APPENDIX J. INDIVIDUAL GSA PROJECTS AND MANAGEMENT ACTIONS

Arvin GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 99 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

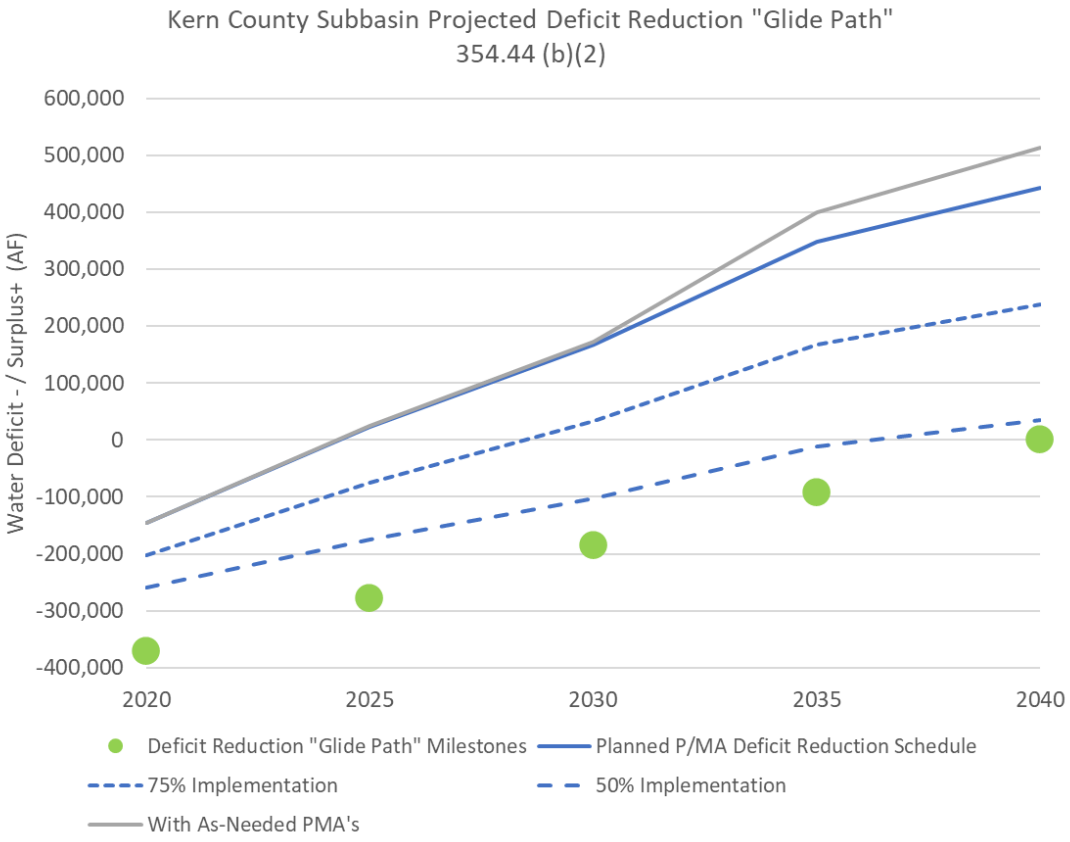


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

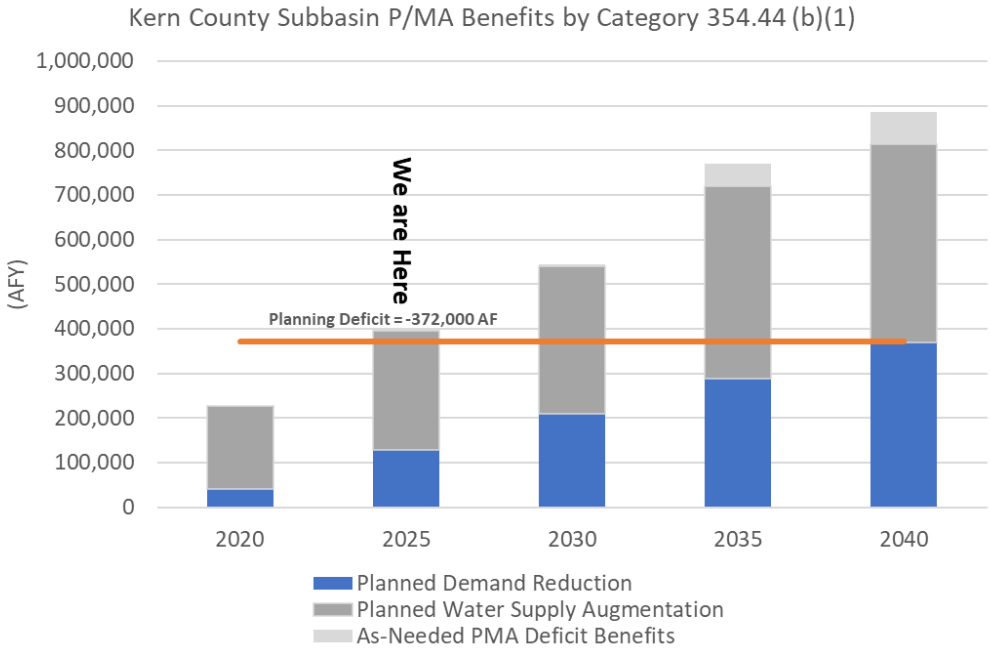


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Arvin GSA

☑ 23 CCR § 354.42(d)

Arvin-Edison Water Storage District's historical efforts to achieve a balanced and sustainable water supply for all lands, including to both the Surface Water Service Area and the Groundwater Service Area, and in an equitable manner, will continue under SGMA. As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Arvin GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (6,705 AFY) of the projected deficit of 26,820 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2030.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Arvin GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-26,820			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-6,705**	**-13,410**	**-20,115**	**-26,820**
Deficit Reduction "Glide Path" Milestones		**-26,820**	**-20,115**	**-13,410**	**-6,705**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	1,446	2,110	7,220	12,220	12,220
	Demand Reduction					
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**1,446**	**2,110**	**7,220**	**12,220**	**12,220**
Planned Water Supply Augmentation	Supplemental Water Recharge	2,282	11,586	15,690	15,690	15,690
	Supplemental Water Use	760	8,250	14,650	19,650	24,650
	Third-Party Banking					
	New Local Supply			150	150	1,700
	Exercise of Rights		6,500	6,500	6,500	6,500
	Subtotal	**3,042**	**26,336**	**36,990**	**41,990**	**48,540**
P/MA Implementation Schedule*		**4,488**	**28,446**	**44,210**	**54,210**	**60,760**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**-22,332**	**1,626**	**17,390**	**27,390**	**33,940**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

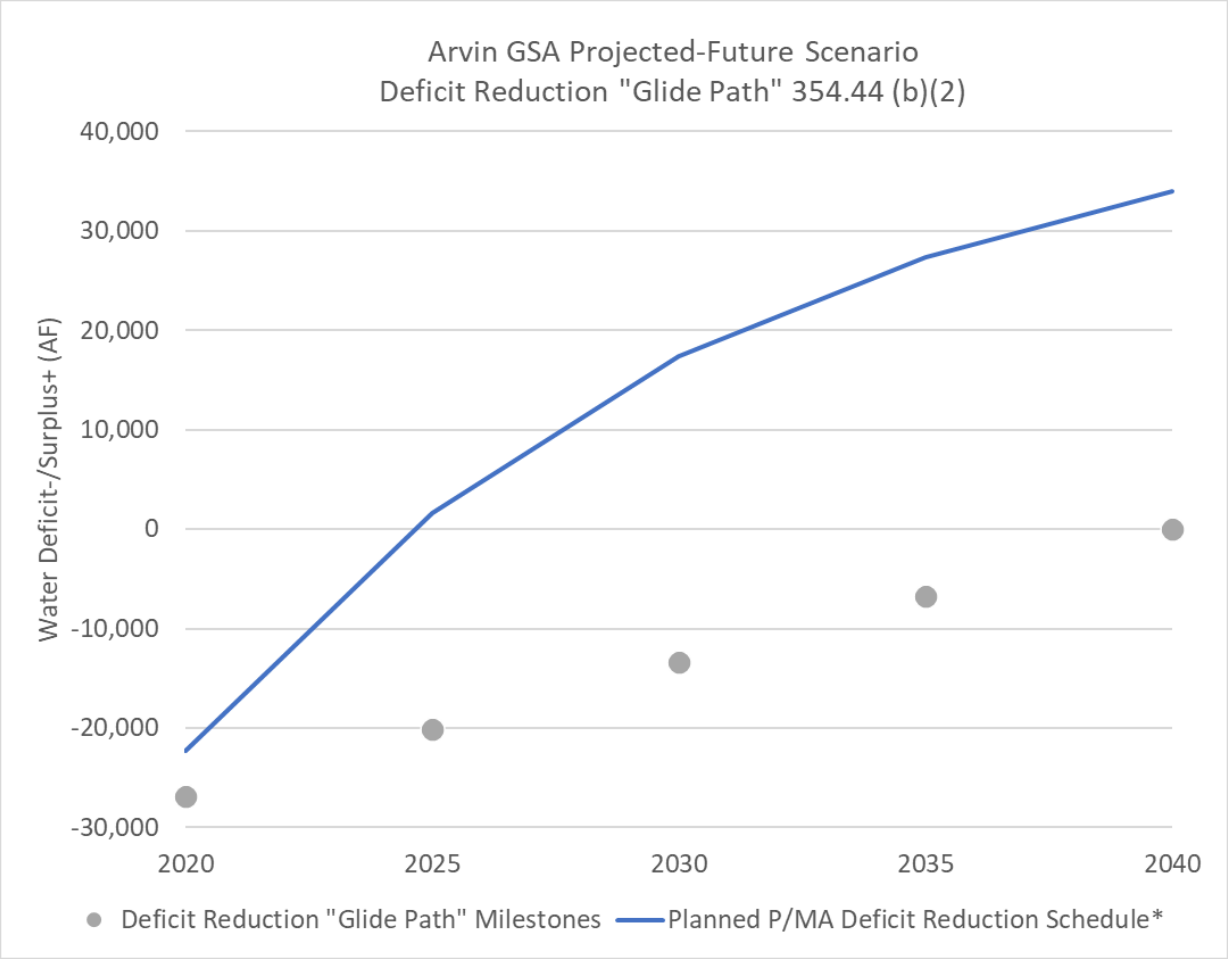


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example AE-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed					
AE-1	**ACSD Well #12 Construction**	This project would drill a new well to replace a well that is considered at risk of contamination due to its proximity to the Brown and Bryant Superfund Site. The new well (No. 12) is being drilled concurrently with the Arsenic Mitigation Project Phase II and will allow ACSD to bring four new wells online in addition to Well No. 13 and 14 brought online in July of 2016.		✓			Underway	Public meetings, direct mail	Title 22 Drinking Water Regulations	**Complete**	Complete	Complete	2019-	**0**	**0**	✓					NA	None	$2,250,000	NA	ACSD
AE-2	**On-Farm Recharge**	The program encourages individual growers to perform on-farm recharge for individual and aggregated benefits. Water may be recharged on-farm in private basins and/or distributed through irrigation systems across irrigated acreage in excess of current crop ET.	✓			Supplemental Water Recharge	Underway	No public notice required for implementation; outreach and education will expand program.	NA	**Starting in 2023, provided financial incentives to landowners to conduct on-farm recharge; 13,317 AF recharged to the Kern Subbasin in 2023.**	Ongoing	Ongoing; implemented beginning in 2019	2023-	**5300**	**0**	✓	✓	✓			Local stormwater	None	NA	NA	Private; if required
AE-3	**Emergency 1,2,3-TCP Treatment Well #12 (EPA Replacement CW-1)**	The project involves the installation of emergency 1,2,3-TCP treatment at the well head. The work will include installation of a skid mounted treatment system with two granular activated carbon media vessels for removal of 1,2,3-TCP, connection to the existing well discharge piping, installation of below ground and above ground influent and effluent piping and appurtenances, electrical and controls, and modifications to the existing well site PLC programming.		✓			Underway	Public meetings, direct mail	Title 22 Drinking Water Regulations	**Well #12 was completed and commissioned in May of 2021.**	Complete	Completed May 2021	2021-	**0**	**0**	✓					NA	None	$1,600,000	TBD	ACSD
AE-4	**Forrest Frick Pipeline / KDWD Eastside Canal Intertie**	This project connects the Forrest Frick Pipeline to the KDWD Eastside Canal to send AEWSD SW supplies through KDWD to serve portions of the AEWSD GWSA with temporary water contracts, utilizing existing infrastructure (turnouts, pipelines that are both District and landowner owned). With the District's new 9(d) contract, certain provisions of Reclamation law are no longer applicable and all lands within the service area can now be served with federal water supplies.	✓	✓		Supplemental Water Use	Underway	Infrastructure improvement; no public noticing necessary	CEQA; NEPA; County encroachment permits	**Deliveries began in February 2023**	Complete	Construction completed in February 2023	2023-	**1,900**	**0**	✓	✓	✓			Additional wet-year imported water supplies	None	$1,000,000	TBD	AEWSD General Fund, USBR grant
AE-5	**Arsenic Mitigation Project - Phase II**	The purpose of the project is to bring the ACSD water system into compliance for Arsenic. All five of the ACSD active wells exceed the maximum contaminant level (MCL) of 10 ppb for Arsenic. The project was separated into two phases. Phase II involves drilling three new wells, constructing a 1.0 MG storage tank and booster pumping plant, and connecting the facilities to the existing distribution system. The original five (5) water wells will then be abandoned and destroyed in accordance with Kern County Standards.		✓			Underway	Public meetings, direct mail	Title 22 Drinking Water Regulations	**Well #18 completed December 2023; all other project components complete**	Complete	December 2023	2024-	**0**	**0**	✓					NA	None	$14,200,000	TBD	ACSD
AE-6	**Private & Caltrans Basin Connections**	This project involves the construction of pipelines to connect several on-farm private basins and Caltrans sumps near AEWSD to utilize for groundwater recharge.	✓			Supplemental Water Recharge	Grant funding	Infrastructure improvement; no public noticing necessary	Caltrans permitting; CEQA if longer pipeline connections are required	**Several Cal Trans basins have been connected to AEWSD and are currently taking surface water for recharge**	Ongoing	Ongoing	2023-	**270**	**0**	✓	✓	✓			Additional wet-year imported water supplies; Local stormwater	None	$500,000	NA	AEWSD General Fund; grants

AE-31	**Exercising Existing Water Rights**	The USBR, SLDMWA, FWA, and SJREC have entered into a MOU to collectively identify projects and potential actions aimed at improving drought resliency south of the Delta, including AEWSD deliveries from the FKC. The South of Delta Drought Resiliency Framework allows participating entities to voluntarily conserve and securely store a portion of their CVP south of Delta deliveries for subsequent use with the goal of providing at least a 5% allocation to CVP south of Delta agricultural water service/repayment contracts, reducing reliance on Delta exports in drought years.	✓			Exercise of Rights	Underway	NA	NA	**MOU effective March 2024**	2023	2024	2024-	**2000**	**0**			✓			Increased reliability of AEWSD's CVP supplies	Signed MOU	$0	$0	AEWSD General Funds
AE-7	**AEWSD Sunset Spreading Works**	The Sunset Spreading Works, approximately 150 acres, is located on the boundary between AEWSD and KDWD, adjacent to KDWD's Eastside Canal. The Project takes surface water (Federal CVP, State Water Project, or local supplies) diverted through KDWD's Eastside Canal and recharges the surface supplies as part of AEWSD's and KDWD's joint water management programs. The Project included the construction of exterior and interior dikes for a direct recharge facility, a new turnout and pump station from the KDWD Eastside Canal, and interbasin structures.	✓	✓		Supplemental Water Recharge	Underway	Infrastructure improvement; no public noticing necessary	KDWD encroachment permit; CEQA; NEPA if federal funds are used	**Project construction is anticipated to be complete in Spring 2024; Early deliveries began in February 2023 using mobile temporary pumps**	Underway	Spring 2024	2023-	**4920**	**410**	✓	✓	✓			Additional wet-year imported water supplies	None	$7,330,000	TBD	AEWSD General Fund (50%), KDWD (50%)
AE-8	**DiGiorgio Unit In-Lieu Storage Program**	The District will supply SW when available through new facilities to the GWSA to meet its water requirements with the intent of reducing District-wide GW use. However, when SW is in short supply and under agreement, the landowners could recover and return GW from their own wells to the District canal system through new pipelines once they have satisfied their own water needs.	✓	✓		Supplemental Water Use	Grant funding	Infrastructure improvement; no public noticing necessary	CEQA; NEPA requirements if grant funds are used; PWRPA; possible Kern County encroachment permits	**Phase 2a construction anticipated to be complete in Fall 2024; funded through portion of a $25M loan to AEWSD**	Future Phases initiated upon grant funding	Phase 2a completion: Fall 2024	2025-	**4250**	**0**	✓					Additional wet-year imported water supplies	None	$17,000,000	TBD	AEWSD General Fund
AE-9	**Frick Unit In-Lieu Project**	This project would increase the ability of the District to provide surface water supplies to the Groundwater Service Area (GWSA) to help meet crop irrigation requirements. With the Project, the District will supply surface water when available through new facilities to the GWSA to meet crop irrigation requirements with the intent of reducing District wide groundwater use.	✓	✓		Supplemental Water Use	Grant funding	Infrastructure improvement; no public noticing necessary	CEQA; NEPA requirements if grant funds are used; PWRPA; possible Kern County encroachment permits	**$2M from the IRWM Round 2 grant awarded**	Upon grant funding	2025	2026-	**3500**	**0**	✓					Additional wet-year imported water supplies	None	$16,000,000	TBD	AEWSD General Fund, IRWM Grant
AE-10	**Expansion of North Canal Spreading Works**	The Project will convert approximately 160 acres of permanently cropped agricultural lands into additional groundwater recharge facilities as part of the District's existing North Canal Spreading Works. The Project water supply benefits include approximately 500 AFY due to the land use change (vineyards and almond orchards to basins), plus an average annual recharge benefit of 5,200 AFY (or 13,000 AF in an unconstrained year).	✓	✓		Supplemental Water Recharge	Underway	CEQA, NEPA	CEQA, NEPA	**Planning and design underway; construction anticipated to begin in October 2025 and last 6 months**	Underway	2025	2026-	**5200**	**500**	✓	✓	✓			Additional wet-year imported water supplies	None	$4,300,000	TBD	AEWSD General Fund; DWR grant
AE-11	**AEWSD South Canal Flood Study / Improvements**	The South Canal Flood Study would review and possibly revise the FEMA floodplain in this area in order to increase the height of the canal bank to provide additional operational freeboard and accordingly reduce the potential for canal spills and subsequent flooding. The additional canal storage could allow for the caputure and use of additional floodwater in-lieu of groundwater pumping.	✓			New Local Supply	Grant funding	Infrastructure improvement; no public noticing necessary	NA	**Initiated the South Canal Flood Study, including identification of potential grant funding sources**	Study initiated upon GSP adoption	Study approx. 1 year; construction approx. 1 year	2030-	**150**	**0**		✓	✓			Local stormwater	None	$2,300,000	NA	AEWSD General Fund

AE-12	**Conversion of Granite Quarry to Sycamore Ranch**	The Granite Co. quarry, located upstream of the Sycamore Spreading Basins, is approaching the end of its operational life and could be converted into a balancing / detention / spreading reservoir. Excess flows in the North Canal could be pumped into the quarry reservoir, so the detained water could be recirculated for irrigation demands in-lieu of groundwater pumping and/or recharged.	✓	✓		Supplemental Water Use	To be implemented upon adoption of GSP / Grant funding	Infrastructure improvement; no public noticing necessary	CEQA; DMR SMARA permit closure; NEPA requirements if grant funds are used	**Geotechnical study complete; AEWSD and TCWD have participated in several meetings to discuss the permitting process for this project**	TBD	Construction duration TBD	2030-	**0**	**0**	✓		✓			Additional wet-year imported water supplies	Property acquisition or land use agreement with quarry owner	$15,000,000	TBD	AEWSD General Fund, TCWD
AE-13	**AEWSD Wasteway Basin Improvements**	The primary use of the existing AEWSD Wasteway Basin is to provide emergency water storage in the event of power failure. Additionally, it works as a detention facility for the City of Bakersfield stormwater. This project would include construction of a HDPE liner along the levees, installation of recirculation pumps, and basin grading. These improvements would allow the basin to serve as a location to divert and clarify sediment.	✓			New Local Supply	Project to be implemented upon FEMA grant approval.	Infrastructure improvement; no public noticing necessary	SJVAPCD Dust Control & SWPPP; NEPA Cultural Resources	**AEWSD continues to seek grant funding for this project.**	Upon grant funding	Construction duration: 3 years	2040-	**1550**	**0**		✓	✓			Stormwater from Bakersfield storm sewer system	None	$2,500,000	$32,000	AEWSD General Fund
AE-14	**General Temporary Water Program**	The Temporary Water Program consists of suppling surface water to landowners that previously relied only on groundwater (GWSA). New infrastructure would have to be built to facilitate the implementation of this program.	✓	✓		Supplemental Water Use	Grant funding	Infrastructure improvement; no public noticing necessary	CEQA; NEPA requirements if grant funds are used; PWRPA; possible Kern County encroachment permits	**Imported and delivered surface water to contracted and noncontracted lands; Sandrini Unit (i.e., Tejon Expansion) under design; Development of a potential hybrid in-lieu and temporary water service contract is underway and landowner outreach for the new areas will begin soon.**	Upon grant funding	2030	2030-	**15000**	**110**	✓					Additional wet-year imported water supplies	None	$10,000,000	TBD	AEWSD General Fund
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasiblity Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	AEWSD General Fund (Study only)
AE-32	**Capture of Imported Water Return Flows from White Wolf Subbasin**	AEWSD has provided imported water deliveries to landowners within the White Wolf Subbasin. Return flows of imported water flow across the White Wolf Fault into Arvin GSA. Arvin GSA would capture the proportion of Subbasin inflows attributed to AEWSD's imported water return flows for distribution and use within the surface water service area.	✓			Exercise of Rights	Underway	GSA Board meetings	NA	**Arvin GSA has initiated discussions and negotiations with Subbasin GSAs and White Wolf GSA**	2024	2025	2025-	**4500**	**0**						Imported water return flows	None	$0	$0	NA
AE-15	**Sycamore Creek Detention & Sedimentation Basin**	The proposed basin would serve to intercept sediment from Sycamore creek flows to prevent constriction where sediment deposits downstream, reduce the peak outflow, and prevent the likelihood of a canal and spreading basing breach. Detained water could be recirculated for irrigation demands or recharged for groundwater supply augmentation.	✓	✓		Supplemental Water Recharge	Grant funding	Infrastructure improvement; no public noticing necessary	County grading permit; NEPA if federal grant funds used; SMARA (potentially)	**Not yet Initiated**	Upon grant funding	Construction duration: approx. 2 years	1-3 years after construction	**250**	**0**		✓				Local stormwater	None	$3,000,000	$30,000	AEWSD; potential grants
AE-16	**Stormwater Management and Flood Control Improvements**	Potential construction of new sedimentation/detention basins, flood ditch erosion protection, Spillway Basin expansion, lengthening the South Canal's siphon under David Road or extension of the South Canal liner through designated floodplain reaches.	✓	✓		Supplemental Water Recharge	Grant funding and completion of feasibility study	Infrastructure improvement; no public noticing necessary	Permits: TBD; NEPA requirements if funds are granted	**Not yet Initiated**	TBD upon available funding; excessive flooding or further damages may expedite initiation	Construction duration: approx. 1 year	1-3 years after construction	**TBD**	**0**	✓	✓				Local stormwater	None	TBD	TBD	AEWSD and partnering agencies

