pollutant load reduction. All the flood management projects submitted to the SWR Plan are located in high risk areas prone to regional flooding in the eastern Coachella Valley as shown in **Figure 9-6**. As described in *Chapter 2 Region Description*, in the eastern Coachella Valley, infiltration is inhibited due to an aquitard, which is composed of impervious clay layers. These geophysical characteristics, when combined with lacking stormwater infrastructure, generate flood hazards during intense rainfall events.

At the time of IRWM/SWR Plan development, 15 applicants had noted flood management benefits as a main benefit to their stormwater projects. All these projects will address flood management issues by decreasing flood risk in reducing runoff rate and/or volume. In addition, CWA's Stormwater Master Plan will also identify potential projects to reduce sanitary sewer overflow volumes. The number of conceptual and ready to proceed projects that address flood management benefits is summarized in **Table 9-14**. The SWRP projects that will provide flood management benefits are identified in **Figure 9-6**.

Table 9-14: Flood Management Benefit Project Counts

Flood Management Benefits	Project Stage		Total
	Conceptual	Implementation	
Number of projects decreasing flood risk by reducing runoff rate/volume	13	2	15
Number of projects reducing sanitary sewer overflows	1	0	1
Total number of projects providing flood management benefits	**13**	**2**	**15**

The integrated analysis of quantified flood management benefits was based on three metrics dealing with the reduction in runoff rate and volume: reduction in peak flow discharge, reduction in the volume of potential flood water, and reduction in sewer overflow volumes. Hydrology models and studies were used by the project proponents to quantify the flood management benefits. For projects that quantified these flood management benefits, benefits were aggregated across the watershed to examine the reduction in peak flow discharge, the total reduction in potential flood volume, and the reduction in potential sewer overflow volume at different project sites. While the peak flow discharge benefit was site-specific, the flood and sewer overflow volume reductions could be aggregated with other nearby projects as additional projects with quantified benefits are submitted to the SWRP. A summary of the quantified benefits across the watershed are summarized in **Table 9-15**.

Many of these flood management projects also provide water supply benefits through the retention and infiltration of groundwater to reduce flood flows. The supply benefits of these projects are discussed in



more detail in the water supply analysis section. The multiple benefits provided by all the projects are illustrated in **Table 9-9**.