AE-17	**Caliente Creek Habitat Mitigation and Groundwater Recharge**	Restoration of agricultural lands to native vegetation to provide flood mitigation. Two alternatives are being considered, of which Alternative 1 is partial agricultural and 2 is non-agricultural.	✓			Supplemental Water Recharge; Land Retirement	Grant funding	CEQA, NEPA	CEQA; NEPA (if federal funds used); SWRCB Waste Discharge Requirements; CDFW Agreement; Determination of consistency with VFHCP	**Not yet Initiated**	TBD; upon grant funding	TBD	Immediately following construction	**TBD**	**TBD**		✓				Local stormwater	None	$3,000,000	TBD	AEWSD; potential grants
AE-18	**AEWSD Intake Canal / KDWD Farmer's Canal Intertie**	Improvement of existing and/or construction of new interties between AEWSD Intake Canal and KDWD's Farmer's Canal to facilitate water exchanges between the two districts and Kern County partners.	✓			Supplemental Water Use	Completion of feasibility study	Infrastructure improvement; no public noticing necessary	None (CEQA exempt under 15301 and 15303)	**Not yet Initiated**	TBD	Construction duration: approx. 1 year	1 year after construction	**4000**	**0**			✓			Additional wet-year imported water supplies	None	$2,000,000	$20,000	AEWSD General Fund; KDWD
AE-19	**AEWSD North Canal Balancing Reservoir Expansion & Discharge Pipelines**	The proposed project will consist of the installation of a pipeline system that will convey flows from the four (4) wells within the AEWSD Balancing Reservoir directly to the basin discharge structure and no longer through the basin low flow channels. Infiltration and evaporation losses on well discharge flows will be eliminated and power efficiency for the wells (kwh/af) will be significantly enhanced since all water pumped will be discharged into the North Canal.	✓			Supplemental Water Recharge; Demand Reduction	Completion of feasibility study	Infrastructure improvement; no public noticing necessary	None	**Not yet Initiated**	Upon grant funding	Construction duration TBD	1-3 years after construction	**100**	**40**			✓			Additional wet-year imported water supplies	None	$300,000	TBD	AEWSD; potential grants
AE-20	**AEWSD Lateral Capacity Improvement Projects**	Increase delivery capacity of the AEWSD N-55 lateral system. Some examples of the actions considered for this project are: replacement of lateral system and landowner pipelines, renovation of storage tanks, construction of pump stations, etc.	✓			Supplemental Water Use	Grant funding/Completion of feasibility study	Infrastructure improvement; no public noticing necessary	Permits: TBD; NEPA requirements if funds are granted	**Not yet Initiated**	TBD	Construction duration TBD	TBD	**1000**	**0**			✓			Additional wet-year imported water supplies	None	$15,000,000	TBD	AEWSD General Fund
AE-21	**AEWSD South Canal Balancing Reservoir**	Creation of a reservoir to allow water storage for flow mismatches in the AEWSD canal system during operation or emergencies. Depending on the location, this reservoir would increase storage capacity by ~500 AF.	✓			Supplemental Water Use	Grant funding, South County flooding response	Infrastructure improvement; no public noticing necessary	TBD	**Not yet Initiated**	TBD	Construction duration TBD	TBD	**500**	**190**			✓			Additional wet-year imported water supplies	None	$5,000,000	$5,000	AEWSD General Fund
AE-22	**Reclamation of Oilfield Produced Water**	Reclaiming water from oil production facilities for irrigation purposes is currently an untapped water source in AEWSD. After treatment and cooling, produced water could be pumped into AEWSD facilities to serve irrigation demands in-lieu of groundwater pumping.	✓	✓		New Local Supply	To be implemented upon adoption of GSP / agreement with partnering oil field	Public meetings	TBD	**Not yet Initiated**	Upon agreement with oil field producers	TBD	1 year after agreement	**1000**	**0**						Oil field produced water	None	TBD	TBD	AEWSD and partnering oilfield
AE-23	**Wastewater Reclamation with City of Arvin & Bakersfield**	Reclaiming water from Cities of Arvin and Bakersfield wastewater treatment facilities for irrigation purposes is currently an untapped water source in AEWSD. After wastewater treatment, the effluent could be pumped into AEWSD facilities to serve irrigation demands in-lieu of groundwater pumping.	✓			New Local Supply	To be implemented upon adoption of GSP / agreement with City of Arvin and City of Bakersfield	Public meetings	City encroachment permits; SWRCB Waste Discharge Requirements	**Not yet Initiated**	Upon agreement with cities	TBD	1 year after agreement	**10000**	**0**						Wastewater from Cities of Arvin and Bakersfield	None	TBD	TBD	AEWSD and partnering cities

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary								One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility /	Mitigation Programs	Basin Gap Filling/ Monitoring					
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed							
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.		✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	AEWSD General Fund
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	AEWSD General Fund
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	AEWSD General Fund
AE-24	Groundwater Extraction Quanticiation Method	Application of a new policy to specify an approved method to quantify the individual and aggregated groundwater extractions for the required SGMA annual reporting. Some methods to consider (or a combination of them) are the following: (1) Irrigated Acreage determined by aerial imagery; (2) Irrigated area hybrid determined by annual crop survey alongside aerial imagery; (3) Calibrated energy records; (4) Volumetric flow measurement; (5) Remote sensing of evapotranspiration; (6) Other.	✓		✓		Underway	District flyers, direct mail, public meetings	None	**AEWSD completed their district-specific groundwater flow model and decision support tool. The GSA obtained satellite crop evapotranspiration (ET) data through LandIQ.**	Underway	Refinements ongoing	2023-	**0**	**0**			✓		✓	NA	Authority of a GSA under SGMA to develop and implement a GSP	$0	$10,000	DWR Grant
AE-26	Incentives for Land Conversion	The District would provide subsidies to incentivize groundwater users to convert land to alternative land uses (e.g. solar farms) and reduce groundwater extractions. The District may consider a subsidy structure study to determine which subsidies would result in the greatest expected annual benefit in acre-feet per year.	✓		✓	Land Retirement	To be implemented upon adoption of GSP	District flyers, direct mail, public meetings	None	**485 acres of solar conversion since 2015. District retained a consultant to develop Land Repurposing Program; Board to consider policy in late 2024. AEWSD provided financial incentives to landowners to conduct on-farm recharge (see AE-1).**	Underway	2025	2015 (solar conversion) & 2030 (land repurposing)	**0**	**11200**						NA	Authority of a GSA under SGMA to develop and implement a GSP	$130,000	TBD	AEWSD General Fund

AE-25	**Education of Groundwater Use per Acre**	This program would provide groundwater users an expected groundwater volume, as an education tool, prior to enforcement actions on groundwater allocations, with the goal of providing awarness of overdraft conditions. This information would be provided in an annual letter, along with average crop demand, GSA average extraction, GW overdraft, and reminders of GSA powers and authorities.	✓			Demand Reduction	To be implemented upon adoption of GSP	District flyers, direct mail, public meetings	None	**In late 2023, AEWSD published an informational flier with information on District groundwater use**	Underway	Ongoing	TBD	**0**	**100**						NA	None	$15,000	$5,000	AEWSD General Fund
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	AEWSD General Fund
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	AEWSD General Fund
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	AEWSD General Fund
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	AEWSD General Fund
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	AEWSD General Fund
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	AEWSD General Fund
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	AEWSD General Fund
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	AEWSD General Fund
KSB-9	**Subsidence Action Plan**	Subbasin wide policy to provide protocols for GSAs to investigate subsidence exceedances. This policy is developed in conjunction with the Subbasin Groundwater MT exceedence which identifies investigation and mitigation P/MA strategies.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing								✓	NA				
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
AE-27	**On-farm Water Conservation**	The NRCS is offering landowner incentive programs to assist in implementing various conservation activities, including but not limited to: irrigation system improvements, water/nutrient/pest management, and pump engine replacement. Interested landowners can call (661) 336-0967 or visit the website (www.ca.nrcs.usda.gov) for more information.	✓			Water Conservation-Efficiency	Grant funding	District flyers, direct mail, public meetings	None	**Not yet Initiated**	Upon stakeholder interest	TBD	1-3 years after initiation	**0**	**250**						NA	None	$10,000	$0	NCRS
AE-28	**Groundwater Fee Increase**	Increase GWSA costs to incentivize groundwater users to reduce groundwater extractions and take surface water when available. The District may consider modifying its fee structure study to determine the best strategy for curbing groundwater overdraft without causing inequitable economic impact.	✓		✓	Demand Reduction	As-needed to meet milestones	District flyers, direct mail, public meetings	Prop 218 or through District rate setting	**Not yet Initiated**	As-needed to meet milestones	TBD	1-3 years after implementation	**0**	**TBD**						NA	Authority of a GSA under SGMA to develop and implement a GSP	NS	NA	NA

AE-29	**Groundwater Allocation per Acre**	This program would provide a finite groundwater allocation on a per acre basis. The policy would identify and forecast the demands associated with existing water rights, domestic and environmental uses. The sustainable yield and ultimate groundwater allocation would take into consideration the applicable beneficial uses and users of groundwater. Once an individual groundwater allocation is determined, the District may adopt a policy which provides a gradual "ramp-down" wherein an allocation would decrease over time to arrive at the actual groundwater allocation to allow growers time to adjust to the concept of an allocation and, for some growers, a reduction in groundwater use. The policy would detail the number of years and amount of reduction each year.	✓		✓	Demand Reduction	To be implemented upon adoption of GSP	District flyers, direct mail, public meetings	GSA adoption of resolution; potentially CEQA	**Not yet Initiated**	As-needed to meet milestones, if other new supplies are not developed as anticipated	TBD	1-3 years after implementation	**0**	**TBD**						NA	Authority of a GSA under SGMA to develop and implement a GSP	TBD	TBD	AEWSD General Fund
AE-30	**Groundwater Marketing & Trading**	Contingent on the GW extraction quantification and allocation programs, the District would pursue a groundwater market and trading program to provide uses and beneficial users more flexibility in utilizing a groundwater allocation. The District may adopt a policy to define a groundwater trading program, acknowledging that many complexities and considerations required to successfully initiate and manage a trading program may arise. Therefore the District should discuss any other water bank/credit systems in existence. The District may adopt a groundwater trading structure and consider a variety of structures including: (1) Bilateral contracts or "coffee shop" markets; (2) Brokerage; (3) Bulletin boards; (4) Auctions and reverse auctions; (5) Electronic clearing-houses or "smart markets" ; (6) Other trade structures.	✓		✓		Contingent on "Groundwater Extraction Quantification Method" and "Groundwater Allocation per Acre" Management Actions	District flyers, direct mail, public meetings	GSA adoption of resolution; potentially CEQA	**Not yet Initiated**	As-needed to meet milestones, if other new supplies are not developed as anticipated	1-2 years after initiation by GSA Board	1-3 years after initiation	**0**	**NA**			✓			NA	Authority of a GSA under SGMA to develop and implement a GSP	TBD	TBD	AEWSD General Fund

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the currently identified “deficit” of 26,820 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

AE-7 Sunset Spreading Works - The Sunset Spreading Works is approximately 150 acres, located on the boundary between the Arvin-Edison Water Storage District (AEWSD) and Kern Delta Water District (KDWD), adjacent to KDWD's Eastside Canal. Through conversion of 150 acres of irrigated lands to the spreading works facility, approximately 410 AFY of demand reduction is occuring due to the land use change (vineyards to spreading facilities).

AE-10 Expansion of North Canal Spreading Works - Through conversion of approximately 160 acres of permanently cropped agricultural lands to additional groundwater recharge facilities as part of the District's existing North Canal Spreading Works, approximately 500 AFY in demand reduction is occuring due to the land use change (vineyards and almond orchards to spreading facilities).

AE-14 General Temporary Water Program - The Temporary Water Program consists of supplying surface water to landowners that typically rely only on groundwater. With future construction of a 40-acre regulating reservoir for the Sandrini Unit project, approximately 110 AFY of demand reduction (2.75 AF/acre) is estimated due to the land use change from previously irrigated lands.

AE-25 Education of Groundwater Use per Acre - Through this program groundwater users are provided an expected groundwater volume, as an education tool, prior to enforcement actions on groundwater allocations, with the goal of providing awareness of overdraft conditions, with an expected reduction in groundwater use/demand reduction. Given the education program is on-going and the quantification of program specific benefits cannot currently be assessed with certainty, AE-25 is not currently included in the “Glide Path”.

AE-26 Incentives for Land Conversion - This program includes providing subsidies to incentivize groundwater users to convert land to alternative land uses (e.g. solar farms) and reduce groundwater extractions. Since 2015, there have been 485 acres of solar conversion, assuming a benefit of approximately 1,200 AFY of demand reduction (2.5 AF/acre). The District may consider a subsidy structure study to determine which subsidies would result in the greatest expected annual benefit in acre-feet per year. The District has retained a consultant to undertake this study and is preliminarily estimating 10,000 AFY of demand reduction beginning in 2030 associated with this policy.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 26,820 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented that contribute to water supply augmentation include:

AE-2 On-Farm Recharge - AEWSD's Landowner Recharge Program encourages individual growers to perform on-farm recharge for individual and aggregated benefits. Water may be recharged on-farm in private basins and/or distributed through irrigation systems across irrigated acreage in excess of current crop evapotranspiration (ET). Benefits are estimated as approximately 13,250 AF of augmented recharge every 2.5 years, or 5,300 AFY.

AE-4 – Forrest Frick Pipeline / KDWD Eastside Canal Intertie - Connection of the Forrest Frick Pipeline to the KDWD Eastside Canal to send AEWSD surface water supplies through KDWD and serve portions of the AEWSD Groundwater Service Area (GWSA) with temporary water contracts, utilizing existing infrastructure (turnouts, pipelines that are both District and landowner owned), representing an estimated 1,900 AFY of surface water to be used in-lieu of groundwater pumping.

AE-6 Private & Caltrans Basin Connections = Connection of pipelines to several on-farm private basins and Caltrans sumps in AEWSD, representing a supply augmentation of approximately 270 AFY through groundwater recharge.

AE-7 Sunset Spreading Works = The Sunset Spreading Works is approximately 150 acres, located on the boundary between the Arvin-Edison Water Storage District (AEWSD) and Kern Delta Water District (KDWD), adjacent to KDWD's Eastside Canal. Through conversion of 150 acres of irrigated lands to the spreading works facility,, up to an estimated 12,300 AFY of AEWSD's surface supplies will be recharged through this project in wet years, or 4,920 AFY on average taking non-wet years into account.

AE-8 DiGiorgio Unit Temporary Water Project - The District will supply surface water when available through new facilities to the GWSA to meet its water requirements with the intent of reducing District-wide groundwater use. It is estimated that this project will result in 4,250 AFY in increased surface water deliveries to the GWSA. The DiGiorgio Unit Phase I, completed in 2018, consisted of the expansion of AEWSD's network (2.7 miles of pipelines). Phase 2a of the project consisting of approximately ½ mile of 48" pipeline is complete. The Districted has received a grant for final design on all remaining phases, however constructing the remaining phases associated with P/MA AE-8 will be initiated once funding is secured.

AE-9 Frick Unit Temporary Water Project - The District will supply surface water when available through new facilities to the GWSA to meet crop irrigation requirements with the intent of reducing District wide groundwater use. It is estimated that this project will result in 3,500 AFY in surface water deliveries to the GWSA. Construction on this project has begun and is expected to be completed by the end of 2026.

AE-10 Expansion of North Canal Spreading Works - Through conversion of approximately 160 acres of permanently cropped agricultural lands into additional groundwater recharge facilities as part of the District's existing North Canal Spreading Works, an average annual recharge benefit of 5,200 AFY (or 13,000 AF in an unconstrained year) will be attained. The 160 acre facility design is complete and District has received a $1 million state grant (Flood Diversion Recharge Enhancement) to begin construction, of which competitive bidding is due July 1, 2025. Construction will begin summer 2025 and is expected to be complete by the end of 2026.

AE-11 AEWSD South Canal Flood Study / Improvements - The South Canal Flood Study would review and possibly revise the Federal Emergency Management Agency (FEMA) floodplain in this area in order to increase the height of the canal bank to provide additional operational freeboard and accordingly reduce the potential for canal spills and subsequent flooding. Anticipated by 2030, the additional canal storage could allow for the capture and use of additional floodwater in-lieu of groundwater pumping (up to 100 to 200 AF).

AE-12 Conversion of Granite Quarry to Sycamore Ranch - The Granite Co. quarry, located upstream of the Sycamore Spreading Basins, is approaching the end of its operational life and could be converted into a balancing / detention / spreading reservoir. Excess flows in the North Canal could be pumped into the quarry reservoir, so the detained water could be recirculated for irrigation demands in-lieu of groundwater

pumping and/or recharged. It is estimated that this project would provide 3,000 to 6,000 AFY of recharge within the Tejon-Castac Water District (TCWD) GSA; benefits are therefore not included in the Arvin GSA "Glide Path".

AE-13 AEWSD Wasteway Basin Improvements - Through construction of a high-density-polyethylene (HDPE) liner along the levees, installation of recirculation pumps, and basin grading, the basin could serve as a location to divert and clarify sediment. It is estimated that approximately 1,550 AFY of stormwater capture would occur by 2040.

AE-14 General Temporary Water Program - The Temporary Water Program consists of supplying surface water to landowners that typically rely only on groundwater (GWSA). New infrastructure is being built to facilitate the implementation of this program. It is estimated that 2.75 AFY/ac will be provided to landowners dependent on groundwater. The Groundwater Service Program (GWSP), approved in February 2019 by AEWSD's board, provides for an agreement between AEWSD and groundwater service area landowners, including DiGiorgio Unit landowners, so that together they meet AEWSD's goal to increase conjunctive use planning procedures to improve overall supply reliability while minimizing total water supply costs. Under the GWSP, AEWSD can provide Power and Water Resources Pooling Authority (PWRPA) electrical service to irrigation well pumping facilities serving any landowner within AEWSD as a means to integrate the eligible landowners into the District's comprehensive surface water, groundwater, and power distribution systems.

Currently, PWRPA delivers energy to AEWSD's Forrest Frick pumping plant at transmission voltage under the WAPA-PG&E Transmission Service Agreement #59 (SA 59) and at distribution voltage at 64 other points of interconnection under the WAPA-PG&E Wholesale Distribution Tariff Service Agreement #17 (SA 17), including existing GWSP loads. AEWSD has applied to PG&E for a 230 kV transmission interconnection at PG&E's Wheeler Ridge substation to enable AEWSD to construct an electrical distribution and service (substations, power poles, power lines, transformers, etc.) system to aggregate its existing 64 distribution level loads, potential future GWSP loads and other projected District load growth (Electrical Distribution Expansion Project). If the Electrical Distribution Expansion Project is completed, the new Wheeler Ridge point of interconnection is expected to be incorporated into a Transmission Facilities Agreement (TFA) under SA 59. The Electrical Distribution Expansion Project is expected to result in lower transmission and distribution delivery charges which will lower power costs for serving AEWSD's loads, including all future GWSP loads.

AE-31 Exercising Existing Water Rights - The United States Bureau of Reclamation (USBR), San Luis Delta Mendota Water Authority (SLDMWA), Friant Water Authority (FWA), and San Joaquin River Exchange Contractors (SJREC) have entered into a memorandum of understanding (MOU) to collectively identify projects and potential actions aimed at improving drought resiliency south of the Delta, including AEWSD deliveries from the Friant-Kern Canal. The South of Delta Drought Resiliency Framework allows participating entities to voluntarily conserve and securely store a

portion of their CVP south of Delta deliveries for subsequent use with the goal of providing at least a 5% allocation to CVP south of Delta agricultural water service/repayment contracts, reducing reliance on Delta exports in drought years. An additional 5% Class 1 reliability (2,000 AFY) increase is estimated as a result of the MOU, based on two timeframes: 2010 to 2019 and 2010 to 2022.

AE-32 Capture of Imported Water Return Flows from White Wolf Subbasin - Inflows from the White Wolf Subbasin can be attributed to return flows of imported surface water deliveries by AEWSD and Wheeler Ridge Maricopa Water Storage District (WRMWSD) to landowners within the White Wolf Subbasin. The average benefit of 9,000 AFY will be split equally between AEWSD and WRMWSD (4,500 AFY).

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

AE-1 ACSD Well #12 Construction - Constructed a new well to replace a well considered at risk of contamination due to its proximity to the Brown and Bryant Superfund Site. The new well (No. 12) was drilled concurrently with the AE-5 Arsenic Mitigation Project Phase II and allows Arvin Community Services District (ACSD) to bring a total of four new wells online since July 2016.

AE-3 Emergency 1,2,3-TCP Treatment Well #12 (EPA Replacement CW-1) - Installation of emergency 1,2,3-TCP treatment at the well head, including installation of a skid mounted treatment system with two granular activated carbon media vessels for removal of 1,2,3-TCP, connection to the existing well discharge piping, installation of below ground and above ground influent and effluent piping and appurtenances, electrical and controls, and modifications to the existing well site PLC programming. Well #12 was completed and commissioned in May 2021.

AE-5 Arsenic Mitigation Project - Phase II - This project's objective is to bring the ACSD water system into compliance for Arsenic. All five of the ACSD active wells exceed the maximum contaminant level (MCL) of 10 ppb for Arsenic. The project was separated into two phases. Phase II involved drilling three new wells, constructing a 1.0-million-gallon (MG) storage tank and booster pumping plant, and connecting the facilities to the existing distribution system. The original five (5) water wells will then be abandoned and destroyed in accordance with Kern County Standards. Well #18 was completed in December 2023.

AE-24 Groundwater Extraction Quantification Method - Application of a new policy to specify an approved method to quantify the individual and aggregated groundwater extractions for the required SGMA annual reporting. Some methods to consider (or a combination of them) are the following: (1) Irrigated Acreage determined by aerial imagery; (2) Irrigated area hybrid determined by annual crop survey alongside aerial

imagery; (3) Calibrated energy records; (4) Volumetric flow measurement; (5) Remote sensing of evapotranspiration; (6) Other.

KSB-1 Friant-Kern Canal Capacity Mitigation – The Subbasin is working to implement this project shown in more detail in **Appendix G-2**. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence under the proposed implementation of the Subbasin GSPs. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results". Sustainable management criteria (SMCs) have been proposed for the FKC that limit subsidence to a 5-year annual average rate of 0.1 feet per year with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero average subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FW. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the GSPs). FWA's position is that the Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5)

develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Safe and Affordable Funding for Equity and Resilience Program (SAFER) projects, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related

to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern

Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy. See proposal document in

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile Monitoring Corridor to the California Aqueduct – The Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedance which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Section 8.5; 13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by the analysis undertaken from the five-step Action Plan SOP.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by Arvin GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Several P/MAs have been identified and listed "As Needed" on Table 3 and could further reduce the deficit if needed, as summarized below:

AE-16 Sycamore Creek Detention & Sedimentation Basin – The proposed basin would serve to intercept sediment from Sycamore creek flows to prevent constriction where sediment deposits downstream, reduce the peak outflow, and prevent the likelihood of a canal and spreading basing breach. Detained water could be recirculated for irrigation demands or recharged for a 250 AFY groundwater supply augmentation benefit.

AE-17 Stormwater Management and Flood Control Improvements – Potential construction of new sedimentation/detention basins, flood ditch erosion protection, Spillway Basin expansion, lengthening the South Canal's siphon under David Road or extension of the South Canal liner through designated floodplain reaches could result in a to be determined additional amount of supply.

AE-18 Caliente Creek Habitat Mitigation and Groundwater Recharge – Through restoration of agricultural lands to native vegetation for flood mitigation, additional benefits could be realized; however, the exact benefits of the habitat mitigation and recharge project are to be determined.

AE-19 AEWSD Intake Canal / KDWD Farmer's Canal Intertie – By improving existing and/or constructing new interties between AEWSD Intake Canal and KDWD's Farmer's Canal, water exchanges between the two districts and Kern County partners could be facilitated with an expected 4,000 AFY additional supply.

AE-20 AEWSD North Canal Balancing Reservoir Expansion & Discharge Pipelines – The proposed project will consist of the installation of a pipeline system that will convey flows from the four (4) wells within the AEWSD Balancing Reservoir directly to the basin discharge structure and no longer through the basin low flow channels. Infiltration and evaporation losses on well discharge flows will be eliminated and power efficiency for the wells (kwh/af) will be significantly enhanced since all water pumped will be discharged into the North Canal, resulting in an additional 100 AFY of new supply, and 40 AFY in demand reduction.

AE-21 AEWSD Lateral Capacity Improvement Projects – By increasing delivery capacity of the AEWSD N-55 lateral system through replacement of lateral system and landowner pipelines, renovation of storage tanks, construction of pump stations, etc., an additional 1,000 AFY could be available to AEWSD.

AE-22 AEWSD South Canal Balancing Reservoir – Through creation of a reservoir to allow water storage for flow mismatches in the AEWSD canal system during operation or emergencies, this reservoir would increase storage capacity by ~500 AF, depending on location and result in a 190 AFY reduction in demand.

AE-23 Reclamation of Oilfield Produced Water – Reclaimed water from oil production facilities could be utilized to serve irrigation demands in-lieu of groundwater pumping, for an additional 1,000 AFY of supply.

AE-24 Wastewater Reclamation with City of Arvin & Bakersfield – By utilizing treated wastewater from Cities of Arvin and Bakersfield wastewater treatment facilities for irrigation purposes, an approximate 10,000 AFY of additional supply could be available.

AE-27 On-farm Water Conservation – Through the Natural Resources Conservation Service's landowner incentive programs to assist in implementing various conservation activities, including but not limited to: irrigation system improvements, water/ nutrient/ pest management, and pump engine replacement, ~250 AFY of demand reduction could be realized.

AE-28 Groundwater Fee Increase – AEWSD could increase GWSA cost to incentivize groundwater users to reduce groundwater extractions and take surface water when available. The District may consider modifying its fee structure study to determine the best strategy for curbing groundwater overdraft without causing inequitable economic impact. Exact benefits of the groundwater fee increase are to be determined.

AE-29 Groundwater Allocation per Acre – AEWSD could provide a finite groundwater allocation on a per acre basis. The exact demand reduction for this P/MA is to be determined based on the study and policy enacted.

AE-30 Groundwater Marketing & Trading - AEWSD could pursue a groundwater market and trading program to provide uses and beneficial users more flexibility in utilizing a groundwater allocation. The groundwater trading structure could include: (1) Bilateral contracts or "coffee shop" markets; (2) Brokerage; (3) Bulletin boards; (4) Auctions and reverse auctions; (5) Electronic clearing-houses or "smart markets" ; (6) Other trade structures. Exact benefits of the groundwater market and trading program are unknown at this time.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9**, **Appendix N**, the Arvin GSA has a Pre-SGMA net water budget deficit of 27,604 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the Arvin GSA has a net water budget deficit of 40,220 AFY for 2015-2023. The P/MA combined portfolio represented herein is expected to result in benefits that will help avoid Undesirable Results by reducing demand and increasing supply within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.

- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows and corresponding response in water levels. For P/MAs that involve indirect supply augmentation through, for example, increased surface water storage capacity and delivery flexibility, quantification of the benefit will require tracking a comparison of the observed water supply condition (e.g. total imported water) against a hypothetical condition where the P/MA was not in place. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period

(i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (AE-1, AE-2, AE-6, AE-7, AE-8, AE-10, AE-11, AE-12) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. AEWSD has a contract with the USBR for 40,000 AFY of Class 1 water and 311,675 AFY of Class 2 water from the Friant Division of the CVP delivered through the Friant-Kern Canal (FKC). AEWSD also has access to water from the following associated sources: Recovered Water Account (RWA), Unreleased Restoration Flows (URF), Recapture & Recirculation (R/R), and Section 215 water.

The volume of CVP supplies is anticipated to decrease under the 2030 Climate Change Scenario relative to the Baseline Scenario, and that decrease is the main cause of the projected deficit. However, the Friant Water Authority (FWA) projections of Friant-Kern deliveries to AEWSD (FWA, 2018) assume a certain level of demand for Paragraph 16(b) wet year supplies, as described in the following excerpts:

“This analysis simulates 16(b) delivery via the Friant Kern and Madera canals with an anticipated level of future groundwater infiltration facilities throughout the Friant Division. These facilities were contemplated as a result of SJRRS implementation, and are described by analysis in the SJRRS PEIS/R.

The future management of 16(b) supplies cannot be fully anticipated at this time. Policy for the allocation of supplies has been in a constant state of evolution. For the purposes of this TM, a suggested allocation of 16(b) supplies among Friant Contractors is presented, based on the relative expected reduction in delivery of SJRRS on Class 1 and 2 contract supplies, by contractor.”

The FWA (2018) further states:

“The second SJRRS water category, Paragraph 16(b) supplies, are quantified in the CalSim II model by assuming a demand for this potential supply and meeting this demand, limited by availability of flood water and channel capacity for delivery.”

The level of demand within the Arvin GSA that is assumed in the CalSim II modeling for the FWA analysis is almost certainly less than the level of demand under the proposed P/MAs discussed herein. Therefore, with additional demand for wet year (Paragraph

16(b)) supplies created by implementation of various P/MAs within the Arvin GSA, this analysis assumes that additional Paragraph 16(b) water will be available.

In addition to the apparent underestimation of Friant Kern supplies available to AEWSD described above, the Arvin GSA will continue its efforts to refine modeling results but also continue to secure additional water supplies for importation into the Arvin-Edison Management Area through transfers, exchanges, and purchases, as necessary and possible given pricing and timing constraints.

Pursuant to transfer agreements with partner agencies, AEWSD has also obtained imported water from other sources such as the State Water Project (SWP), Westside CVP, and the Kern, Kings, Kaweah, and St. John's Rivers

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. AEWSD has received SWP water through water transfer agreements with various State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. AEWSD could purchase excess Article 21 water through transfers or exchanges with a State Water Contractor for delivery to existing project recharge facilities when such water is available.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

AEWSD currently receives Kern River water when it is available for water recharge through water service agreements with the City of Bakersfield and other water right holders. Kern River "release" or "flood" water is also available to AEWSD when water (1) is offered to all takers willing to sign a Notice/Order; or (2) is offered to the Kern River/California Aqueduct Intertie for disposal; or (3) is expected to flood farm acreage;

or (4) is expected to be delivered into the Kern River Flood Channel for disposal out-of-county. AEWSD also takes this released water from the Kern River for water recharge if and when available.

3rd Party Programs

AEWSD participates in RRBWSD's 3rd party banking program along with several Kern County and outside of Kern County agencies. Most of these programs are structured on a 2:1 basis, meaning for every acre-foot stored for the 3rd party for later drought supply, RRBWSD receives one for its banking services. These supplies come from the above three identified sources and have provided drought protection.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Water banking recharge projects have been designed assuming a wet year occurs every 2.5 years, with a maximum benefit over 100 days. Water supply augmentation benefits have been calculated as follows:

Annual Water Benefit = estimated infiltration rate ft/day * wetted acres * 100 days operation per year * 40 percent of years being wet.

P/MAs (AE-1, AE-2, AE-6, AE-7, AE-8, AE-10, AE-11, AE-12) will be met with CVP project water as discussed above or pursuant to transfer agreements with partner agencies for imported water from the SWP, Westside CVP, and the Kern, Kings, Kaweah, and St. John's Rivers.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The AEWSD is a water storage district, that possesses the legal authority to implement the P/MAs discussed herein. The AEWSD, with participation by Kern County, is also designated the Arvin GSA per California Water Code (CWC) § 10725 through 10726.8. Arvin GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to

otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- AEWSD funds, generally supported by fees charged to landowners within AEWSD, including potentially the following:
  - General fund
  - SGMA compliance subaccount (to be created)
- Partnering agencies for certain P/MAs (e.g., KDWD, TCWD, Cities of Bakersfield and Arvin, oil field producers)
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and the FEMA
- ACSD funds, generally supported by local rate payers
- Other.

Estimated costs for Arvin GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Arvin GSA	Estimated Costs	
	One-time	Annual
Implemented	$19,680,000	$105,000
Functional	$74,445,000	$37,000
In-Process	$50,000	$120,000
As-Needed	$28,310,000	$55,000
Total	**$122,485,000**	**$317,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand and groundwater pumping by land retirement (AE-26). The formation of an as-needed groundwater budget program (AE-29, AE-30) would likely include mechanisms to allow for trading or exchange of pumping allocations within designated areas, subject to constraints dictated by groundwater conditions observed within the Monitoring Network and policies developed by the respective Board of Directors. Through this combination of increased recharge during wet years and demand reduction, the Arvin GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Buena Vista GSA

Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MAs individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040. In the case of the BVGSA, which now has no deficit, the objective of the P/MA program is to avoid developing a deficit in the face of projected declines in access to surface water and increases in crop demand driven by climate change and other factors.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time,

general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

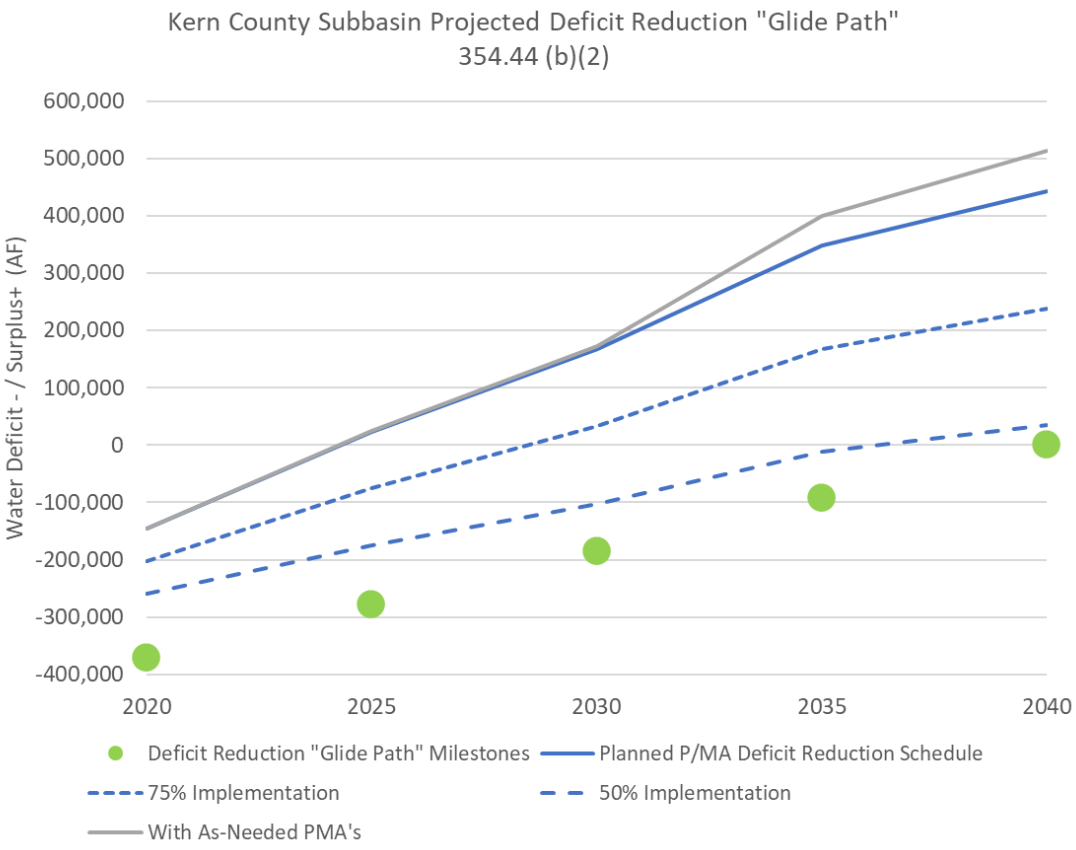


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

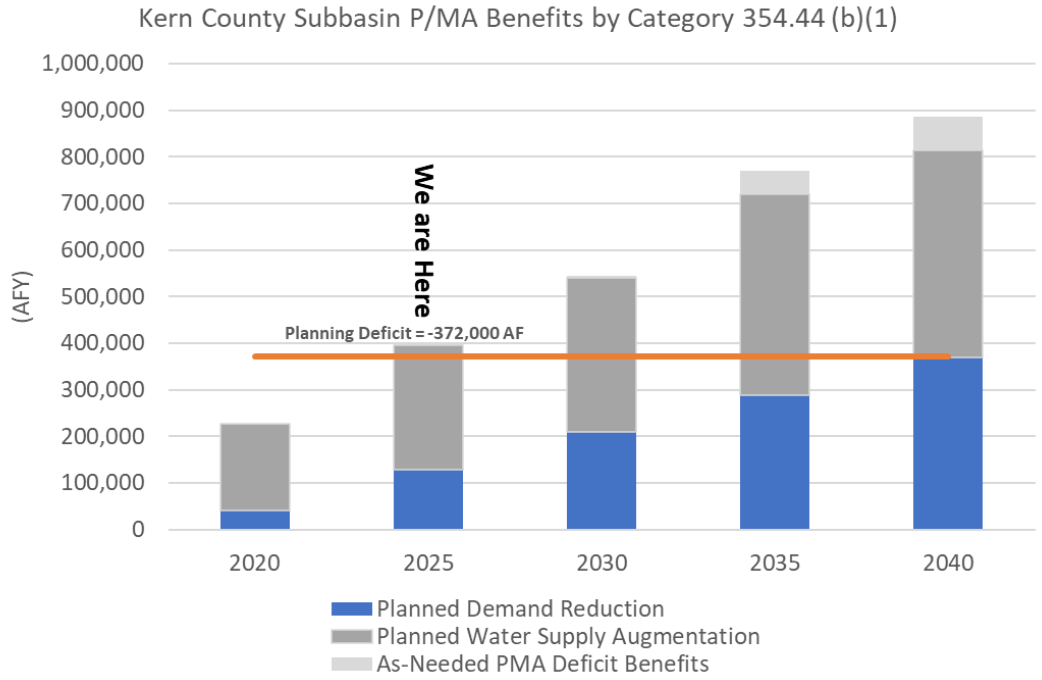


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Buena Vista Water Storage District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for BVGSA Table 2 below and illustrated on Figure 3**.** This "Glide Path" is aimed to address 25 percent (0 AFY) of the projected deficit of 0 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020. Because the BVGSA is not in deficit, the P/MA glide path can be viewed as a deficit prevention glide path intended to maintain the GSA's surplus condition.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

BVGSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	11,820	12,090	12,090	12,090	12,090
	Demand Reduction					
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**11,820**	**12,090**	**12,090**	**12,090**	**12,090**
Planned Water Supply Augmentation	Supplemental Water Recharge	9,170	9,520	27,520	27,520	27,520
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**9,170**	**9,520**	**27,520**	**27,520**	**27,520**
P/MA Implementation Schedule*		**20,990**	**21,610**	**39,610**	**39,610**	**39,610**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**20,990**	**21,610**	**39,610**	**39,610**	**39,610**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

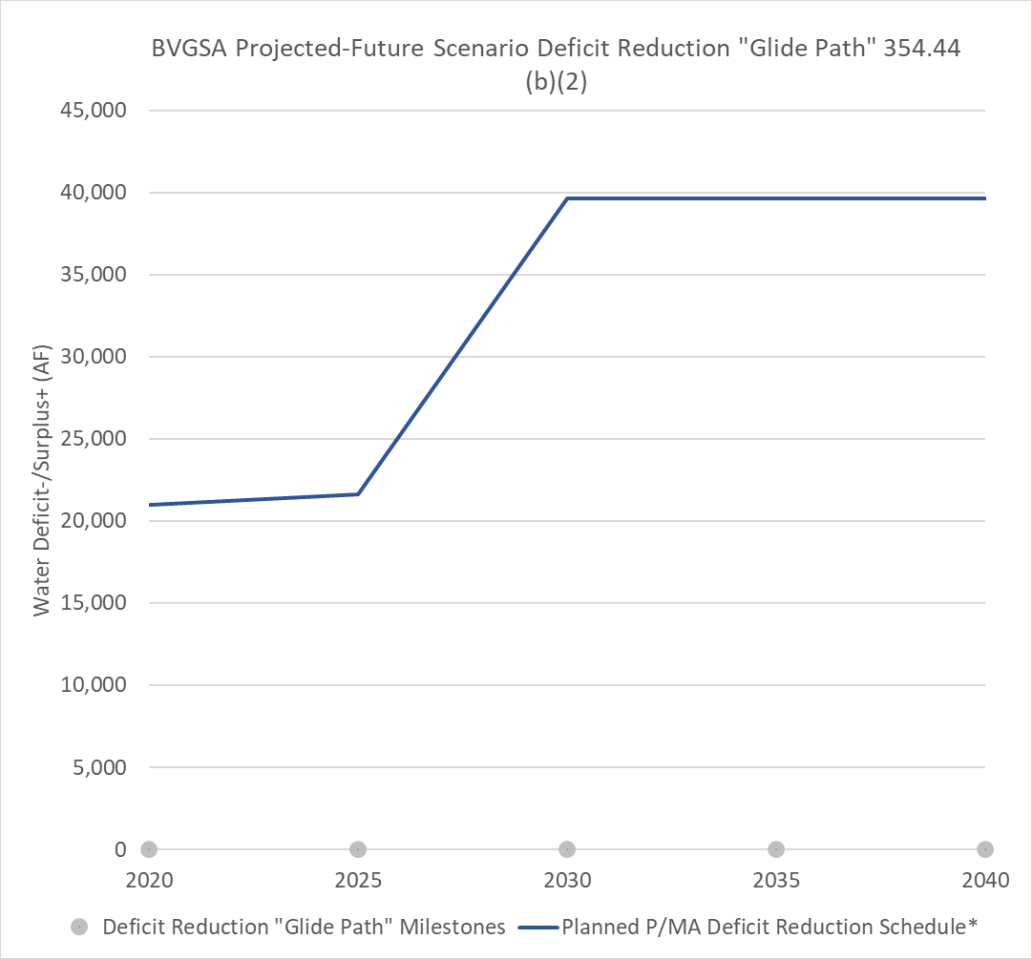


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example BV-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with "KSB-#" which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin's Sustainability Goal. All P/MAs are described in detail in the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed						
BV-1	Magnetic Flow Meter Installation	Magnetic flow meters have been installed on all production wells in BV. In addition to the approximately 200 wells now having magnetic flow meters, meters are being installed on all new and replacement wells constructed in the District.	✓		✓		Complete	NA	NA	Implemented and Operational	NA	Ongoing	2016-	0	0			✓		✓	NA	None	$800,000	$1,600	BVWSD (water charges)
BV-2	Palms Recharge Project	The BVWSD/GSA has the 1,142-acre Palms Recharge Project. This facility is located at the southern tip of the District's Buttonwillow Service Area and was constructed on lands acquired by the District and retired from agricultural production.	✓	✓	✓	Land Retirement Supplemental Water Recharge	Complete	NA	NA	Implemented and operational	NA	2019	2020-	8,700	3,340	✓	✓	✓		NA	Kern River and SWP water and occasionally Friant water	None	$26,000,000	$52,000	BVWSD (water charges)
BV-3	Corn Camp Recharge Project	In 2020 the BVWSD/GSA completed the 85-acre Corn Camp Recharge Project. This facility is located within the District and was constructed on land acquired by the District under a 20-year lease with eight 5-year options to extend the lease for a total of 60 years. The land has been retired from agricultural production.	✓	✓	✓	Land Retirement Supplemental Water Recharge	Complete	NA	NA	Implemented and operational	NA	2021	2020-	470	250	✓	✓	✓		NA	Kern River and SWP water and occasionally Friant water	None	$1,750,000	$3,500	BVWSD (water charges)
BV-4	Annexation Demand Reduction Project	The District has purchased 900 acres of white lands and taken it out of production. This land is adjacent to the District and is in the process of being annexed.	✓	✓	✓	Land Retirement	Complete	NA	NA	Implemented and operational	NA	2021	2020-	0	2,630	✓	✓	✓		NA	NA	None	$9,000,000	$18,000	BVWSD (assessment)
BV-5	Daley Ranch Recharge Project	The BVWSD/GSA purchased 91 acres that the District has used to develop the Daley Ranch Recharge Project. This facility is located within the District, and the property has been retired from agricultural production.	✓	✓	✓	Land Retirement Supplemental Water Recharge	Complete	NA	NA	Implemented and operational	NA	2022	2021-	350	270	✓	✓	✓		NA	Kern River and SWP water and occasionally Friant water	None	$4,800,000	$9,600	BVWSD (water charges)
BV-6	Completed Pipelines	Completion of 83 miles of pipeline (36" to 54") to improve distribution of irrigation water by providing an alternative to unlined canals and installing new connections to the California Aqueduct. The pipelines give the District more discretion as to when recharge is performed. The pipeline system has been designed to operated on gravity flow in non-peak irrigation months. All construction has been performed since 2014. Projects include Northern Area, Northern Area - Southern Extension, Northern Area - Eastern Extension, and 7th Standard pipelines.	✓	✓	✓		Complete	NA	NA	Implemented and Operational	NA	2022	2015-	0	0			✓		NA	Kern River and SWP water and occasionally Friant water	None	$72,000,000	$144,000	BVWSD (Capital Improvement Fund), Federal and State grants
BV-7	Completed Pump Stations	Three pump stations (two 1,200-hp and one 600-hp) have been completed to augment flow in the District's distribution system during peak months.	✓				Complete	NA	NA	Implemented and Operational	NA	2023	2020-	0	0			✓		NA	Kern River and SWP water and occasionally Friant water	None	$6,000,000	$12,000	BVWSD (Capital Improvement Fund), Federal and State grants
BV-8	Future Pump Station	Design and environmental documentation of the 600-hp Brite Rd Pump Station is in progress.	✓				Completion of Project	NA		Design/Environmental Compliance	2024	2026	2025-	0	0			✓		NA	Kern River and SWP water and occasionally Friant water	as required by CEQA	$2,450,000	$4,900	BVWSD (Capital Improvement Fund), Federal and State grants
BV-9	BV Future Pipelines	Construction of an additional 17 miles of pipeline to improve distribution of irrigation water by replacing open ditch laterals. Projects include the Belridge, Corn Camp Loop, Wasco Way, Elk Grove, and Brite Road pipelines. Important for delivering surface water to reduce reliance on marginal quality groundwater.	✓	✓	✓		Completion of Project	NA		Design/Environmental Compliance	2022	2027	2026-	0	0			✓		NA	Kern River and SWP water and occasionally Friant water	as required by CEQA	$10,000,000	$20,000	BVWSD (Capital Improvement Fund), Federal and State grants
BV-10	McAlister Ranch Recharge Project	The BVGSA/BVWSD continues to work through regulatory hurdles in the development of a 2,072-acre water bank. BVWSD owns 86% the project and the remaining 14% is on the market. The DEIR is close to completion.	✓	✓	✓	Land Retirement Supplemental Water Recharge	Completion of Project	Completion of Project	In CEQA process	Design/Environmental Compliance	2026	2028	2028-	18,000	5,600	✓	✓	✓		NA	Kern River	as required by CEQA	$35,000,000	$100,000	BVWSD (assessment)
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	Feasibility Study	NA	2030	2030-	0	0			✓	✓	✓	NA	None	Unknown	Unknown	BVWSD (assessment)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented		Functional		In-Process			As-Needed					
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.		✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	BVWSD (assessments)
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	BVWSD (assessments)
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	BVWSD (assessments)
KSB-4	Coordination with Basin Study	Coordination with local GSAs to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	BVWSD (assessments)
KSB-6	White Land Demand Management	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	BVWSD (assessments)
KSB-7	Well Registry	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	BVWSD (assessments)
KSB-8	Consumptive-Use Study	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	BVWSD (assessments)
KSB-9	California Aqueduct Subsidence Action Plan	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing														
KSB-10	RMW Data Gaps	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the currently identified “deficit” of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

BV-2 Palms Recharge Project = This facility is located at the southern tip of the District's Buttonwillow Service Area and was constructed on lands acquired by the District and retired from agricultural production. The project was constructed by removing clay overburden to create in-District recharge ponds in phases performed in 2016, 2017, 2018 and 2019. The project has now fallowed 1,142 acres of irrigated land, representing a demand reduction benefit of approximately 3,340 AFY (Net irrigated x ETiw average for 5 years).