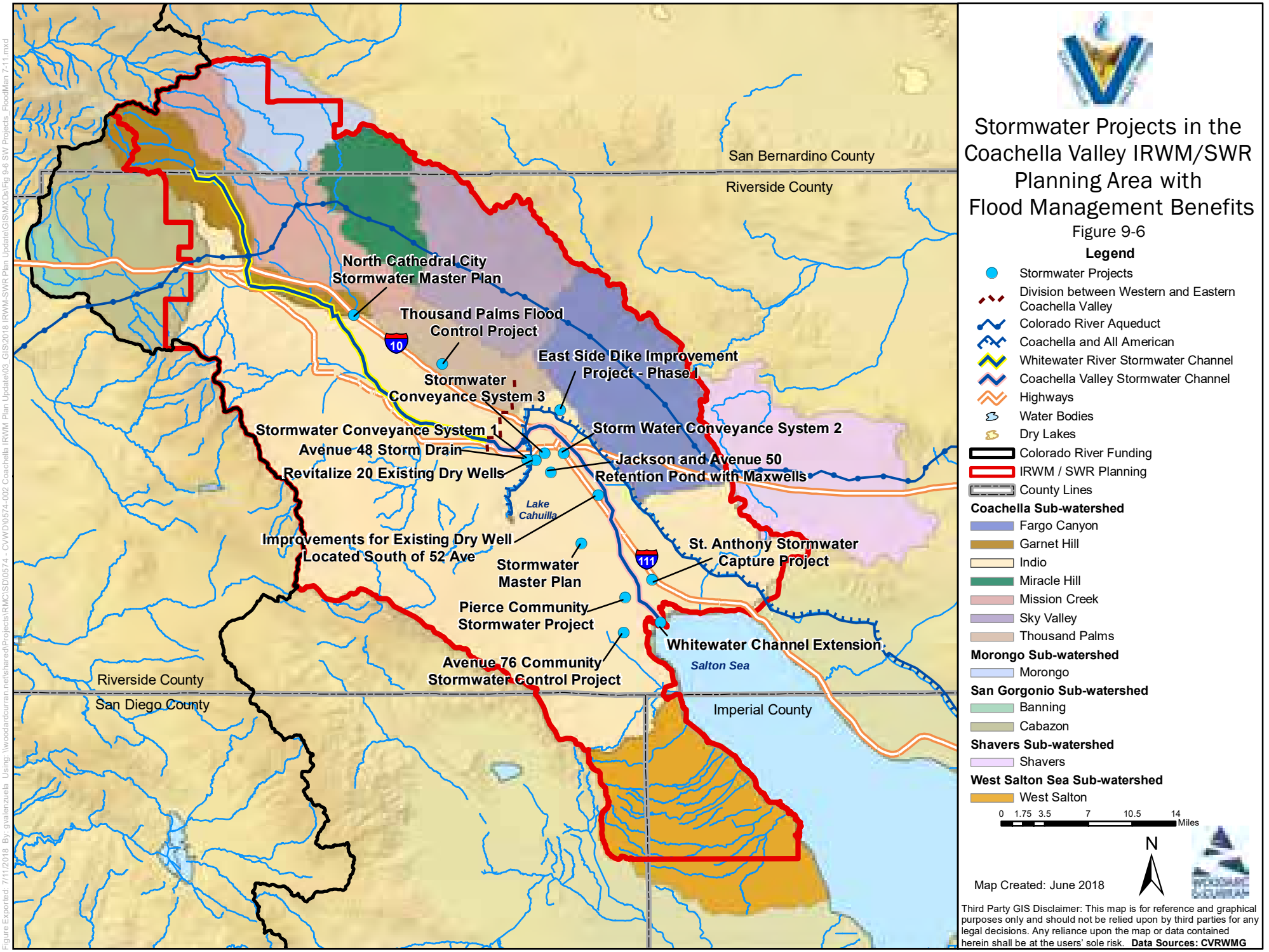
Table 9-15: Flood Management Quantified Benefits

Flood Management Benefit Metric	Total Quantified Benefit Over Watershed Area
Reduction in peak flow discharge	--
Thousand Palms Flood Control Project	19,000 cfs
North Cathedral City Stormwater Master Plan	36,000 cfs
East Side Dike Improvement Project – Phase I	12,000 cfs
St. Anthony's Stormwater Capture Project	33 cfs
Reduction in volume of potential flood water	3 AFY

Existing and Additional Project Opportunities

Additional project opportunities for multi-benefit integrated flood management were assessed in the Integrated Flood Management Planning Study included as **Appendix VI-I**. For the study, GIS mapping layers were used to screen the planning area for locations for the integrated flood management. The assessment looked for floodplain areas, highly permeable soils (hydrologic soil type A), areas overlying groundwater basins, areas with riparian vegetation or sensitive habitat area, and high sediment producing watershed areas. These initial mapping layers were overlaid to determine the locations where multiple occurrences of these five criteria occurred and were considered "opportunities." The more opportunities at a particular location then the more there was the possibility of achieving multiple flood management and water resources benefits (CVRWMG 2014).

Other considerations for flood management projects include opportunities to use existing publicly-owned lands and easements. Publicly owned lands can provide cost effective sites to implement stormwater projects, particularly larger-scale flood management and supply projects. There are several opportunities in the Region to use existing publicly owned lands such as parks, public open space, community gardens, farm and agricultural preserves, school sites, and government office buildings and complexes, to capture, clean, store, and use stormwater and dry weather runoff either onsite or offsite. For example, the Thousand Palms Flood Control Project would construct a series of levees and channels on public lands to protect a portion of the Thousand Palms and North Cathedral City from flooding. Projects that utilize public lands are included in the project list in **Appendix VI-H**.



Stormwater Projects in the Coachella Valley IRWM/SWR Planning Area with Flood Management Benefits

Figure 9-6

Legend

- Stormwater Projects
- Division between Western and Eastern Coachella Valley
- Colorado River Aqueduct
- Coachella and All American
- Whitewater River Stormwater Channel
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Coachella Sub-watershed

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- Cabazon

Shavers Sub-watershed

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- West Salton

0 1.75 3.5 7 10.5 14 Miles

N

Map Created: June 2018

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Environmental Benefits Analysis

Environmental benefits provided by stormwater projects include improvements such as habitat protection and improvement, increased urban natural landscape and pervious surfaces, or reduced energy use, greenhouse gas (GHG) emissions or provides a carbon sink, reestablishment of the natural hydrograph, or water temperature improvements. Quantification methods used by project proponents for these benefits can vary due to the diversity of the benefits. A benefit such as increased urban green space may be relatively simple to calculate based on project design information. To calculate GHG emission reduction, a project proponent may need to determine the energy usage of the project compared to the existing conditions, the emissions factor for any energy sources, and estimates for carbon sequestration potential.

Stormwater projects in the planning area primarily provide habitat protection or improvement benefits in addition to flood management or water quality benefits. These stormwater projects will help the Region address environmental water management objectives (see **Table 9-4)** by improving habitat and increasing open space. Projects such as the St. Anthony Stormwater Capture Project will increase natural landscape and pervious surfaces in the watershed, while several flood management projects provide opportunities to protect or enhance habitat and open space and provide benefits to special status species. The Thousand Palms Flood Control Project, for example, will construct a series of levees and channels that will maintain a sand transport system for the Coachella Valley Fringe-Toed Lizard Preserve. Additionally, the North Cathedral City Stormwater Master Plan will construct improvements to convey a portion of the 100-year flood from the Morongo Wash to the Whitewater River Stormwater Channel (WRSC) which will improve wildlife connectivity and sand transports between the Willow Hole and Whitewater Floodplain Conservation Areas.

At the time of IRWM/SWR Plan development, nine projects had noted environmental benefits as main benefits to their stormwater projects. These projects included eight that will provide environmental habitat protection and improvement, and two that will increase urban natural landscape and pervious surfaces. Some projects marked both as benefits. The number of conceptual and ready to proceed projects that address environmental benefits is summarized in **Table 9-16.** The SWRP projects that will provide environmental benefits are identified in **Figure 9-7**.