BV-3 Corn Camp Recharge Project = In 2020 the BVGSA completed the 85-acre Corn Camp Recharge Project. This facility is located within the District and was constructed on land acquired by the District under a 20-year lease with eight 5-year options to extend the lease for a total of 60 years. The project removed irrigated land from production for conversion to recharge facilities. The project fallowed 85 acres representing a demand reduction benefit of approximately 250 AFY (Net irrigated x ETiw average for 5 years).

BV-4 Annexation Demand Reduction Project = The District has purchased 900 acres of irrigated white lands and taken it out of production. This land is adjacent to the District and is in the process of being annexed. This fallowing of annexed land represents a demand reduction benefit of approximately 2,630 AFY (Net irrigated x ETiw average for 5 years).

BV-5 Daley Ranch Recharge Project = The BVGSA purchased 91 acres of irrigated land to develop the Daley Ranch Recharge Project. This facility is located within the District, and the property has been retired from agricultural production of conversion to recharge facilities. The fallowing of 91 acres represents a demand reduction benefit of approximately 270 AFY (Net irrigated x ETiw average for 5 years).

BV-10 McAllister Ranch Recharge Project = The BVGSA continues to work through regulatory hurdles in the development of a 2,072-acre water bank. The FEIR is complete. BVWSD owns 100% of the project. The proposed project will remove 2070 acres (gross) from production. 160 acres of this has not been farmed due to Native American cultural use. Fallowing of land to construct recharge facilities represents a demand reduction benefit of approximately 5,580 AFY (Net irrigated x ETiw average for 5 years).

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 0 AFY by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented that contribute to water supply augmentation include:

BV-2 Palms Recharge Project = This facility is located at the southern tip of the District's Buttonwillow Service Area and was constructed on lands acquired by the District and retired from agricultural production. The project was constructed by removing clay overburden to create in-District recharge ponds in phases performed in 2016, 2017, 2018 and 2019. The Palms Recharge Project has been operated once since 2020 recharging 57,928 AF in 2023. Average annual recharge is projected to be 8,700 AFY (0.15 x 2023 recharge volume).

BV-3 Corn Camp Project = In 2020 the BVGSA completed the 85-acre Corn Camp Recharge Project. This facility is located within the District and was constructed on land acquired by the District under a 20-year lease with eight 5-year options to extend the lease for a total of 60 years. The project removed irrigated land from production for conversion to recharge facilities. The project has been operated once since 2020 recharging 3,144 AF in 2023. Projected average annual recharge is 470 AFY (0.15 x 2023 recharge volume).

BV-5 Daley Ranch Project = The BVGSA purchased 91 acres of irrigated land to develop the Daley Ranch Recharge Project. This facility is located within the District, and the property has been retired from agricultural production and converted to

recharge facilities. The project has been operated once since 2020 recharging 2,344 AF in 2023. Projected average annual recharge is 350 AFY (0.15 x 2023 recharge volume).

BV-10 McAllister Ranch Project = The BVGSA continues to work through regulatory hurdles in the development of a 2,072-acre water bank. The FEIR is complete. BVWSD owns 100% of the project. When fully operational the project is expected to augment supply by 18,000 AFY.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

BV-1 Magnetic Flow Meter Installation - Magnetic flow meters have been installed on all production wells in BVGSA. In addition to the approximately 200 wells now having magnetic flow meters, meters are being installed on all new and replacement wells constructed in the District. BVGSA uses monthly meter readings on all wells in the BVWSD to compare and verify actual groundwater pumping. This allows for better understanding of the quantity of water returned to the groundwater Subbasin beyond the root zone.

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that “any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results.” Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per

second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program (ILRP), Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help

Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry - In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study The Kern Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Kern Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Kern Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions.

The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by BVGSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts. No projects and management actions have been identified and listed under the category of “As Needed”, however the BVGSA’s implementation of KSB 3 and KSB 5 can be adaptively managed to respond to exceedances of Minimum Thresholds, if needed.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the BVGSA has a Pre-SGMA net positive water budget of 20,937 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the BVGSA has increased its net positive budget by approximately 18,000 AFY over the historical period in part due to the implementation of several early P/MAs. These efforts increased the annual positive water budget to 39,494 AFY for 2015-2023. The P/MA portfolio represented herein is expected to continue the net positive annual water budget throughout the post-SGMA period and avoid Undesirable Results within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND), and Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2. Since BVGSA is already sustainable there is no timetable of implementation for P/MA's.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., reduction of irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place and water consumption of the land uses present in the absence of the P/MA was estimated. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (BV-2, BV-3, BV-5, BV-10) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the Friant-Kern Canal through the CVC. The Friant-Kern Canal capacity has been recently hampered by subsidence which has limited available supplies. Remediation efforts are underway and should restore access to these critical supplies by 2030.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. BVWSD currently receives SWP water through a water supply contract (Table 1 Entitlement 21,300 AF) with Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. BVWSD purchases excess Article 21 water through its State Water Contractor for delivery to existing project recharge facilities using the CVC when such water is available.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

BVWSD currently receives Kern River water under its pre-1914 water rights which it has administered since the formation of the District. At the time of formation, as the successor to the Second Point interests under the Miller-Haggin Agreement, BVWSD became entitled to provide for the distribution of the Second Point water rights that were tied to the Company's lands

3rd Party Programs

BVWSD partners with RRBWSD for a third-party banking project with Castaic, now known as Santa Clarita Valley Water Agency (SCVWA). For each year BVWSD banks 9,706 AF in RRBWSD, often in large amounts in very wet years. In turn, RRBWSD supplies 8,250 AF annually to SCVWA and benefits from a 15 percent leave behind. BVWSD also supplies 2,750 AF of surface water to SCVWA annually. This contract runs through December 31, 2036. BVWSD is required to supply 12,9706 AF for the years 2025-2036, or 116,472 AF. BVWSD has supplied all but 12,000 AF of the water required through 2036. This equates to an annual requirement for fulfillment of 1,000 AF/year in addition to the 2,750 AF of surface water supplied annually. This additional requirement of water, 3,750 AF annually through 2036, is significantly less than BVWSD's annual surplus.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Water recharge projects have been designed with a conservative water supply augmentation benefit calculation. Water supply augmentation benefits have been calculated as follows:

Annual Water Benefit for Existing Facilities = wet year recharge measured in 2023 x 0.15 to adjust for the expected frequency of wet year flows.

This conservative planning method estimates that the total recharge facility opportunity time would be 8 percent of the time. This is less than half of the long-term (2001-2020) estimate of recharge opportunities occurring in 20 percent of years.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The BVWSD is a water storage district, that possesses the legal authority to implement P/MAs discussed herein. BVGSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on

the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time. As of this writing, the BVWSD has accrued no indebtedness for implementation of P/MAs.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR, and United States Bureau of Reclamation (USBR).

Estimated costs for BVGSA P/MAs by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Buena Vista GSA	Estimated Costs	
	One-time	Annual
Implemented	$120,350,000	$335,700
Functional		
In-Process	$47,475,000	$184,900
As-Needed		
Total	**$167,825,000**	**$520,600**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As stated previously in **Section 9 *Water Budget Information***, under historical conditions (WY 2010 – 2019) the BVGSA is in a state of water supply/demand surplus based on the "checkbook" water budget planning tool and on water budgets developed by the District and presented in previously submitted GSPs. Under the projected Baseline and 2030 (and 2070) Climate Change Scenarios, the net water supply surplus is projected to continue within the GSA. One primary means by which the current surplus will be maintained is through implementing P/MAs that augment supplies from additional outside sources of water, particularly during normal to wet years. Therefore, the representations of the glide path for the BVGSA represent the schedule for P/MA implementation and accrual of water supply demand reduction benefits, but do not imply that these P/MAs are needed to correct an overdraft. Many of the projects discussed herein are designed to

improve retention and management of wet-year supplies available during periods of high flows in the Kern River and high deliveries from the SWP and CVP. These P/MAs include various direct recharge projects and projects that increase storage capacity and recovery and distribution flexibility.

In addition to these supply augmentation projects, the portfolio also includes policy-based management actions aimed at possible minor demand reduction. These management actions aim to reduce water demand through land retirement. Through this combination of increased recharge and demand reduction, the GSA's P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods to enable the BVGSA to maintain its historic condition of having water supplies surplus to demands.

Cawelo Water District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage "deficit" of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document~~s~~, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA~~s~~. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

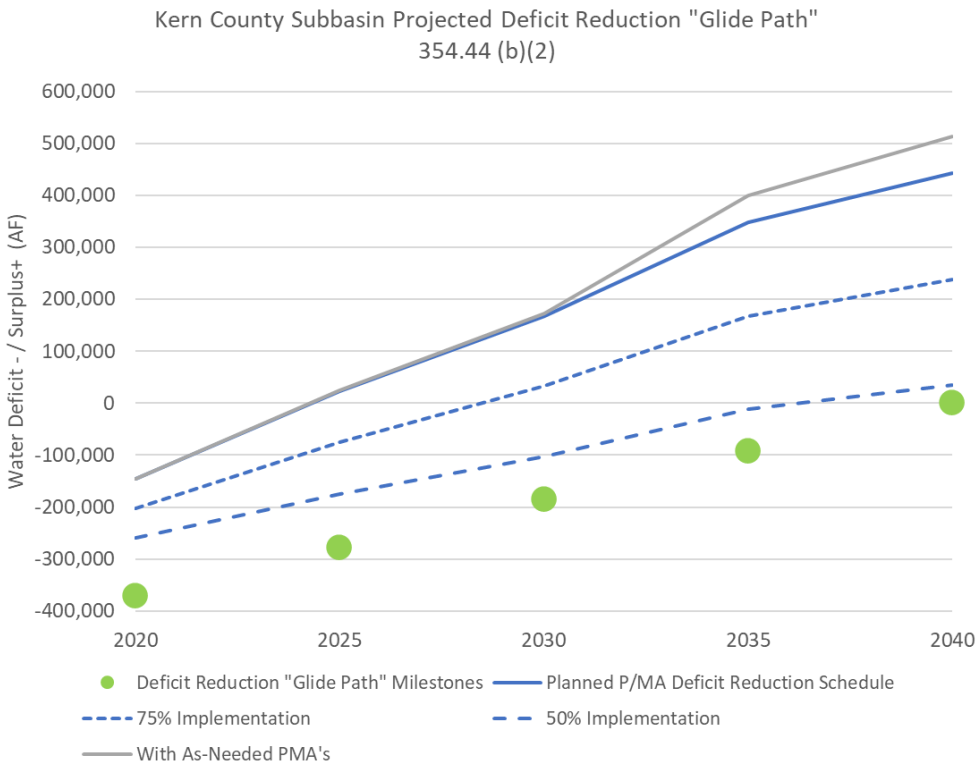


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

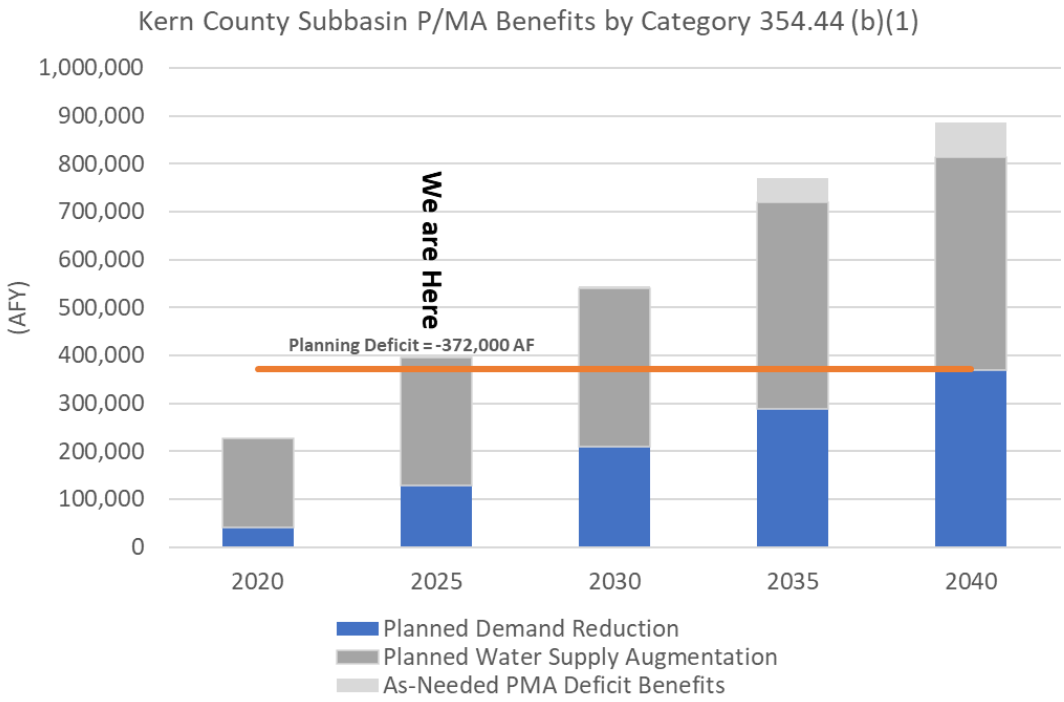


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Cawelo Water District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Cawelo Water District GSA (CWD GSA) in Table 2 below and illustrated on Figure 3. The "Glide Path" is aimed to address 25 percent (132 AF) of the projected deficit (530 AF) of during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to have exceeded the target deficit reduction as early as 2025. Please note that the last row of Table 2 eventually shows an increasing volume of surplus water resulting from CWD GSA P/MA implementation.

Post 2025 P/MA demand reduction and supply augmentation will provide additional resilience in the event of drier conditions or other unforeseen changes to the CWD GSA's water balance.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Cawelo Water District GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-530			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-133**	**-265**	**-398**	**-530**
Deficit Reduction "Glide Path" Milestones		**-530**	**-398**	**-265**	**-133**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement				2,000	4,000
	Demand Reduction		2,300	2,300	6,200	14,700
	Ag to Urban Conversion	0	375	750	1,125	1,500
	Water Conservation-Efficiency	3,800	3,800	3,800	3,800	3,800
	Subtotal	**3,800**	**6,475**	**6,850**	**13,125**	**24,000**
Planned Water Supply Augmentation	Supplemental Water Recharge		2,560	2,560	2,560	2,560
	Supplemental Water Use	5,800	5,800	5,800	5,800	5,800
	Third-Party Banking		500	500	500	1,750
	New Local Supply		8,000	12,000	16,000	20,000
	Exercise of Rights			150	150	150
	Subtotal	**5,800**	**16,860**	**21,010**	**25,010**	**30,260**
P/MA Implementation Schedule*		**9,600**	**23,335**	**27,860**	**38,135**	**54,260**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**9,070**	**23,335**	**27,860**	**38,135**	**54,260**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