Table 9-16: Environmental Benefit Project Counts

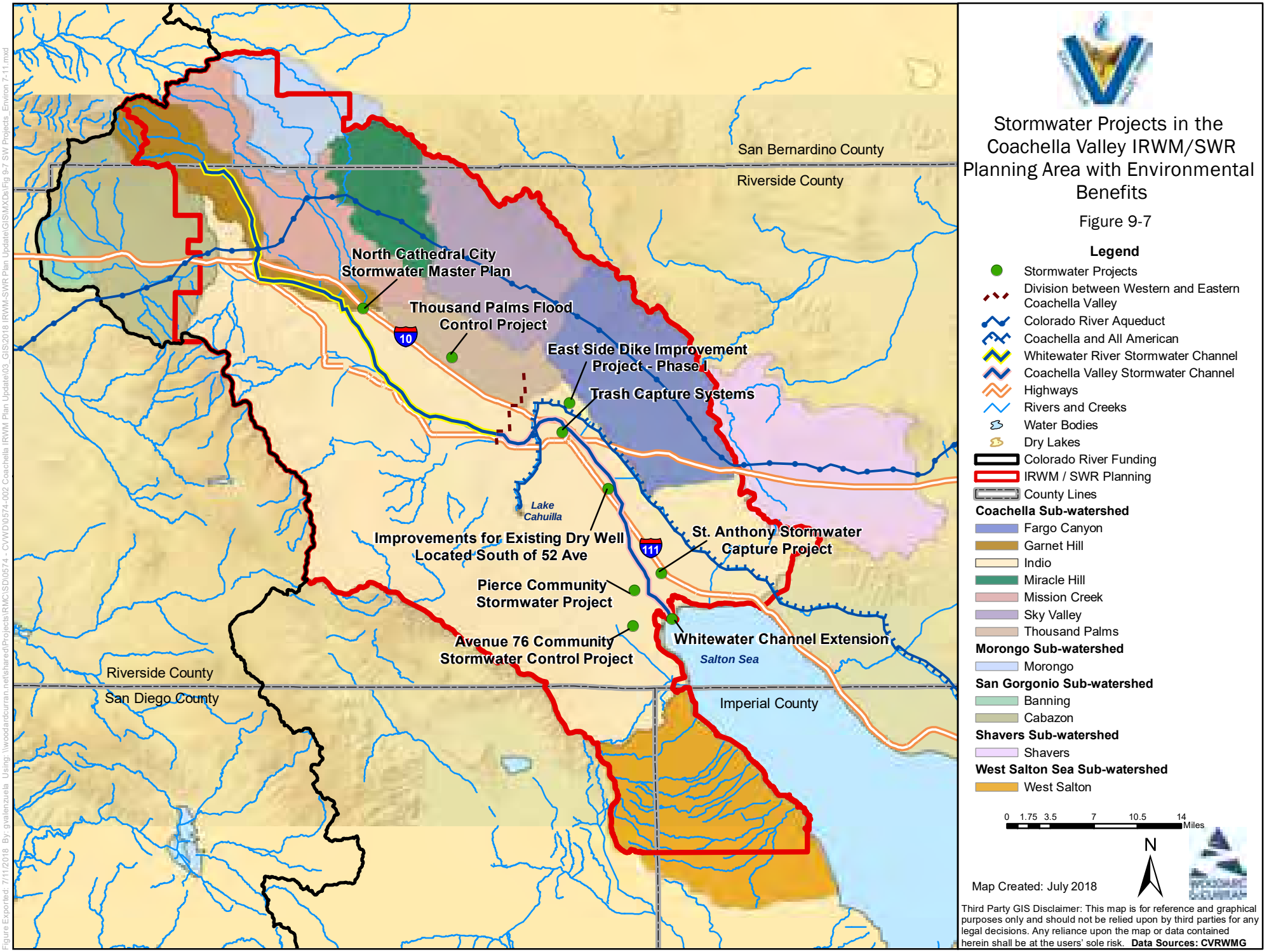
Environmental Benefits	Project Stage		Total
	Conceptual	Ready to Proceed	
Number of projects providing environmental habitat protection and improvement	7	1	8
Number of projects providing increased urban natural landscape and pervious surfaces	1	1	2
Total number of projects providing environmental benefits	**7**	**2**	**9**

Projects submitted to the IRWM/SWR Plan quantified environmental benefits utilized two metrics: the area of habitat protected or improved by the project and the area of increase in urban natural landscape and pervious surfaces created by the project. **Table 9-17** summarizes the total acreages of improved habitat and increased natural landscape and pervious surfaces that will result in the watershed through implementing the projects.