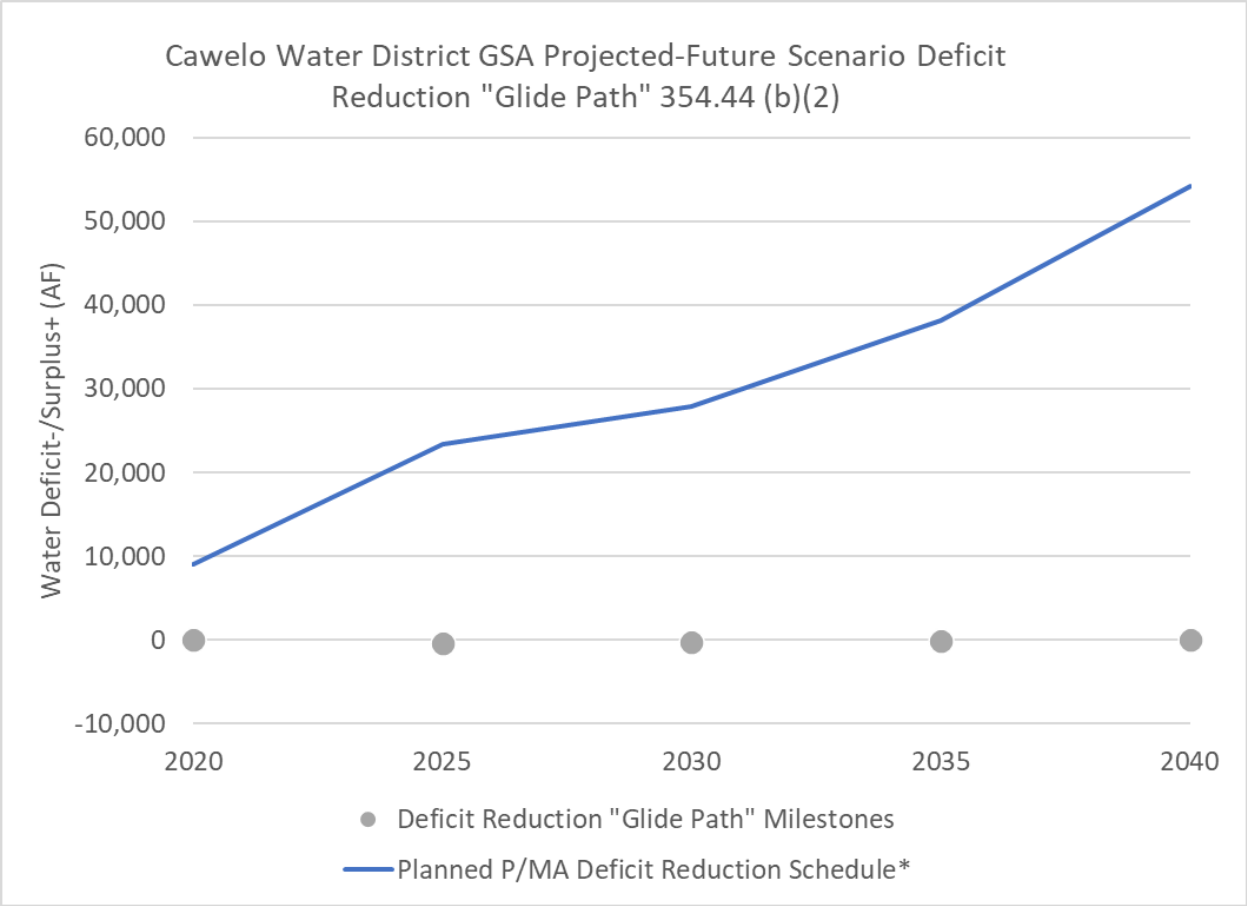


Figure 3. P/MA-5 (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example RRB-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA PMA's)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process				As-Needed				
CWD-1	New Water Supply Purchases	Implement programs that will acquire long-term new water contracts and/or establish a water purchase fund. The main goal would be to secure long-term water contracts and/or build a reserve fund for water purchases when supplemental water is available.	✓	✓	✓	Supplemental Water Supply	Complete	NA	NA	**Implemented**	Complete	Complete	2020-	**5800**	**0**	✓	✓	✓			State Water Project, Kern River, Central Valley Project	None		$8,000,000	Cawelo Water District (Assessments / Water Charges)
CWD-3	Increase Recharge Capacity	Implement programs and/or projects to increase water recharge capacity to capture and recharge additional wet year high flow waters to store for future use. CGSA will also consider to implement a program to incentivize landowners to use their land for recharge.	✓	✓	✓	Supplemental Water Recharge Land Retirement Demand Reduction	In-Process Implemented	Board Meetings Public Notice and Outreach	CEQA Construction Permits	**In-Process (CWD increase water recharge capacity) Implemented (Landowner Banking Program)**	Current	2025	2025-	**400**	**300**	✓	✓	✓			State Water Project, Kern River, Central Valley Project	None	$9,000,000		Cawelo Water District (Assessments) CGSA Landowners
CWD-2	Friant Pipeline Project	Construct a pipeline, pump station, and turn-in/out structure to connect the CWD Famoso Recharge Basins directly to the Friant-Kern Canal. This project will allow for greater access to supplemental water and support additional banking programs.	✓	✓	✓	Supplemental Water Supply Supplemental Water Recharge Third-Party Banking	In-Process	Board Meetings Public Notice and Outreach	CEQA Construction Permits	**Construction**	Current	2024	2025-	**2160**	**0**	✓	✓	✓			Central Valley Project Third-Party Banking Partner	None	$9,000,000		Cawelo Water District (Assessments)
CWD-4	New Cawelo GSA Banking Partners	Modify existing CWD banking programs to increase the amount of water banked or initiate new banking programs and partners as a secondary priority.	✓	✓	✓	Third-Party Banking	In-Process	Board Meetings Public Notice and Outreach	CEQA Construction Permits	**In-Process**	Current	2030	2025-	**500**	**0**	✓	✓	✓			Third-Party Banking Partner	None		$100,000	Third-Party Banking Partner Cawelo Water District (Assessments)
CWD-5	Poso Creek Flood Water Capture	Construct additional facilities to utilize existing appropriative rights to divert supplementary water from high flows from Poso Creek.	✓	✓	✓	Exercise of Rights	In-Process	Board Meetings Public Notice and Outreach	CEQA Construction Permits	**Conceptual**	Current	2030	2030-	**150**	**0**	✓	✓	✓			Poso Creek	None	$3,900,000		Cawelo Water District (Assessments / Water Charges)
CWD-6	Water Treatment Facilities	Construct additional potential water treatment facilities/operations to acquire additional treated oilfield produced water that is safe for crop irrigation. When irrigation demands are low the water will be recharged for later use.	✓	✓	✓	New Local Supply	In-Process	Board Meetings Public Notice and Outreach	CEQA CVRWQCB WDR Construction Permits	**In-Process**	Current	2035	2025-	**20000**	**0**	✓		✓			Treated Oilfield Produced Water 9000 AF in 2025 to 20000 in 2040	None	$11,250,000		Cawelo Water District (Assessments / Water Charges)
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-					✓	✓	✓	NA	None	Unknown	Unknown	Cawelo Water District (Assessments)
CWD-7	Surface Water Storage	Construct a 5,000 AF reservoir to provide additional storage capacity during wet years to increase ability to capture available supplemental water during wet hydrological conditions.	✓	✓	✓	Supplemental Water Supply	As Needed	Board Meetings Public Notice and Outreach	CEQA Construction Permits	**As Needed**	As Needed	2035	2035-	**500**	**0**		✓	✓			State Water Project, Kern River, Central Valley Project	None	$40,000,000		Cawelo Water District (Assessments)
CWD-8	Out of Cawelo GSA Banking	Evaluate additional groundwater banking projects outside the Cawelo GSA, both within and outside the Kern County Subbasin.	✓	✓	✓	Supplemental Water Supply Third-Party Banking	As Needed	Board Meetings Public Notice and Outreach	NA	**As Needed**	NA	2035	2030-	**1250**	**0**	✓	✓	✓			State Water Project, Kern River, Central Valley Project	None		$500,000	Cawelo Water District (Assessments / Water Charges)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional	In-Process					As-Needed					
CWD-9	**Voluntary Land Conversion**	Develop a program to incentivize landowners to reduce their total crop demand by converting farmed land to groundwater recharge areas.	✓	✓	✓	Demand Reduction	Complete	Board Meetings Public Notice and Outreach	CEQA	**Implemented**	Complete	Complete	2025-	**0**	**2,000**			✓	✓		Demand Reduction	None	$8,750,000	$0	Cawelo Water District (Assessments) CGSA Landowners
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	Cawelo Water District (Assessments)
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	Cawelo Water District (Assessments)
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	Cawelo Water District (Assessments) CGSA Landowners
CWD-11	**Crop Conversion and Irrigation Efficiency**	Incentive programs for growers to convert to crops that require less water and to improve irrigation practices.	✓	✓	✓	Demand Reduction Water Use Efficiency	Implemented	Board Meetings Public Notice and Outreach	NA	**Implemented**	2020	2040	2020-	**0**	**3,800**			✓	✓		Demand Reduction Water Use Efficiency	None	$0	$5,000	Cawelo Water District (Assessments) CGSA Landowners
CWD-12	**Agriculture to Urban Land Use Conversion**	Conversion of agricultural land use to urban/commercial land use due to urban expansion.	✓	✓	✓	Demand Reduction Land Retirement	Implemented	NA	NA	**Implemented**	2020	2040	2025-	**1,500**	**1,500**			✓			Demand Reduction Land Retirement	None	$0	$0	NA
CWD-13	**Short-Term Land Fallowing**	Refunds the District Assessments for enrolled lands and provides additional monetary compensation in the subsequent years to incentivize extended redevelopment timeline(s). Service Area enrolled land(s) are required to relinquish the respective District allocated water to the District and may request the District to permanently purchase the District allocated water and fallow the land permanently.	✓		✓	Demand Reduction	Complete	Board Meetings Public Notice and Outreach	NA	**Implemented**	As Needed	2025	2025-		**14,700**			✓			Demand Reduction	None		$5,600,000	Cawelo Water District (Assessments / Water Charges)
CWD-14	**Long-Term Land Fallowing**	Developed and irrigated land(s) within the last five (5) years would be purchased and immediately fallowed by the District. Land(s) purchased by the District under the Long-Term Program are not eligible for future irrigated agricultural development. Up to 890 acres may be fallowed under this PMA.	✓		✓	Demand Reduction	Complete	Board Meetings Public Notice and Outreach	NA	**Implemented**	As Needed	2025	2025-		**2,000**			✓			Demand Reduction	None	$22,250,000		Cawelo Water District (Assessments / Water Charges)

CWD-10	**Secure Access to Additional Monitoring Location**	Pursue an access agreement for a monitoring well location in the southeastern portion of the GSA.	✓	✓	✓	Not Applicable (monitoring)	In-Process	NA	NA	**In-Process**	2020	2025	2025-	**0**	**0**					✓	NA	None	$0	$0	NA
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	Cawelo Water District (Assessments)
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	Cawelo Water District (Assessments) CGSA Landowners
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	Cawelo Water District (Assessments) CGSA Landowners
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	Cawelo Water District (Assessments) CGSA Landowners
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs that have either been implemented or are currently being implemented or in-process and contribute to water demand reduction include:

CWD-3 Increase Recharge Capacity = Implement programs and/or projects to increase water recharge capacity to capture and recharge additional wet year high flow waters to store for future use. CWD GSA will also consider implementing a program to incentivize landowners to use their land for recharge.

CWD-9 Voluntary Land Conversion = Develop a program to incentivize landowners to reduce their total crop demand by converting farmed land to groundwater recharge areas.

CWD-11 Crop Conversion and Irrigation Efficiency = Incentive programs for growers to convert to crops that require less water and to improve irrigation practices.

CWD-12 Agriculture to Urban Land Use Conversion = Conversion of agricultural land use to urban/commercial land use due to urban expansion.

CWD-13 Short-Term Land Fallowing = Refunds the District Assessments for enrolled lands and provides additional monetary compensation in the subsequent years to incentivize extended redevelopment timeline(s). Service Area enrolled land(s) are required to relinquish the respective District allocated water to the District and may request the District to permanently purchase the District allocated water and fallow the land permanently. Up to 6,679 acres may increase their redevelopment timeline and reduce water use under this PMA.

CWD-14 Long-Term Land Fallowing = Developed and irrigated land(s) within the last five (5) years would be purchased and immediately fallowed by the District. Land(s) purchased by the District under the Long-Term Program are not eligible for future irrigated agricultural development. Up to 890 acres may be fallowed under this PMA.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain

currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of Implementation of a "Glide Path" that will result in closing the current identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs that have either been implemented or are currently being implemented or in-process and contribute to water supply augmentation include:

CWD-1 New Water Supply Purchases = Implement programs that will acquire long-term new water contracts and/or establish a water purchase fund. The main goal would be to secure long-term water contracts and/or build a reserve fund for water purchases when supplemental water is available.

CWD-2 Friant Pipeline Project = Construct a pipeline, pump station, and turn-in/out structure to connect the CWD Famoso Recharge Basins directly to the Friant-Kern Canal. This project will allow for greater access to supplemental water and support additional banking programs.

CWD-3 Increase Recharge Capacity = Implement programs and/or projects to increase water recharge capacity to capture and recharge additional wet year high flow waters to store for future use. CGSA will also consider to implement a program to incentivize landowners to use their land for recharge.

CWD-4 New Cawelo GSA Banking Partners = Modify existing CWD banking programs to increase the amount of water banked or initiate new banking programs and partners as a secondary priority.

CWD-5 Poso Creek Flood Water Capture = Construct additional facilities to utilize existing appropriative rights to divert supplementary water from high flows from Poso Creek.

CWD-6 Water Treatment Facilities = Construct additional potential water treatment facilities/operations to acquire additional treated oilfield recycled produced water (RPW) that is safe for crop irrigation. When irrigation demands are low the water will be recharged for later use.

CWD-7 Surface Water Storage = Construct a 5,000 AF reservoir to provide additional storage capacity during wet years to increase ability to capture available supplemental water during wet hydrological conditions.

CWD-8 Out of Cawelo GSA Banking = Evaluate additional groundwater banking projects outside the Cawelo GSA, both within and outside the Kern County Subbasin.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

CWD-10 Secure Access to Additional Monitoring Location = Pursue an access agreement for a representative monitoring well location in the southeastern portion of CWD GSA.

KSB-1 Friant-Kern Canal Capacity Mitigation - The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and

mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.

c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program - The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern

Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-6 White Land Demand Management – The Subbasin, as part of the 2024 GSP amendment process, developed a more accurate well inventory based on available databases and field verifications. This management action will continue to provide improvements and maintenance of the Subbasin's existing well inventory and house the well registry within the Kern County Subbasin data management system. At least annually, the Subbasin will update the system using DWR/County well permit information and well surveys. Additional details regarding the data sources and methodologies used to develop the improved well inventory can be found in Section 14.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Kern Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Kern Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Kern Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by CWD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in Section 9, Appendix N, the CWD GSA has a Pre-SGMA net water budget deficit of 530 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties that was banked but not returned during the period, includes supplies created by third-party banking projects during this period (e.g., 2:1 banking operations), and includes groundwater transfers to/from other, adjacent GSA's areas.

For the Post-SGMA period between 2015-2023 [which includes five years of drought (2015-2016 and 2020-2022)], the CWD GSA has a net water budget deficit of 3,859 AF. It is important to note, that during the time period of 2015 to 2023 the average irrigated acreage in the CWD GSA decreased approximately 1,200 acres compared to the 1995 to 2014 period average. This, along with other water-use efficiency practices, resulted in a reduced applied water demand of approximately 11,300 AFY on average in the CWD GSA. The irrigated acreage decrease and corresponding demand reduction is not included in any future CWD GSA P/MA anticipated benefits (i.e., P/MA projected benefits are over and beyond the demand reduction already occurring within the CWD GSA).

Furthermore, in 2025 CWD GSA is planning 6,475 AFY of demand reduction P/MAs implemented and incurring benefits (Table 2). The 6,475 AFY of planned demand reduction P/MAs provides approximately a 12:1 factor of safety compared to the 1995-2014 historical base period and approximately 2:1 factor of safety compared to the 2015-2023 Post-SGMA period. The planned demand reduction of 6,475 AFY to be implemented in 2025 also addresses both the Pre-SGMA (1995-2014) and Post-SGMA (2015-2023) CWD GSA deficit allowing the CWD GSA to operate sustainably beginning in 2025.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.

- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 1. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit will be quantified directly through flow measurement. For P/MAs that involve indirect supply augmentation through increased groundwater storage or banking, quantification of the benefit will require tracking of project water deliveries and estimates of indirect supply increases based on specific project conditions. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against the recent historical and projected condition without the P/MA in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (CWD-1, CWD-2, CWD-3, CWD-4, CWD-5, CWD-6, and KSB-1) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the Friant-Kern Canal through various Cawelo owned or jointly owned facilities. Cawelo can obtain CVP Section 215 flood water supplies through an annual contract with USBR, when available. The Friant-Kern Canal capacity has been recently hampered by subsidence which has limited available supplies. Remediation efforts are underway and should restore access to these critical supplies by 2030.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. Cawelo currently receives SWP water through a water supply contract (Table 1 Entitlement 38,200 AF) with Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. Cawelo purchases excess Article 21 water through the KCWA for delivery to existing project recharge facilities using the CVC when such water is available.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River and Poso Creek water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion. In 2000, Cawelo was issued a permit to divert water from Poso Creek for beneficial use at a rate of approximately 110 cfs with the volume limited to 30TAF between November 1 and June 14. An agreement between Cawelo, North Kern Water Storage District, and Semitropic Water Storage District allocated the first 135 cfs of Poso Creek flow to Cawelo.

Cawelo currently receives Kern River water when it is available for irrigation demands and groundwater recharge through water service agreements with the City of Bakersfield, the Kern County Water Agency, and other water right holders. Kern River “release” or “flood” water is also available to Cawelo when water (1) is offered to all takers willing to sign a Notice/Order; or (2) is offered to the Kern River/California Aqueduct Intertie for disposal; or (3) is expected to flood farm acreage; or (4) is expected to be delivered into the Kern River Flood Channel for disposal out-of-county. Cawelo also takes this released water from the Kern River for groundwater recharge if and when available.

3rd Party Programs

Cawelo has long operated as 3rd party banking program for an outside of Kern County agency. Over the past several years more interest has been expressed in participating in Cawelo banking programs for drought protection needs. Cawelo's banking programs operate at 2:1 (i.e., for every 2 AF of water delivered to Cawelo, the banking partner receives credit for 1 AF). The excess 1 AF of water is credited to Cawelo for future recovery and use. These supplies come from the above three identified sources and have provided groundwater supply for Cawelo and drought protection for the 3rd party.

Treated Oilfield Recycled Produced Water

Cawelo has active partnerships with oil producers who produce water as part of the oil extraction process. This water is treated for non-potable uses including agricultural and other irrigation uses.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The CWD is a water district, that possesses the legal authority to implement P/MAs discussed herein. CWD, with participation by Kern County, is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- CWD assessments and/or water charges.
- CWD landowner financial sponsorship.
- Financial sponsorship from third party banking partners.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for CWD GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Cawelo Water District GSA	Estimated Costs	
	One-time	Annual
Implemented	$8,750,000	$8,100,000
Functional	$31,250,000	$5,600,000
In-Process	$24,175,000	$160,000
As-Needed	$40,000,000	$500,000
Total	**$104,175,000**	**$14,360,000**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, one primary means by which future potential deficits and total Subbasin deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Eastside Water Management Area
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3. times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

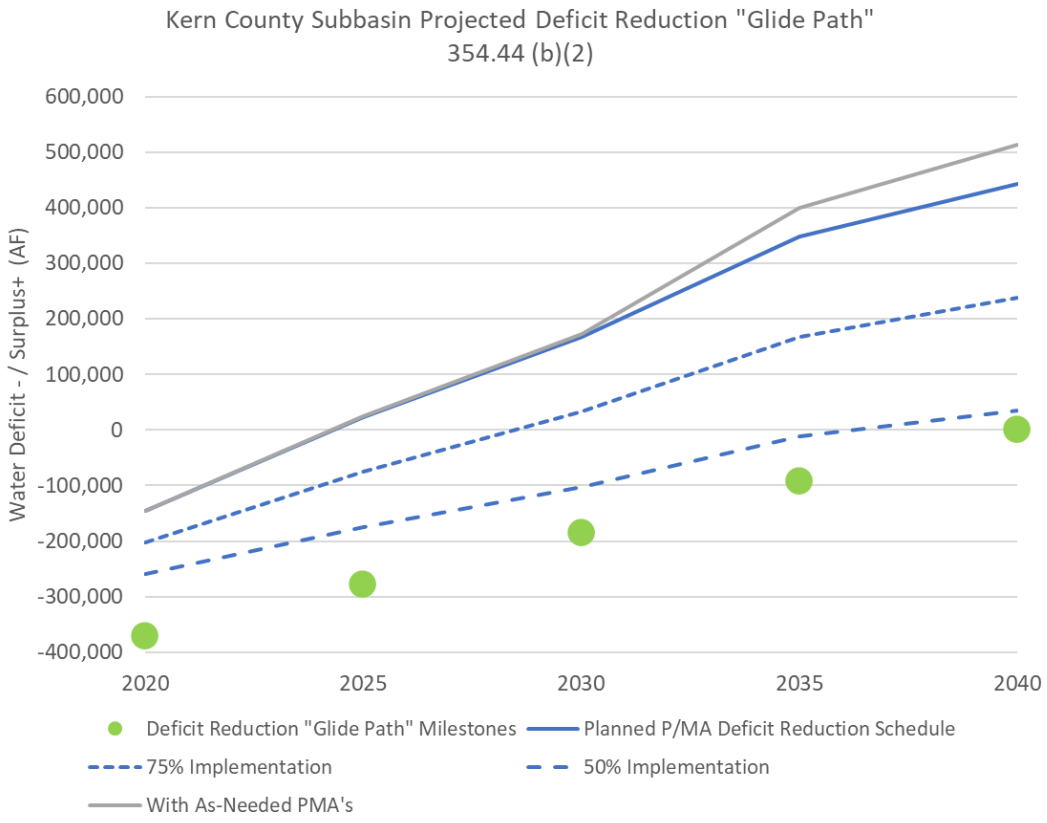


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

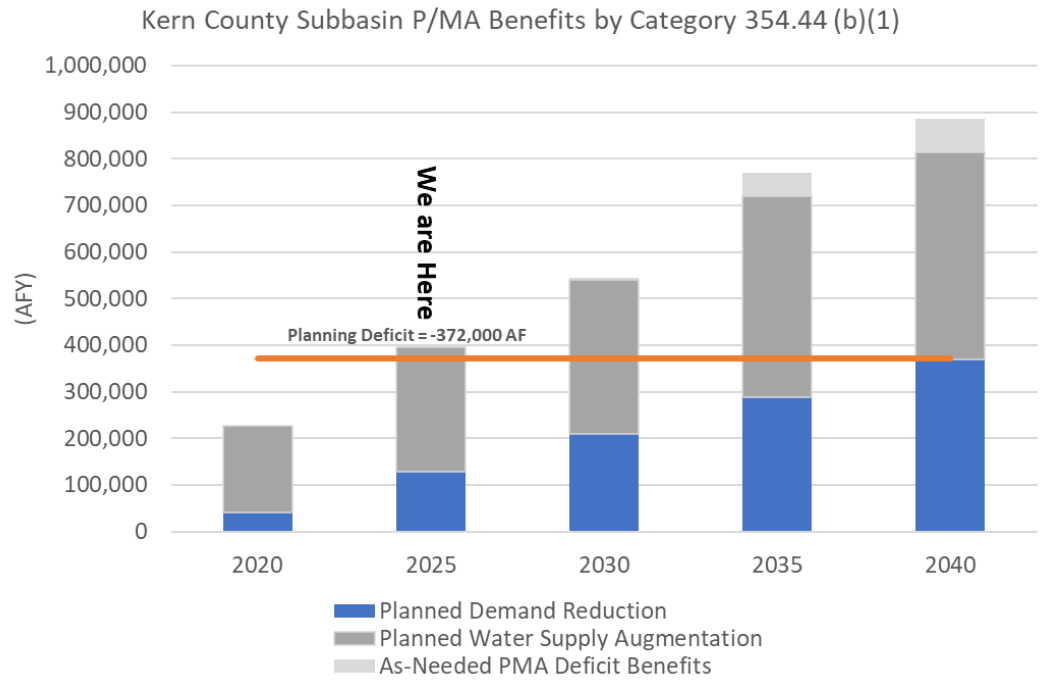


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Eastside Water Management Area

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for EWMA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (833 AFY) of the projected deficit of 3,330 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2028.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Eastside Water Management Area GSA Projected-Future Scenerio Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-3,330			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-833**	**-1,665**	**-2,498**	**-3,330**
Deficit Reduction "Glide Path" Milestones		**-3,330**	**-2,498**	**-1,665**	**-833**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction			2,900	2,900	2,900
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**0**	**2,900**	**2,900**	**2,900**
Planned Water Supply Augmentation	Supplemental Water Recharge				3,220	3,220
	Supplemental Water Use				900	900
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**0**	**0**	**0**	**4,120**	**4,120**
P/MA Implementation Schedule*		**0**	**0**	**2,900**	**7,020**	**7,020**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**-3,330**	**-3,330**	**-430**	**3,690**	**3,690**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

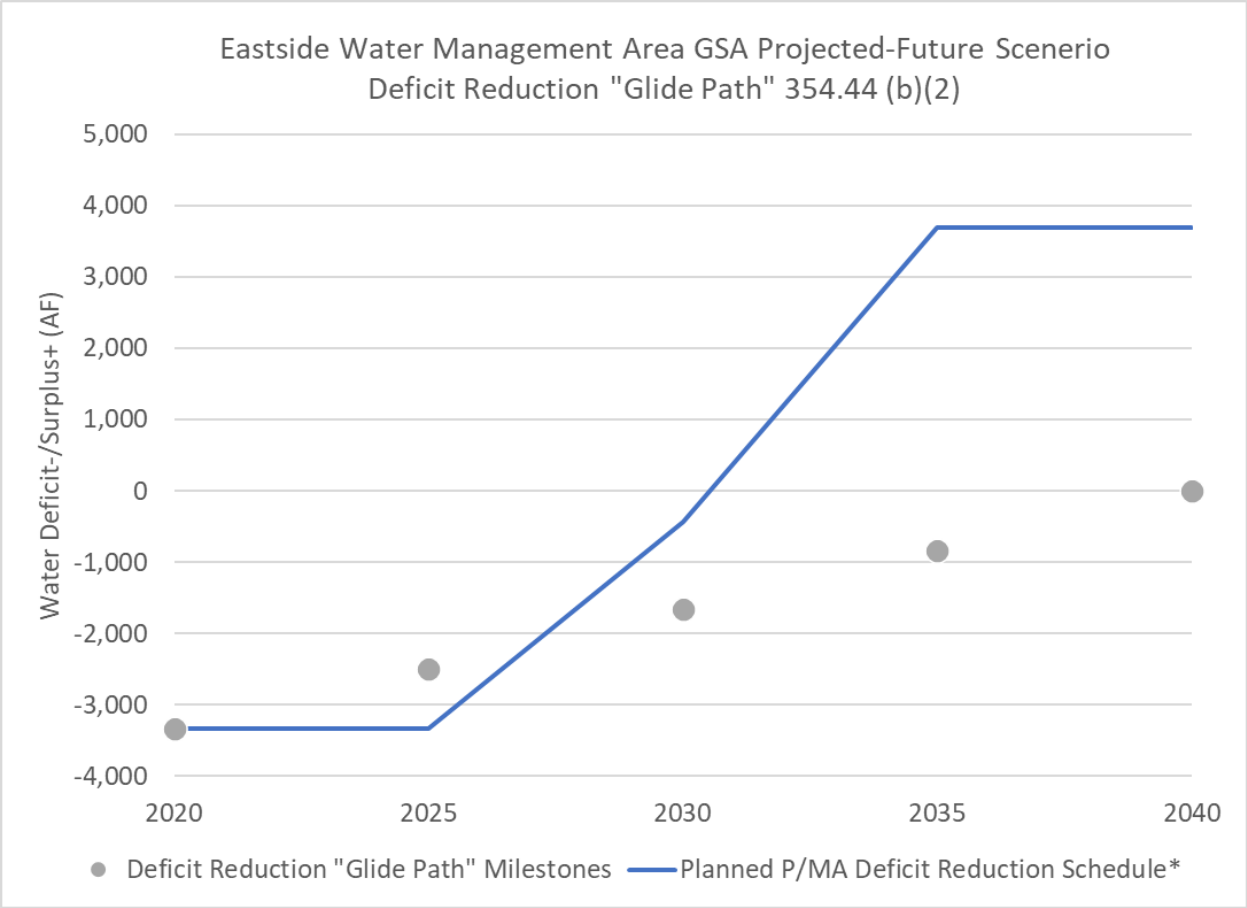


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example EWMA-1) if the P/MA is specific to the individual GSA. P/MAs are numbered with “KSB-#” if the P/MA is considered to be Subbasin wide in nature. Note that “KSB” P/MAs have either full Subbasin participation or nearly all GSAs participating. All projects and management actions are described in detail on the tables below.

Table 3. EWMA P/MAs

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented		Functional	In-Process				As-Needed					
EWMA-1	**Produced Water Supply Project**	Development of oilfield produced-water supplies to potentially reduce groundwater demand	✓			Supplemental Water Source	Completion of Design	Stakeholder Meetings, Board Meetings	WDR	**Initiating Development**	Currently functional at pilot level	2035	2035-	**900**	**0**			✓			Oil & gas operations produced water	Possibly RWQCB WDR depending on WQ	$2,950,000	$50,000	EWMA landowners, future grants, potential Prop 218
EMWA-2	**Surface Runoff Capture Project**	Surface runoff capture and enhanced infiltration in impoundments	✓			Supplemental Water Recharge	Completion of favorable feasibility study; successful permitting application, completion of design	Stakeholder Meetings, Board Meetings	Legal review; SWRCB approval of diversion; CDFW approval of streambed alterations, others	**Planning**	Favorable legal and hydrologic feasibility analysis	2035	2035-	**3220**	**0**		✓	✓			Surface water runoff	Multiple Agencies	$800,000	$100,000	Future grants, potential Prop 218
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasiblity Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	EWMA assessments

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented		Functional	In-Process				As-Needed					
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	EWMA assessments
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	EWMA assessments
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	SGMA Implementation Grant, EWMA Assessments

EWMA-3	**Groundwater Quality Investigation**	Investigation of groundwater quality by collection and analysis of water quality data supplemented by borehole geophysical data where available		✓			Current Conditions (Implemented)	NA	NA	**Implemented**	NA	2025	2025-	**0**	**0**	✓				✓	NA	NA	$5,000	$0	NA
EWMA-4	**Local Native Yield Estimation Study**	Improved estimation of local (EWMA) native yield by use of additional field-collected data and analysis	✓				Current Conditions (Implemented)	NA	NA	**On-going**	Current Conditions	2025	2025-	**0**	**0**					✓	NA	NA	$30,000	$0	EWMA assessments
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	SGMA Implementation Grant, EWMA Assessments
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	SGMA Implementation Grant, EWMA Assessments
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing												
KSB-10	**RMW Data Gaps**	Seven new groundwater monitoring wells will be added to the groundwater level monitoring network. This addition of monitoring wells is necessary to address groundwater level monitoring network data gaps as identified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
EWMA-5	**Aquifer-Specific Monitoring Wells Installation**	Construction of aquifer-specific monitoring wells in locations with data gaps, to better understand hydraulic heads and gradients, particularly in confined bedrock units	✓	✓			Current Conditions	NA	Drilling Permit, WCRs	**Planning**	Funded, implement in 2025	2025	2025-	**0**	**0**					✓	NA	DWR	$900,000	$0	DWR TSS funding
EWMA-6	**Pressure Transducers Installation**	Installation of pressure transducers in selected wells of the monitoring network, to collect high-resolution cost-effective data	✓				NA	NA	NA	**Planning**	Funded, implement in 2024	2025	2025-	**0**	**0**					✓	NA	NA	$50,000	$2,000	DWR $7.6M grant
EWMA-7	**Agricultural Demand Reduction**	Maintain and improve 2024 Subbasin well inventory in the DMS platform with added data from field surveys, current beneficial use determinations, and coordination with Kern County Environmental Health and DWR to track new wells, etc.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	EWMA Assessments
EWMA-8	**Groundwater Usage Fee Assessment**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	EWMA Assessments
EWMA-9	**Transferrable Water Credit Program**	Establish a system of transferrable water credits; including legal and administrative review: effects of CEQA and water law on joint management of native yield	✓			Demand Reduction	Program will be initiated once rules and regulations are finalized	Stakeholder Meetings, Board Meetings	TBD	**Initiating Development**	NA	2030	2030-	**0**	**0**			✓			Surface water & groundwater	GSA	$80,000	$20,000	EWMA Assessments

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the estimated "deficit" of 3,940 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

EWMA-7 Agricultural Demand Reduction – Reduction of irrigated acreage, or modification of irrigation techniques or crop types to reduce water usage. Currently, the basin model estimates the native yield as 0.15 acre-feet per acre, and KSB-4 (Coordination with Basin Study) will improve the estimate of native yield. Once the basin study is completed, the EWMA will review the updated water budget and implement this management action.

EWMA-9 Transferrable Water Credit Program – Establish a system of transferrable water credits. This project will require coordination with KSB-4 (Coordination with the Basin Study), and evaluation of any legal requirement to implement. Once the basin study is completed, a system of transferrable water credits will be refined using a technical and legal approach prior to implementation in 2025.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in Appendix **C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MAs

Water Supply Augmentation P/MAs are the secondary means of Implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 3,940 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented or in-process that contribute to water supply augmentation include:

EWMA-1, Produced Water Supply Project – Development of oilfield produced water supplies to potentially reduce groundwater demand. The EWMA has begun identifying produced water projects and several EWMA irrigators have already initiated produced water projects resulting in a water supply augmentation of over 1,000 AFY.

EWMA-2 Surface Runoff Capture – Develop surface runoff capture and enhanced infiltration in impoundments. This potential project will require further legal and engineering feasibility studies to determine the viability and potential yields of a project. KSB-4 (Coordination with the Basin Study) will assist in the initial technical feasibility of this project.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated

IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.

e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by EWMA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented. In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional. In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process. Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As Needed. As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MAs, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the EWMA GSA has a Pre-SGMA net water budget deficit of 3,336 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the EWMA GSA has a deficit of 3,317 AFY, similar to the historical period. The P/MA combined portfolio represented herein is expected to eliminate the deficit and avoid Undesirable Results by reducing demand and increasing supply within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

P/MAs are expected to provide benefits related to water quantity. Water supply augmentation P/MAs benefits can be measured by the flow of those projects (i.e. from flow meters on ponds, etc.). For P/MAs with indirect supply augmentation, benefits can be evaluated by comparing against a baseline scenario to measure those benefits.

Understanding and quantifying P/MA benefits will assist in understanding if progress is being made toward achieving the basin sustainability goal.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Produced Water

Produced water is available on a continual, 365-day basis due to the operation of oil production and is therefore a very reliable and consistent source of water.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

EWMA is a non-profit entity and an associate member of the Kern Non-Districted Lands Authority GSA which possesses the legal authority to implement P/MAs discussed herein. Furthermore, the EWMA is working on forming a water district and ultimately a GSA which will retain its own authority to implement P/MAs in its boundaries.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to

otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for EWMA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

East Water Management Area	Estimated Costs	
	One-time	Annual
Implemented	$35,000	$95,000
Functional	$2,950,000	$50,000
In-Process	$1,855,000	$182,000
As-Needed		
Total	**$4,840,000**	**$327,000**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

The EWMA does not employ any artificial groundwater recharge projects.

Henry Miller Water District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

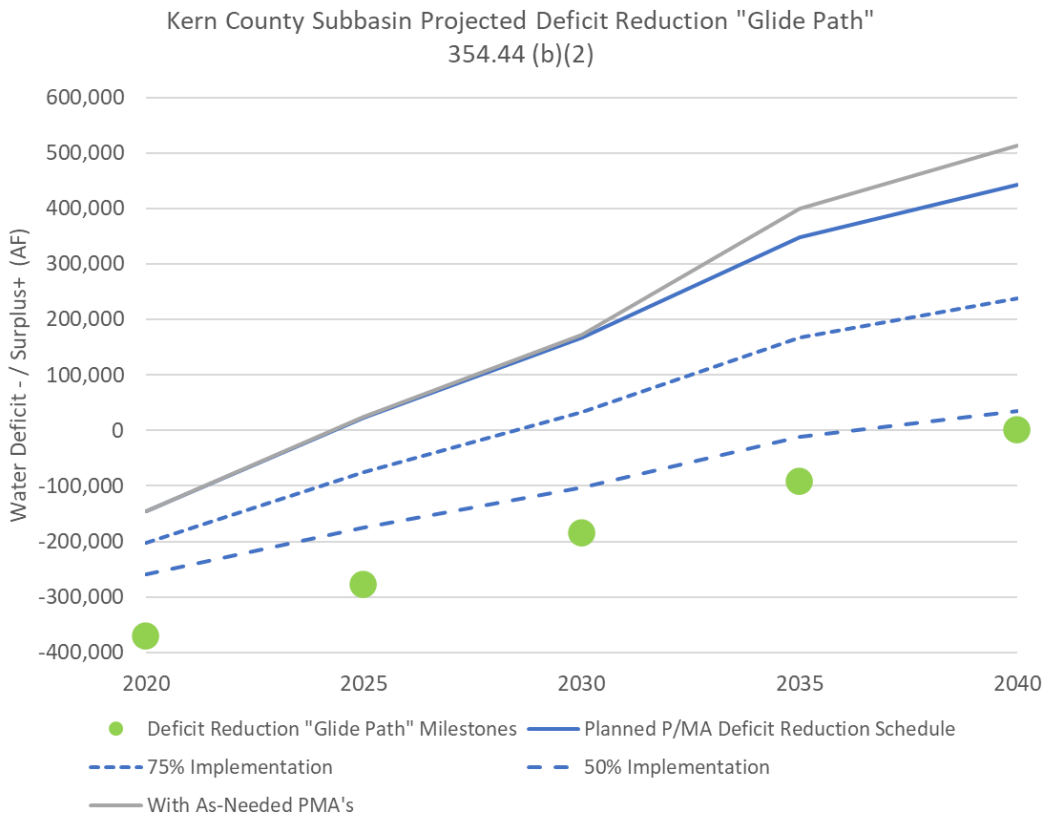


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

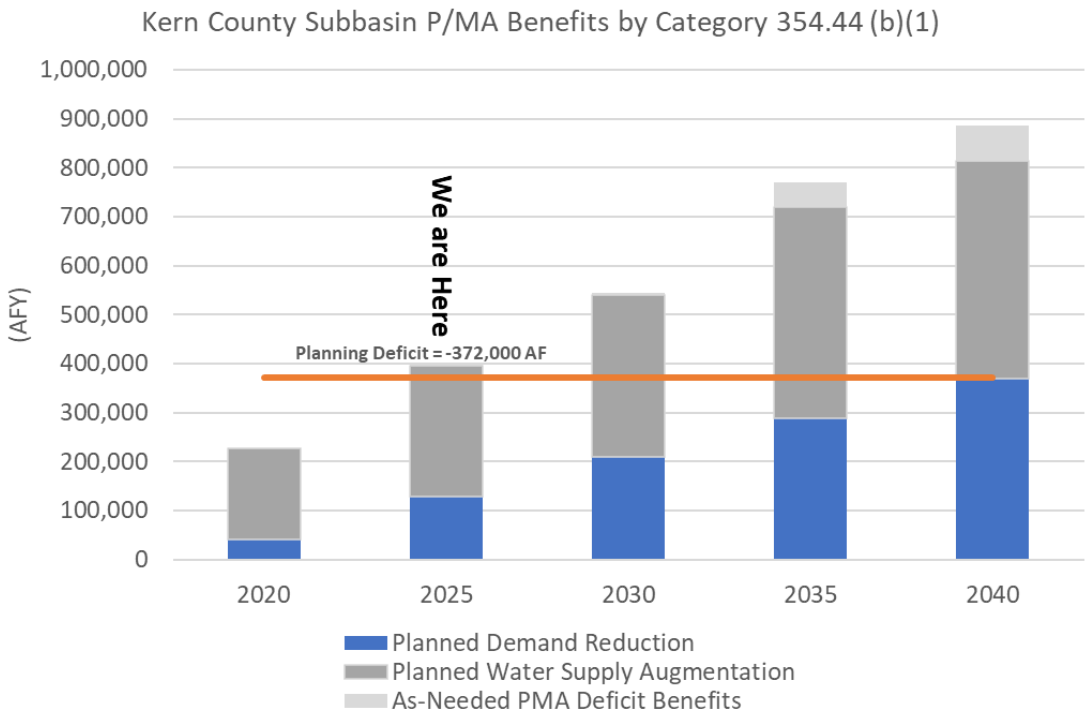


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Henry Miller Water District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for HMWD GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (1,488 AFY) of the projected deficit of 5,950 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Henry Miller Water District GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-5,950			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-1,488**	**-2,975**	**-4,463**	**-5,950**
Deficit Reduction "Glide Path" Milestones		**-5,950**	**-4,463**	**-2,975**	**-1,488**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction	0	1238	2725	4213	5700
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**1,238**	**2,725**	**4,213**	**5,700**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking	250	250	250	250	250
	New Local Supply					
	Exercise of Rights					
	Subtotal	**250**	**250**	**250**	**250**	**250**
P/MA Implementation Schedule*		**250**	**1,488**	**2,975**	**4,463**	**5,950**
Total As-Needed P/MA Deficit Benefits		*0*	*550*	*550*	*550*	*550*
Planned P/MA Deficit Reduction Schedule*		**-5,700**	**-4,462**	**-2,975**	**-1,487**	**0**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

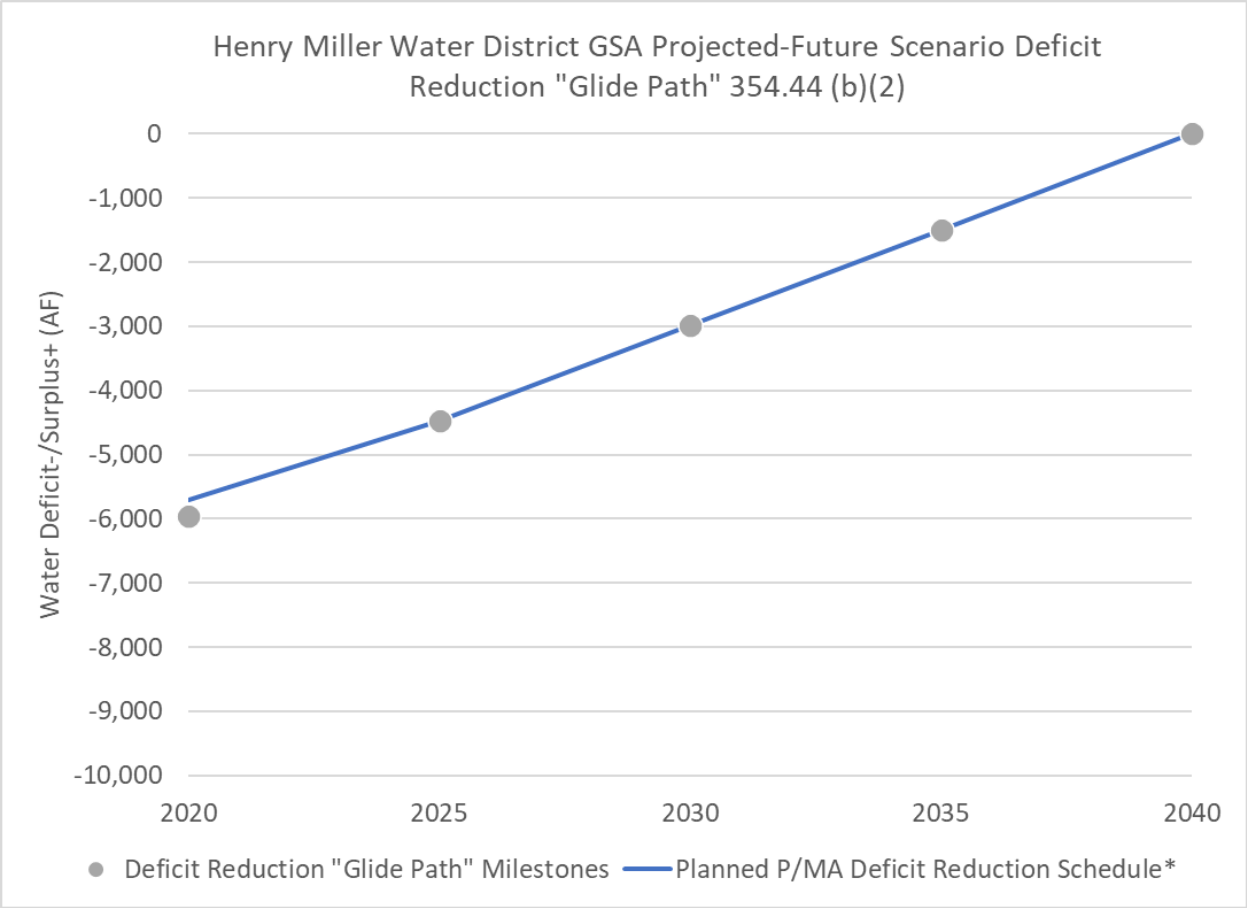


Figure 3. P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example HMWD-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

PMA Number	PMA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process		As-Needed									Implemented	Functional		In-Process			As-Needed					
HMWD-1	Demand Reduction due to Land Fallowing	The District irrigable lands now total less than 1/3 permanent crops, with over 2/3 of the lands being available to implement this project in future years as necessary to maintain sustainability over the long-term.	✓	✓	✓	Demand Reduction	Complete	NA	NA	Implemented	Complete	Complete	2020-	0	0-26,300			✓		NA	NA	None	NA	NA	NA
HMWD-2	Maximize Water Banking during Wet Years	GSA will maximize water banking in wet years by using excess surface water supplies and purchasing water for the Pioneer Water Bank	✓	✓	✓	Third-Party Banking Supplemental Recharge	Complete	NA	NA	Implemented	Complete	Complete	2020-	0	0	✓	✓	✓		NA	SWP, Kern River, CVP, other surface supplies	None	NA	NA	HMWD (Water Charge)
HMWD-3	Recovery of Banked Supplies from the Pioneer Project	Recovery of banked surface water from the Pioneer Banking Project at times when the District has capacity, in order to reduce groundwater use within the District.	✓	✓	✓	Third-Party Banking	Complete	NA	NA	Implemented	Complete	Complete	2020-	250	0	✓		✓		NA	SWP, Kern River, CVP, other surface supplies	None	NA	$37,500	HMWD (Water Charge)
HMWD-9	Agricultural Well Mitigation	GSA mitigation for any future failure of an agricultural well within HMWD GSA that was due to lowering of groundwater levels from groundwater pumping within HMWD GSA.	✓	✓	✓	NA	When declining groundwater levels impact agricultural wells.	Public GSA or District Board Meetings	NA	Implemented	Complete	Complete	2020-			✓	✓	✓	✓	NA	NA	None	$0	Variable, Up to $900,000	HMWD (Water Charge)
HMWD-10	Domestic Well Mitigation	GSA mitigation for any future failure of a domestic or small community well that was due to lowering of groundwater levels from groundwater pumping within HMWD GSA after completion of an attribution analysis proving that HMWD GSA was at fault.	✓	✓	✓	NA	When declining groundwater levels impact domestic or small community wells.	Public GSA or District Board Meetings	NA	As Needed	Complete	Complete	2024-			✓	✓	✓	✓	NA	NA	None	$0	Variable, Up to $45,000	HMWD (Water Charge)

PMA Number	PMA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process		As-Needed									Implemented	Functional		In-Process			As-Needed					
HMWD-4	Utilizing Surface Water In-Lieu of Groundwater During Wet Years	During years with above normal hydrology, the GSA will use surface water to satisfy water demands and minimize groundwater pumping to the greatest extent possible.	✓	✓	✓	Exercise of Rights	Complete	NA	NA	Implemented	Complete	Complete	2020-	0	0	✓	✓	✓		NA		None	NA	NA	NA
HMWD-6	Reduce Groundwater Pumping within 5.0 MI CA Aqueduct Corridor to Reduce Subsidence Potential	Although it is unclear whether prior GSA pumping has led to subsidence within the 5.0 MI CA Aqueduct monitoring corridor, the GSA will actively seek to prioritize use of wells outside the monitoring corridor and reduce corridor pumping relative to pre-SGMA conditions to reduce or avoid future land subsidence.	✓	✓	✓	NA	Complete	NA	NA	Implemented	Complete	Complete	2015-	0	0	✓	✓	✓	✓	NA	NA	None	NA	NA	NA

HMWD-7	**No Increase of Groundwater Production Capacity within 5.0 MI CA Aqueduct Corridor to Reduce Subsidence Potential**	Although it is unclear whether prior GSA pumping has led to subsidence within the 5.0 MI CA Aqueduct monitoring corridor, the GSA will avoid increasing groundwater production capacity within the monitoring corridor to reduce or avoid future land subsidence.	✓	✓	✓	NA	Complete	NA	NA	**Implemented**	Complete	Complete	2015-	**0**	**0**	✓	✓	✓	✓	NA	NA	None	NA	NA	NA
HMWD-8	**Groundwater Well Registration for All Active Wells within the GSA**	To fill any remaining data gaps on types of beneficial users and locations of groundwater wells to assist with Management Actions such as targeted location specific decreases in groundwater production, the GSA will conduct a field survey to verify the existence and construction details of active wells within the GSA.	✓	✓	✓	NA	Complete	NA	NA	**Implemented**	Complete	Complete	2024-	**0**	**0**	✓	✓	✓	✓	✓	NA	None	NA	NA	NA
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	HMWD (Water Charge)
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	HMWD (Water Charge)
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		NA	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	HMWD (Water Charge)
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	HMWD (Water Charge)
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	HMWD (Water Charge)
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
HMWD-5	**Surface Water Transfer from El Rico GSA (Tulare-Lake Subbasin) to HMWD GSA**	HMWD has the ability to transfer surface water from the El Rico GSA to HMWD as an emergency supply in times of drought and can also be transferred in wet years for banking or correcting previous overdraft.	✓	✓	✓	Exercise of Rights	As Needed	NA	NA	**As Needed**	Complete	Complete	2023-	**550**	**0**	✓	✓	✓		NA	SWP, SVP, other surface supplies	None	NA	$5,000	HMWD (Water Charge)

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the currently identified “deficit” of 1,330 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented that contribute to water demand reduction include:

HMWD-1 Demand Reduction due to Land Fallowing – This P/MA includes the ability to fallow up to 66% of developed district lands to maintain sustainability over time, representing a maximum annual demand reduction benefit of approximately 26,300 AFY compared to the P/MA checkbook timeframe of 1995-2014. The scale of annual implementation of this P/MA ranges from 0 to 26,300 AFY. The demand reduction was quantified by comparing the average annual crop demand from the 1995-2014 period to the expected average annual crop demand with up to 66% of developed lands being fallowed with P/MA HMWD-1. As is mentioned above, although the demand management action provides a pre-defined up to maximum benefit on a year-to-year basis, the GSA does not expect to realize an average demand reduction action of 26,300 AFY for every year moving forward, but may choose to implement the maximum one-year benefit as conditions require, as was done in the 2022 water year, or as little as 0 AFY as conditions allow.