Table 9-17: Environmental Quantified Benefits

Environmental Benefit Metric	Total Quantified Benefit Over Watershed Area
Size of habitat protected or improved	49,890 acres
Size of increase in urban natural landscape and pervious surfaces	2 acres



Stormwater Projects in the Coachella Valley IRWM/SWR Planning Area with Environmental Benefits

Figure 9-7

Legend

- Stormwater Projects
- Division between Western and Eastern Coachella Valley
- Colorado River Aqueduct
- Coachella and All American
- Whitewater River Stormwater Channel
- Coachella Valley Stormwater Channel
- Highways
- Rivers and Creeks
- Water Bodies
- Dry Lakes
- Colorado River Funding
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- Thousand Palms

Morongo Sub-watershed

- Morongo

San Gorgonio Sub-watershed

- Banning
- Cabazon

Shavers Sub-watershed

- Shavers

West Salton Sea Sub-watershed

- West Salton

0 1.75 3.5 7 10.5 14 Miles

N

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Community Benefits Analysis

Community benefits can include employment opportunities, public education, community involvement, and enhance and/or create recreational and public use areas. These benefits can be quantified using metrics such as number of jobs created, number of community participants, or number of outreach materials distributed. Community benefits are often formulated during the planning phases of projects. Quantification of community benefits would rely on organizer experience, rather than the types of modeling approaches typical for other benefit types.

Several projects and programs in the IRWM/SWR planning area include community benefits as part of stormwater project implementation. For example, the St. Anthony Stormwater Capture Project aims to enhance communities and public space while providing stormwater capture and infiltration benefits. Providing outreach materials, conducting public events and involving the local community in stormwater programs is an important component of stormwater project implementation. These project components will help the Region address its IRWM Objectives, including Objectives J, K, L, and M (further detailed in **Table 9-4)**.

At the time of IRWM/SWR Plan development, six projects had noted community benefits as either main or additional benefits to their stormwater projects. These projects included two that will provide employment opportunities, five that will provide public education, four that will contribute to community involvement, and five that will enhance and/or create recreational and public use areas. Some projects marked multiple community benefits. The number of conceptual and ready to proceed projects that address community benefits is summarized in **Table 9-18**. The SWRP projects that will provide community benefits are identified in **Figure 9-8**.

Table 9-18: Community Benefit Project Counts

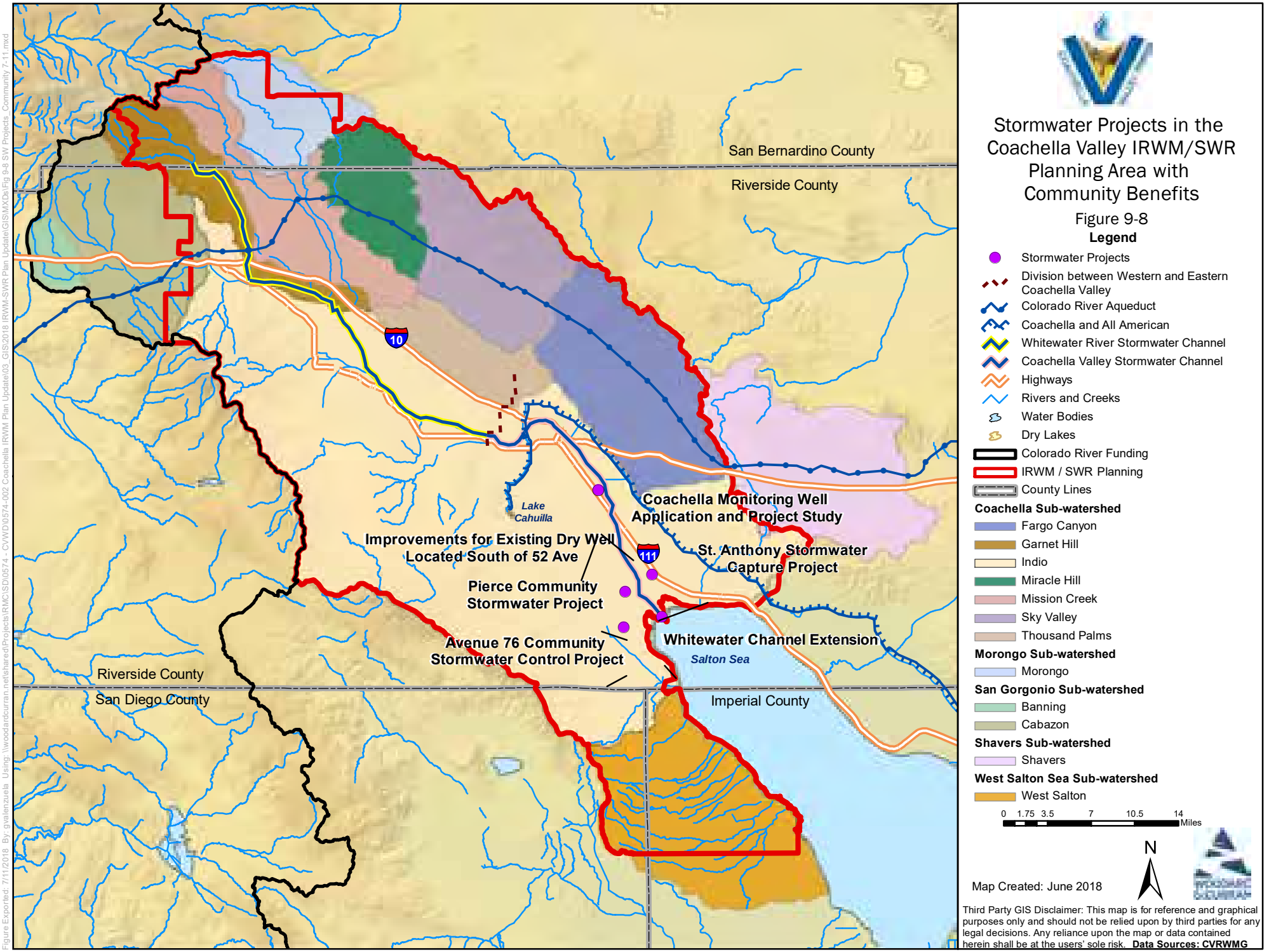
Community Benefits	Project Stage		Total
	Conceptual	Implementation	
Number of projects providing employment opportunities	2	0	2
Number of projects providing public education	3	2	5
Number of projects providing community involvement	3	1	4
Number of projects enhancing/creating recreational and public use areas	3	2	5
Total number of projects providing community benefits	**4**	**2**	**6**