The landowners within the District have been fallowing lands in times of drought since before the formation of the District in the 1960’s. Thus, the GSA in coordination with its landowners can implement this P/MA in any year type and realize the benefits immediately especially in response to drought, or continued drought conditions. During wet years when available surface water supplies to the District are plentiful, the GSA can reduce the required demand reduction while still maintaining sustainability within the GSA. The GSA may temporarily reduce the scale of implementation of this P/MA for multiple years, followed by the increased implementation of this P/MA in following years to manage groundwater levels to Measurable Objectives and maintain sustainable groundwater operations within the GSA over the long-term.

Water Supply Augmentation P/MA’s

Water Supply Augmentation P/MAs are the secondary means of Implementation of a “Glide Path” that will result in closing the balance of the currently identified “deficit” of 5,950 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented that contribute to water demand reduction include:

HMWD-3 Recovery of Banked Supplies from the Pioneer Project – This P/MA involves the recovery of banked water from the Pioneer Banking Project to reduce groundwater use within the District, resulting in supply augmentation of approximately 250 AFY. The P/MA yield was determined using the following calculations and assumptions, rounded to the nearest 50 acre-feet:

- Kern R. April-July Runoff POA When Recovery for HMWD is Possible: 55-90%
- Frequency of Kern River Year Type from 1995-2023: 6/29 or 21%
- Typical Pioneer Recovery Capacity: 85 cfs-days or 5,128 acre-ft/month
- Typical Simultaneous Participating Member Units or Districts: 8 Units
- Recovery Capacity per Unit: 5,128 acre-ft/month / 8 Units = 641 acre-ft/month
- Annual Recovery Capacity Assuming 3 Months of Operation: 1,282 acre-ft/yr
- Average Annual Capacity for HMWD GSA: 1,282 acre-ft/yr * 21% = 250 acre-ft/yr

HMWD-4 Utilize Surface Water In-Lieu of Groundwater – The District will use surface water in lieu of groundwater to the fullest extent possible to satisfy water demands in all years, irrespective of hydrology. The landowners within the District have been using surface water in-lieu of groundwater since before the formation of the District in the 1960's.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

HMWD-6 Reduce Groundwater Pumping within 5.0 MI CA Aqueduct Corridor to Reduce Subsidence Potential – Although it is unclear whether prior GSA pumping has led to subsidence within the 5.0 MI CA Aqueduct monitoring corridor, the GSA will actively seek to prioritize use of wells outside the monitoring corridor and reduce corridor pumping relative to pre-SGMA conditions to reduce or avoid future land subsidence. This Management Action has already been implemented and is further highlighted in the HMWD GSA GSP Chapter 14 Blue Pages.

HMWD-7 No Increase of Groundwater Production Capacity within 5.0 MI CA Aqueduct Corridor to Reduce Subsidence Potential – Although it is unclear whether prior GSA pumping has led to subsidence within the 5.0 MI CA Aqueduct monitoring corridor, the GSA will avoid increasing groundwater production capacity within the monitoring corridor to reduce or avoid future land subsidence. This Management Action has already been implemented and is further highlighted in the HMWD GSA GSP Chapter 14 Blue Pages.

HMWD-8 Groundwater Well Registration for All Active Wells within the GSA – To fill any remaining data gaps on types of beneficial users and locations of groundwater wells to assist with Management Actions such as targeted location specific decreases in

groundwater production, the GSA will conduct a field survey to verify the existence and construction details of active wells within the GSA. This Management Action has already been implemented and is further highlighted in the HMWD GSA GSP Chapter 14 Blue Pages.

HMWD-9 Agricultural Well Mitigation – The GSA plans to mitigate any future failure of an agricultural well within HMWD GSA that was due to lowering of groundwater levels from groundwater pumping within HMWD GSA. This Management Action has already been implemented and is further highlighted in the HMWD GSA GSP Chapter 14 Blue Pages.

HMWD-10 Domestic Well Mitigation – The GSA plans to mitigate any future failure of a domestic or small community well that was due to lowering of groundwater levels from groundwater pumping within HMWD GSA after completion of an attribution analysis proving that HMWD GSA was at fault. Since the GSA does not have any domestic wells or drinking water well beneficial uses or users within the GSA, HMWD-10 applies only to potentially affected domestic wells in neighboring GSAs.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Kern Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Kern Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Kern Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with

a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by HMWD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Several P/MAs have been identified and listed "**As Needed**" on Table 3 and could further reduce the deficit if needed, as summarized below:

HMWD-5 Surface Water Transfer from El Rico GSA to HMWD GSA – This P/MA involves an existing long-term common landowner transfer agreement for up to 66,000 AF State Water Project (SWP) Table A Water between Tulare Lake Basin Water Storage District (TLBWSD) and Henry Miller Water District (SWPAO# 23006). TLBWSD lies within the El Rico GSA within the Tulare Lake Subbasin, while HMWD lies within the HMWD GSA within the Kern County Subbasin. This P/MA can either provide supplemental surface water supplies during times of drought to reduce groundwater demands within the GSA or provide surplus supplies in wet years to increase banked surface water or replace prior groundwater overdraft. The P/MA yield was determined using the following calculations and assumptions:

Dry-Year Water Supply Augmentation:

- For the dry-year water supply augmentation analysis, the P/MA was assumed to be initiated in years when the SWP allocation was less than 10%
- State Water Project Allocation <10% Frequency from 2014-2023: 3/10 or 30%
- Annual Supply Available for Transfer: 3,300 acre-ft/yr (5% of Maximum)
- Average Annual Water Supply Augmentation for HMWD GSA: 3,300 acre-ft * 33% = 330 acre-ft/yr

Wet-Year Water Supply Augmentation:

- For the wet-year water supply augmentation analysis, the P/MA was assumed to be initiated in years when the SWP allocation was between 75-100%, concurrent with surplus non-SWP surface water supplies within TLBWSD
- Frequency of Surplus Surface Water Supplies within TLBWSD: 1/30 or 3%
- Annual Supply Available for Transfer: 6,600 acre-ft/yr (10% of Maximum)
- Average Annual Water Supply Augmentation for HMWD GSA: 6,600 acre-ft * 3% = 220 acre-ft/yr

Total Average Annual Water Supply Augmentation for HMWD-5:

- Dry-Year Water Supply Augmentation: 330 acre-ft/yr
- Wet-Year Water Supply Augmentation: 220 acre-ft/yr
- Total Water Supply Augmentation: 550 acre-ft/yr

It must be noted that given the low frequency and proportion of supply utilized from TLBWSD, implementation of this P/MA would not have a detrimental effect to TLBWSD or prevent the El Rico GSA or the Tulare Lake Subbasin from reaching their sustainability goal. Through the 2024 Water Year, this P/MA has only been utilized for wet-year water supply augmentation and has not yet been used in a drought year to reduce groundwater demands within HMWD GSA.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on *Tables P/MA-3* as: Implemented, Functional, In-Process, or As-Needed.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All the In-Process P/MAs will be implemented except for

circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Since the status of all HMWD GSA P/MAs is either **Functional** or **As-Needed** and have already been approved and undergone any required public notice processes, no additional public notice processes are required to allow implementation.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the HMWD GSA has a Pre-SGMA net water budget deficit of 6,057 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties within the GSA and includes stored surface water and groundwater owned by the GSA/District within other Subbasin GSAs. The HMWD GSA presently has positive storage balances within both the Pioneer and Kern Water Bank GSAs, and does not have any water in storge within its boundary that is owed to other parties. For the Post-SGMA period between 2015-2023, the HMWD GSA has not only eliminated the pre-SGMA deficit, but has generated a substantial surplus by the implementation of several early P/MA's including significant reduction of water demands through land fallowing compared to the historical period. These efforts eliminated the historical deficit and have created a positive water budget of 4,427 AFY for 2015-2023 without the inclusion of accumulated stored surface water and groundwater owned by the GSA/District within the Pioneer and Kern Water Bank GSAs. When the Pioneer GSA and Kern Water Bank GSA accumulations are included, the HMWD GSA had a positive water budget of

12,715 AFY within the Subbasin for 2015-2023. Thus, the HMWD GSA has achieved sustainability early in the SGMA Implementation Period and has accumulated a substantial surplus that will ensure that the GSA remains sustainable through 2040 and beyond. The P/MA combined portfolio represented herein is expected to continue the net balanced annual water budget of the early-SGMA implementation period and avoid Undesirable Results by reducing demand, increasing supply, and avoiding land subsidence within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (HMWD-2, HMWSD-3, HMWD-5) come from the following sources:

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, the unused or carryover water can be stored outside the contractor's place of service for future use. HMWD currently receives SWP water through a water supply contract (Firm Table 1 Entitlement 35,500 AF at 100% allocation) with Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. HMWD also purchases excess Article 21 water through its State Water Contractor for delivery to existing project recharge facilities using the Cross Valley Canal when such water is available.

Kern River Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. HMWD manages one of the Kern River appropriate water rights, known as the Carmel Right, owned by its largest landowner. The Carmel Right is discussed further below:

- The Buena Vista Water Storage District (BVWSD), Miller & Lux, Associates, and all modern successors own water rights in water entitled at the Second Point of Measurement on the Kern River as successors in interest to the parties of the First Part to the 1888 Miller-Haggin Agreement. These water rights are collectively known as the Second Point water right.
- The Carmel Cattle Company owned 10.415% of the Second Point water rights as a successor in interest of the parties to the Miller-Haggin Agreement. The Carmel Cattle Company conveyed 6.459% of the Second Point water rights to BVWSD and retained 3.956% of the Second Point water rights by way of the 1945 Agreement. The water right that was retained by The Carmel Cattle Company is known as the Carmel Water Right. HMWD's largest landowner now owns and is entitled to 87.25% of the Carmel Water Right, or 3.452% of the Second Point Water Right, and delivers supplies from this right to the lands within HMWD and HMWD GSA. The Carmel Right managed by HMWD has yielded approximately

5,000 acre-ft/year on average, with lower amounts in dry years and higher amounts in normal and above-normal years.

Additional Water Sources

Typically during above-normal or wet hydrologic conditions for the Kern River, HMWD has access to additional Kern River water supplies made available through water service agreements with the City of Bakersfield and the Kern County Water Agency (KCWA). The most substantial additional water supply comes from the Lower River Right that is owned by KCWA and offered to its member units based on the proportion of their SWP Table 1 contract. The quantity of Lower River water typically available to HMWD can range from 3,000 to 15,000 acre-feet depending on the degree of above-normal Kern River hydrology. Lastly, since certain lands within HMWD are subject to a flood servitude in favor of Buena Vista Water Storage District (BVWSD), from time-to-time HMWD has made arrangements with BVWSD to divert and beneficially use BVWSD's Kern River water stored in these lands when water storage has taken place.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

HMWD GSA does not have any existing or planned in-District groundwater recharge/storage projects.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The HMWD is a water district, that possesses the legal authority to implement P/MAs discussed herein. HMWD GSA is also a GSAs, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges

Estimated costs for HMWD GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Henry Miller Water District GSA	Estimated Costs	
	One-time	Annual
Implemented	$0	$1,032,500
Functional		
In-Process	$25,000	$50,000
As-Needed	$0	$50,000
Total	**$25,000**	**$1,132,500**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, the primary means by which deficits will be addressed is through implementing P/MAs that reduce demand. Additionally, water supply augmentation from additional outside sources of water will provide protection to avoid any water supply deficits that cannot be eliminated through demand reduction alone.

Kern Non-Districted Land Authority GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address

25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

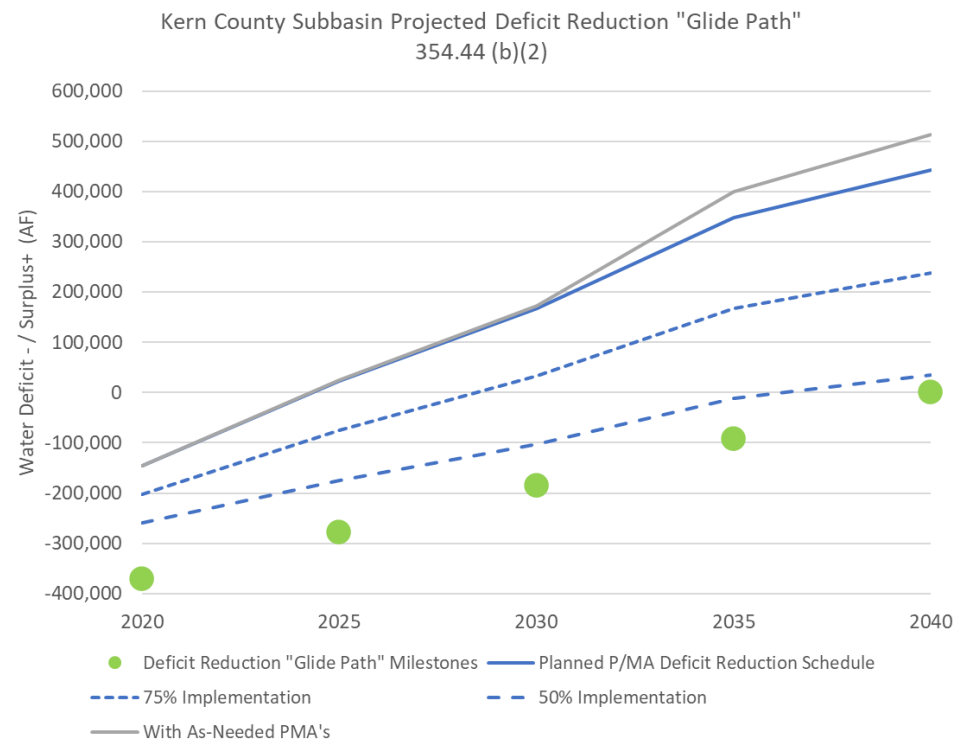


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

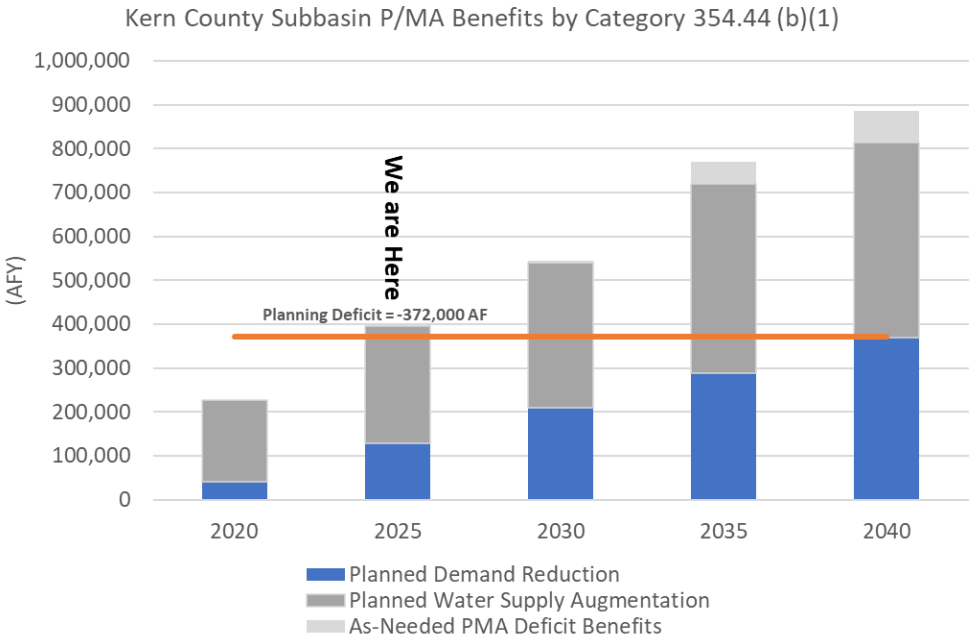


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Kern Non-Districted Land Authority GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for KNDLA GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 50 percent (11,960 AFY) of the projected deficit of 23,920 AFY during each five-year milestone 2030 through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
KNDLA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-23,920			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-5,980**	**-11,960**	**-17,940**	**-23,920**
Deficit Reduction "Glide Path" Milestones		**-23,920**	**-17,940**	**-11,960**	**-5,980**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction				11,960	23,920
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**0**	**0**	**11,960**	**23,920**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**0**	**0**	**0**	**0**	**0**
P/MA Implementation Schedule*		**0**	**0**	**0**	**11,960**	**23,920**
Total As-Needed P/MA Deficit Benefits						
Planned P/MA Deficit Reduction Schedule*		**-23,920**	**-23,920**	**-23,920**	**-11,960**	**0**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

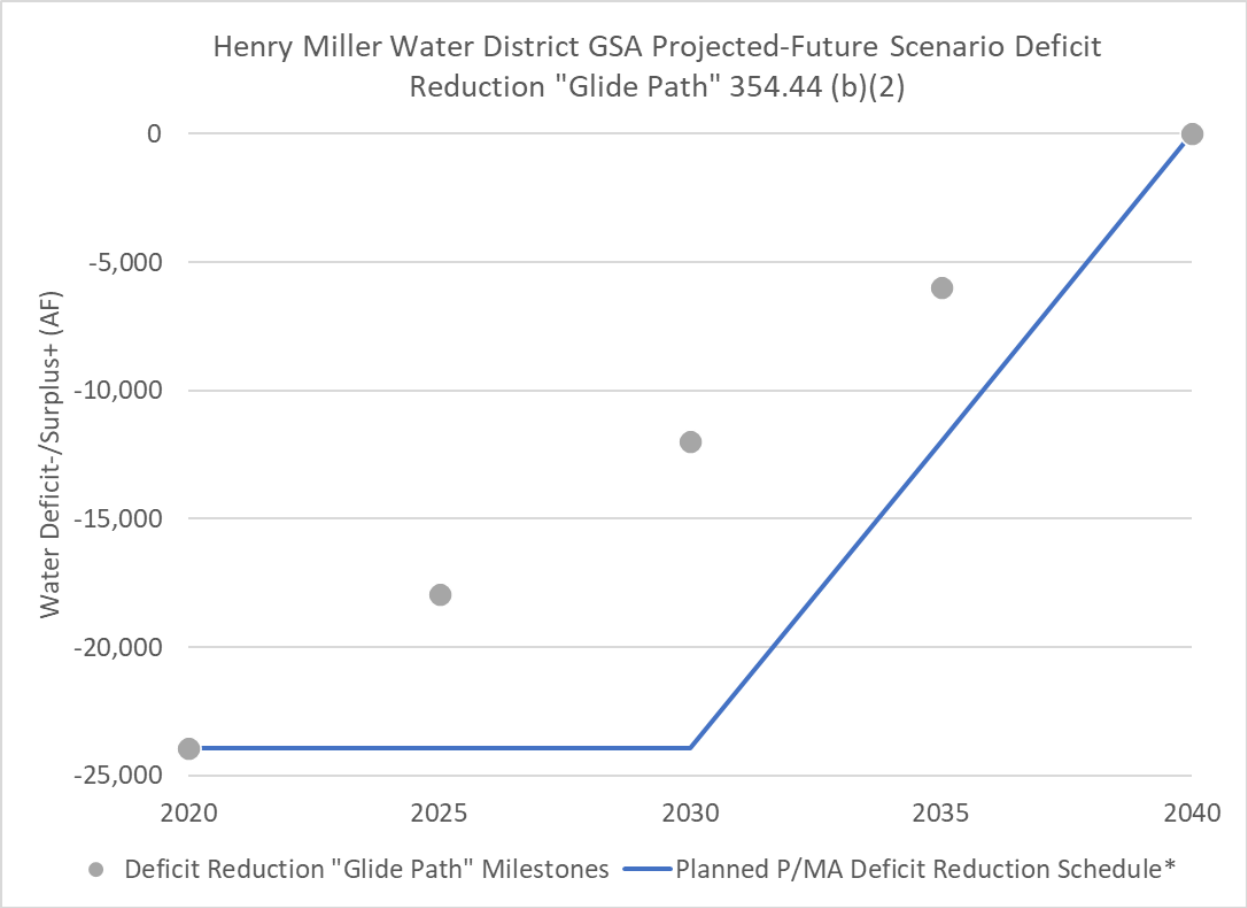


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example KNDLA-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

PMA Number	PMA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary										
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process			As-Needed								Implemented	Functional		In-Process				As-Needed					
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	Assessments and/or water charges

PMA Number	PMA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary										
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process			As-Needed								Implemented	Functional		In-Process				As-Needed					
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	

KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		NA	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs, estimated at 23,920 AFY of benefits, are the primary means of implementation of a "Glide Path" that will result in closing the identified "deficit" of 23,920 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in process that contribute to water demand reduction include:

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AFY over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

No current Water Supply Augmentation P/MAs are planned at this time.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than

of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

No P/MAs have been identified at this time.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are

planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed.**

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA’s, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects’ infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the KNDLA GSA has a Pre-SGMA net water budget deficit of 23,949 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other

parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the KNDLA GSA has a net water deficit of 23,098. The P/MA combined portfolio represented herein is expected to eliminate the deficit and avoid Undesirable Results by reducing demand within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

Not applicable.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Not applicable.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

Currently twenty water districts, resource conservation districts, irrigation districts, and water conservations districts within the Subbasin have banded together to form the KNDLA, a joint powers authority under the California Joint Exercise of Powers Act (California Government Code § 6500-6599.3) and a GSA pursuant to Cal. Water Code § 10723.6(a)(1). Each of the general members of KNDLA is a local public agency that has water supply, water management, or land use responsibilities within the Subbasin. (Cal. Water Code § 10721(n)). One of the members of KNDLA, the Kern County Water Agency, has service area jurisdiction that includes the entire Subbasin, including all of the area within the KNDLA GSA boundaries. Pursuant to Water Code section Water Code sections 10725 to 10726.8, the KNDLA was formed within the jurisdictional boundaries of its member agencies and has the legal authority to implement P/MAs, including the demand management P/Mas discussed herein. In addition to this authority, the KNDLA has entered into an agreement with the Kern County Water Agency, ensuring that the KNDLA will indemnify the Kern County Water Agency for any KNDLA action or management within its boundaries. This arrangement is consistent with the intent of the legislature in enacting SGMA, to manage groundwater basins

through the actions of local governmental agencies to the greatest extent feasible. (Cal. Water Code § 10720.1(h)).

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.

Estimated costs for KNDLA GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Kern Non-Districted Lands (KGA) GSA	Estimated Costs	
	One-time	Annual
Implemented	$0	$95,000
Functional		
In-Process	$25,000	$60,000
As-Needed		
Total	**$25,000**	**$155,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

Not applicable.