Some community benefits were quantified as part of the project submittal process using three metrics concerning public education, community involvement, and public recreational areas. **Table 9-19** summarizes the collective quantified community benefits over the watershed based on the submitted projects.



Table 9-19: Community Quantified Benefits

Community Benefit Metric	Total Quantified Benefit Over Watershed Area
Number of outreach materials provided or public education events conducted	20 outreach materials or events conducted
Number of community involvement participants per year	549 participants
Estimated visits per year to enhanced/created public recreational areas	240 visits



Stormwater Projects in the Coachella Valley IRWM/SWR Planning Area with Community Benefits

Figure 9-8

Legend

- Stormwater Projects
- Division between Western and Eastern Coachella Valley
- Colorado River Aqueduct
- Coachella and All American
- Whitewater River Stormwater Channel
- Coachella Valley Stormwater Channel
- Highways
- Rivers and Creeks
- Water Bodies
- Dry Lakes
- Colorado River Funding
- IRWM / SWR Planning
- County Lines

Coachella Sub-watershed

- Fargo Canyon
- Garnet Hill
- Indio
- Miracle Hill
- Mission Creek
- Sky Valley
- Thousand Palms

Morongo Sub-watershed

- Morongo

San Gorgonio Sub-watershed

- Banning
- Cabazon

Shavers Sub-watershed

- Shavers

West Salton Sea Sub-watershed

- West Salton

0 1.75 3.5 7 10.5 14 Miles

N

Map Created: June 2018

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Figure Exported: 7/11/2018 By: gvalenzuela Using: \\woodardcurran.net\shared\Projects\RMC\SD\0574 - CVWD\0574-002 Coachella IRWM Plan Update\03_GIS\2018 IRWM-SWR Plan Update\GIS\MXDs\Fig 9-8 SW Projects_Community 7-11.mxd

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