Kern-Tulare Water District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

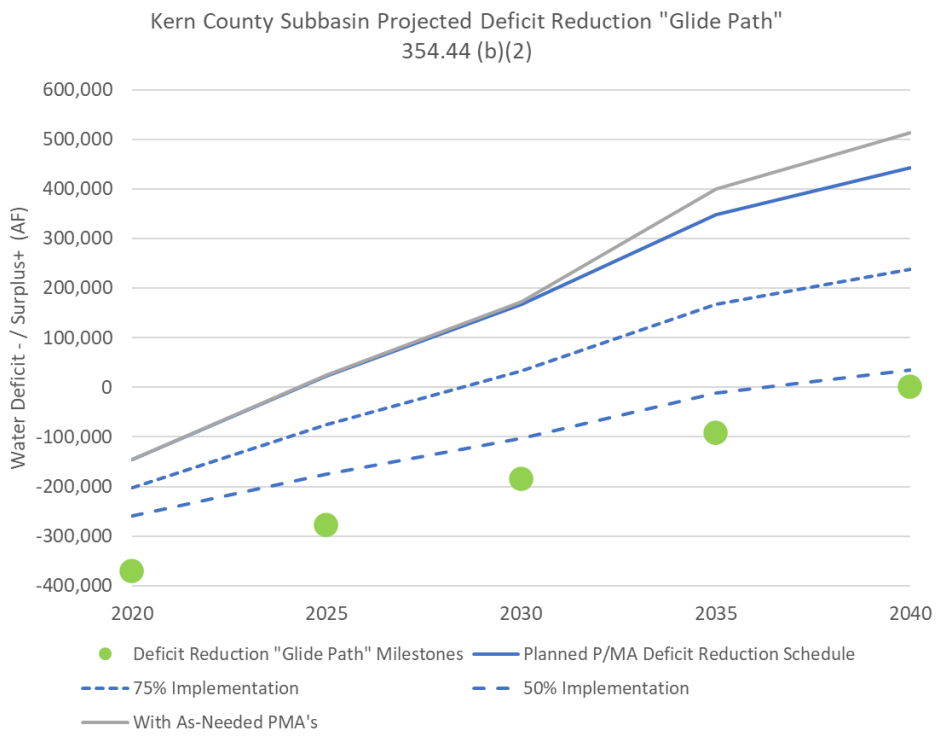


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

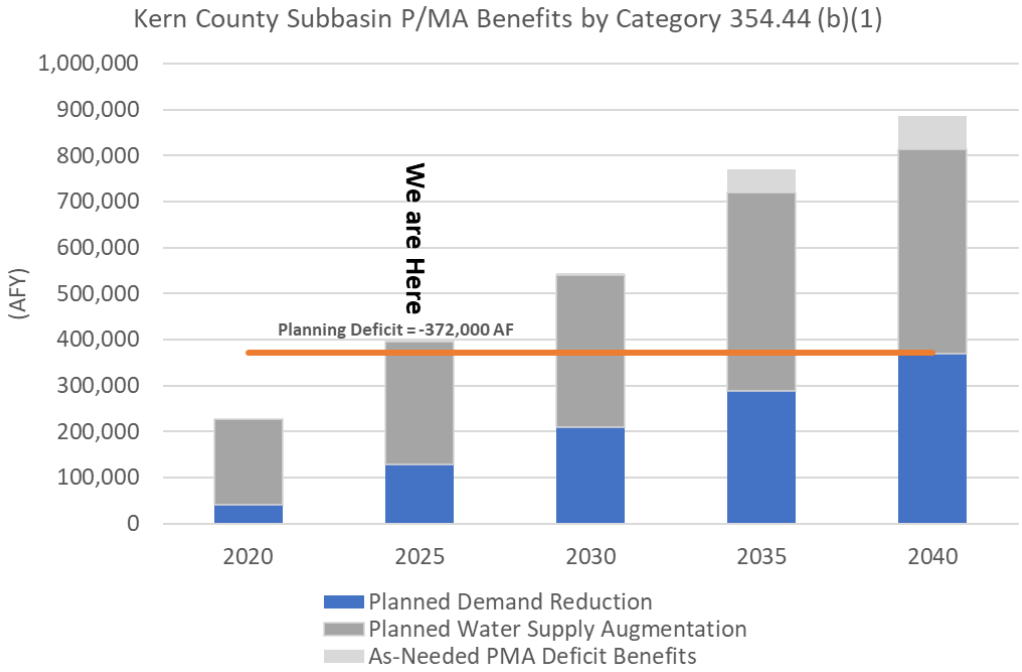


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Kern-Tulare Water District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for KTWD GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (0 AFY) of the projected deficit of 0 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2025.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Kern-Tulare Water District GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction		5,580	5,580	5,580	5,580
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**5,580**	**5,580**	**5,580**	**5,580**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights	0	2,140	2,140	2,140	2,140
	Subtotal	**0**	**2,140**	**2,140**	**2,140**	**2,140**
P/MA Implementation Schedule*		**0**	**7,720**	**7,720**	**7,720**	**7,720**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*3,000*	*3,000*	*14,470*
Planned P/MA Deficit Reduction Schedule*		**0**	**7,720**	**7,720**	**7,720**	**7,720**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

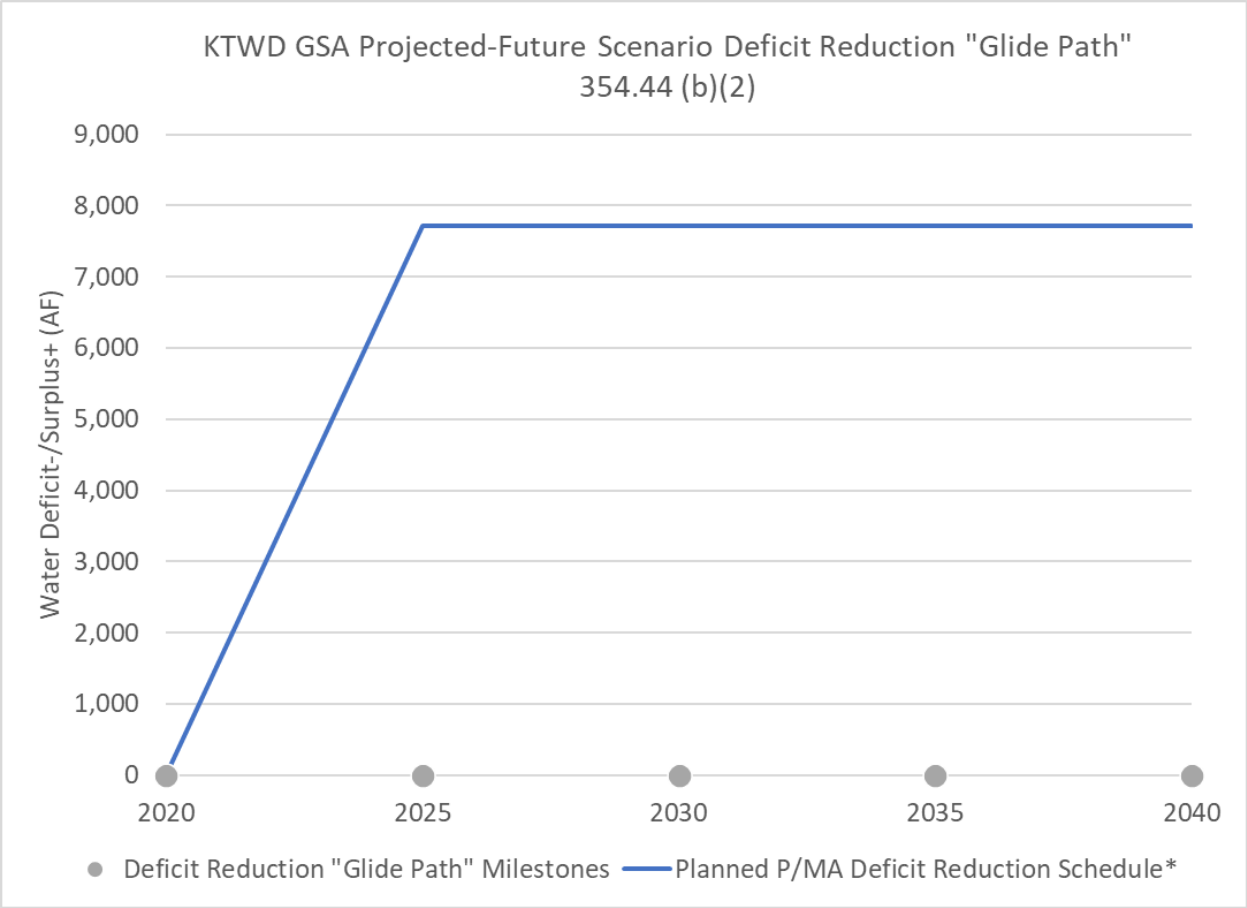


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example RRB-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed					
KTWD-1	**Connect Rag Gulch and Ave 4 Systems**	Construction of 0.5 miles of 15-inch pipeline between the Avenue 4 distribution system and the Rag Gulch distribution system increases the delivery capability to 2,089 acres in the Rag Gulch and Avenue 4 distribution systems from 4.0 to 4.9 gpm/acre. The project will increase surface water deliveries by an estimated 260 AF per year.	✓	✓	✓	Exercise of Rights		Stakeholder Meetings Board Meetings		**Implemented**		2023	2024-	**260**		✓		✓				CVP supplies	None	$180,000	$0	KTWD Water Charges
KTWD-2	**Quinn Pumping Plant and Pipeline**	Construction of the Quinn Pumping Plant and Pipeline includes a 400 HP pumping plant, 3.5 miles of distribution system piping, and 4 turnouts. The project will improve delivery capability to 3,544 acres to increase surface water deliveries and reduce groundwater pumping by an estimated 1,130 AF per year in years of adequate water supply.	✓	✓	✓	Exercise of Rights		Stakeholder Meetings Board Meetings Prop 218 Special Assessment	Complete	**In-Process**	2023	2025	2025-	**1130**		✓		✓				CVP supplies	None	$2,500,000	$0	KTWD Special Assessment
KTWD-3	**Improved Conveyance to Ave 24**	Constructs the necessary improvements to the North distribution system to allow for 177 acres that are within the District and reliant upon groundwater to be added to the Service Area. The Project includes installation of 0.7 miles of 18-inch diameter pipeline and replacement of the 16-inch diameter pipeline crossing of Avenue 24 with a 30-inch pipeline. Project will increase surface water deliveries by an estimated 480 AF per year.	✓	✓	✓	Exercise of Rights		Stakeholder Meetings Board Meetings Prop 218 Special Assessment	Complete	**In-Process**	2023	2025	2025-	**480**		✓		✓				CVP supplies	None	$600,000	$0	KTWD Special Assessment
KTWD-4	**Replace Twin Pipes Pumping Plant**	Increasing the horsepower at the Twin Pipes pumping plant from 200 HP to 400 HP will improve the delivery capability to 1,488 acres in the Twin Pipes service area from 3.8 gpm/acre to 5.2 gpm/acre. The project will increase surface water deliveries by an estimated 270 AF per year.	✓	✓	✓	Exercise of Rights		Stakeholder Meetings Board Meetings		**In-Process**	2024	2025	2025-	**270**		✓		✓				CVP supplies	None	$400,000	$0	KTWD Water Charges
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	Unknown
KTWD-5	**Provide Full Service to Southern Service Area**	Replacement of Cecil Pumping Plant and Pipeline, construction of Intertie Pumping Plant and Pipeline, and construction of Grapefruit Pumping Plant and Pipeline to satisfy peak season irrigation demands to over 13,500 acres in the southern portion of the District. Project is estimated to increase the annual delivery capability of the District by 9,470 AF in wet and normal years.	✓	✓	✓	Exercise of Rights	Funding	Stakeholder Meetings Board Meetings Prop 218	CEQA/NEPA	**As-needed**		2035-2040	2040-	**9470**		✓						CVP supplies	None	$25,000,000	$0	KTWD; Grants
KTWD-6	**Produced Water Project - Phase 2**	The District has historically accepted produced water to provide surface water to the District and has the opportunity to obtain additional sources of produced water	✓		✓	New Local Supply	As needed	Stakeholder Meetings Board Meetings	WDR	**As-needed**		2025-2030	2030-	**3000**		✓		✓				Produced Water Supplies	None	$5,900,000	$0	KTWD; Private
KTWD-7	**In-District Surface Storage**	The District has selected two potential reservoir sites with a total capacity of 8,000 AF to capture wet year water.	✓	✓	✓	Supplemental Water Use	As needed	Stakeholder Meetings Board Meetings Prop 218	CEQA/NEPA	**As-needed**		2035-2040	2040-	**2000**		✓	✓	✓				CVP water, additional wet year water for purchase	None	$30,000,000	$0	KTWD; Grants

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented		Functional	In-Process				As-Needed					
KTWD-8	**Modify District Pricing Structure**	Reduce groundwater pumping by providing a pricing mechanism that causes groundwater to cost more than surface water. Implement a "groundwater charge" for every acre-foot pumped and install meters on all ag wells.	✓	✓	✓	Demand Reduction	Complete	Stakeholder Meetings Board Meetings Majority Protest Hearing	Complete	**Implemented**	Complete	Complete	2024-		**5580**	✓		✓				CVP supplies	GSA Authority	$500,000	$10,000	Landowners
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓		NA	NA	$0	$25,000	KTWD General Funds
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	KTWD General Funds
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	KTWD General Funds; Water Charges
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	KTWD General Funds
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	KTWD General Funds
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	KTWD General Funds
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	KTWD General Funds

KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing															
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" of 970 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

KTWD-8 Modify District Pricing Structure – Includes reducing groundwater pumping by providing a pricing mechanism that causes groundwater to cost more than surface water. The District Implemented a "groundwater charge" for every acre-foot pumped and install meters on all ag wells. The District calculates demand reduction of 5,580 AFY through this P/MA.

Each year the KTWD's Board of Directors sets the surface water price for water users based on the blended water rates of the various sources of KTWD's water supply. This price is highly dependent upon hydrology and availability of water supplies. There are times when the cost of District water is more expensive than the cost to pump groundwater. During these times, some water users choose to pump groundwater instead of using surface water due to the cost difference.

The most affordable way to reduce groundwater pumping is to provide a pricing mechanism that causes groundwater to cost more than surface water. This is accomplished by implementing a "groundwater charge" for every acre-foot pumped. Water Code §35533 provides the District the authority to collect groundwater charges. Revenue from the groundwater charge could be used to implement management actions or to reduce the cost to deliver surface water from the District.

Implementing the groundwater pumping charge required the following be accomplished:

1. Conducted a "Majority Protest" procedure under Proposition 218.
2. Installed meters on all groundwater wells (or use an equivalent form of metering).
3. Set up procedures to read groundwater meters and charge for groundwater pumping.

KTWD began charging for groundwater in March 2024.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability.

Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2.** Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" by 970 AFY by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented or in-process that contribute to water supply augmentation include:

KTWD-1 Connect Rag Gulch and Ave 4 Systems - Includes construction of 0.5 miles of 15-inch pipeline between the Avenue 4 distribution system and the Rag Gulch distribution system. This increases the delivery capability to 2,089 acres in the Rag Gulch and Avenue 4 distribution systems from 4.0 to 4.9 gpm/acre. The project will increase surface water deliveries by an estimated 260 AF per year. This project was completed in 2023.

KTWD-2 Quinn Pumping Plant and Pipeline - Includes construction of the Quinn Pumping Plant and Pipeline including a 400 HP pumping plant, 3.5 miles of distribution system piping, and 4 turnouts. The project will improve delivery capability to 3,544 acres to increase surface water deliveries and reduce groundwater pumping by an estimated 1,130 AF per year in years of adequate water supply.

KTWD-3 Improved Conveyance to Ave 24 - Includes construction of a necessary improvement to the North distribution system to allow for 177 acres that are within the District and reliant upon groundwater to be added to the Service Area. The Project includes installation of 0.7 miles of 18-inch diameter pipeline and replacement of the 16-inch diameter pipeline crossing Avenue 24 with a 30-inch pipeline. Project will increase surface water deliveries by an estimated 480 AF per year.

KTWD-4 Replace Twin Pipes Pumping Plant - Increasing the horsepower at the Twin Pipes pumping plant from 200 HP to 400 HP will improve the delivery capability to 1,488 acres in the Twin Pipes service area from 3.8 gpm/acre to 5.2 gpm/acre. The project will increase surface water deliveries by an estimated 270 AF per year.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to

subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Kern Subbasin will continue to coordinate with various water quality regulatory programs implemented by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program (ILRP), Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related

to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern

Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Several projects and management actions have been identified and listed "As Needed" on Table 4 and could reduce the deficit by up to 14,470 AFY if needed as summarized below:

KTWD-5 Provide Ful Service to Southern Service Area - Replacement of Cecil Pumping Plant and Pipeline, construction of Intertie Pumping Plant and Pipeline, and construction of Grapefruit Pumping Plant and Pipeline to satisfy peak season irrigation demands to over 13,500 acres in the southern portion of the District. Project is estimated to increase the annual delivery capability of the District by 9,470 AF in wet and normal years.

- KTWD-6 Produced Water Project- Phase 2 - The District has historically accepted produced water to provide surface water to the District and has the opportunity to obtain additional sources of produced water.

KTWD-7 In-District Surface Storage - The District has selected two potential reservoir sites with a total capacity of 8,000 AF to capture wet year water.

KTWD-9 KTWD GSA Domestic Well Program- In March 2023, DWR provided a guidance document entitled "*Considerations for Identifying and Addressing Drinking Water Well Impacts*" which includes an adaptive management framework and how GSAs can consider the interests of drinking water well users at each step through implementation of their GSPs. KTWD GSA staff presented the guidance document to the GSA board in July 2023 and outlined the 7 components of adaptive management:

1. Identify Drinking Water Well Users
2. Perform Public Outreach
3. Understand Basin Conditions
4. Evaluate Monitoring Network And Representative Monitoring Sites
5. Evaluate Sustainable Management Criteria
6. Develop And Implement Projects And Management Actions
7. Continue Engagement And Fill Data Gaps

Figure 4 summarizes the GSA's implementation of DWR's guidance document. Based on the guidance document, KTWD GSA conducted a domestic well survey to identify all drinking water well users within the GSA and revised the GSA's monitoring network and SMCs based on the domestic wells The GSA has 8 domestic wells (4 in Tule and 4 in Kern) within its jurisdiction and therefore efforts must be made to understand the potential impacts on domestic well users and to develop management actions that ensure impacts are either prevented or mitigated by the GSA.

As a result, KTWD-9 Domestic Well Program was developed to ensure the GSA has the best available information and is addressing the needs of the domestic wells within its jurisdiction. The Domestic Well Program includes three components:

- Domestic Well Assessment
- Domestic Well Monitoring
- Domestic Well Mitigation

KTWD GSA is partnering with Self-Help Enterprises (SHE), a community development organization, to develop a comprehensive Domestic Well Program. This program aims to:

- Analyze the vulnerability of drinking water well users within the GSA by conducting a Domestic Well Assessment for the 8 domestic wells
- Monitor groundwater level and groundwater quality conditions specific to domestic wells
- Provide mitigation and relief services to impacted domestic wells

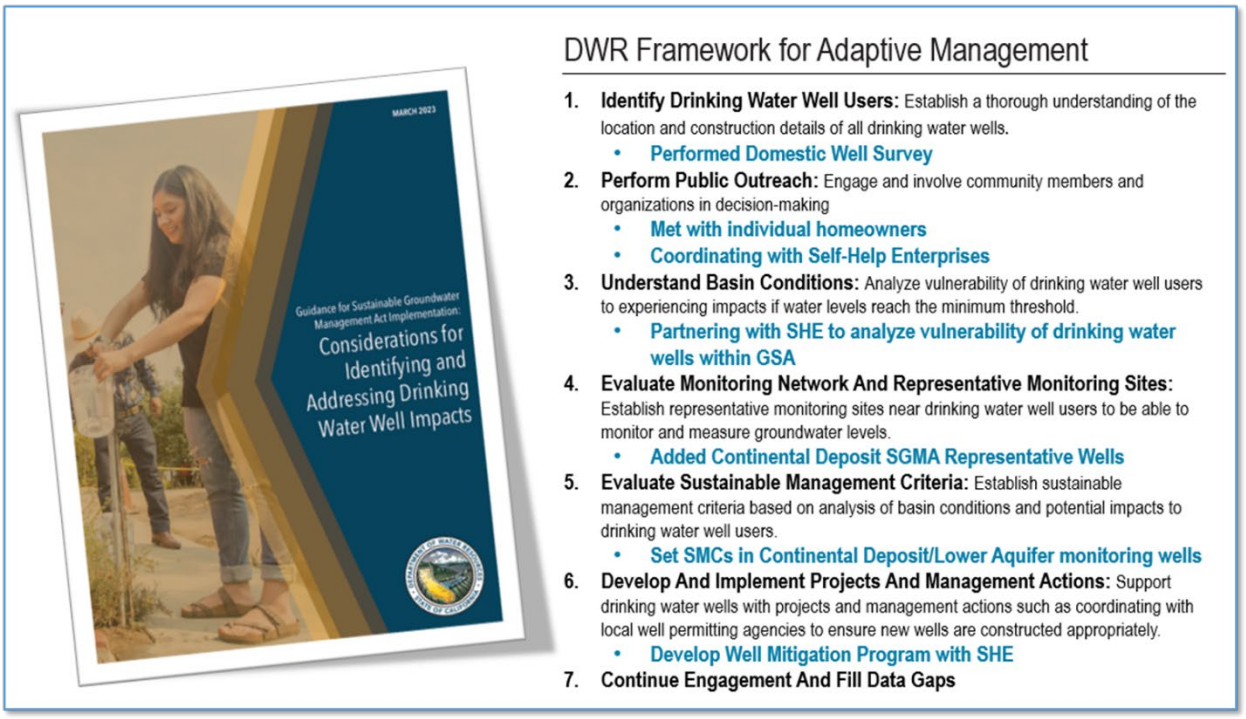
KTWD GSA entered into an agreement with SHE to conduct the first step of the Domestic Well Program – a domestic well assessment. SHE's Domestic Well Assessment scope of work includes the following:

1. Project Management
    a. Conduct outreach to domestic well owners within KTWD GSA
    b. Schedule well assessments
    c. Obtain Access Authorization from property owners to allow well assessment and sampling on their property
2. Conduct on-site assessment of the water supply well to include:
    a. Collect historical well reports/documentation
    b. Locate and confirm water source, check for running water
    c. Assess standing water level
    d. Inspect electrical and above-ground plumbing components
    e. Inspect existing tank systems
    f. Document findings and develop a site map

3. Perform water quality testing of well water supply
    a. Collect water quality samples
    b. Deliver samples to ELAP certified laboratory
    c. Evaluate and review water quality test results
4. Education
    a. Provide copies of the well assessment findings and water quality results to each household
    b. Educate property owner on proper operation and maintenance of the water supply well and the potential health effects of any identified contaminants
    c. Notify property owner of available resources to assist with water supply and water quality issues
5. Reporting
    a. Submit copies of the well assessments and water quality results to KTWD GSA
    b. Submit a report summarizing findings to the KTWD GSA

In July 2024, SHE began the well assessment by conducting on-site visits to all domestic wells identified by the GSA. The GSA is currently awaiting SHE's report summarizing the findings of the well assessment. KTWD GSA will continue to work with SHE to develop appropriate monitoring measure for its domestic well users within the GSA. KTWD GSA and SHE have committed to developing a comprehensive Well Mitigation Program based on the results of the assessment and have entered into a Domestic Well Mitigation Agreement. Based on the GSA's own initial assessment of domestic well impacts, the GSA is prepared to reserve $90,000 in funding to mitigate potential domestic well impacts within the GSA. Once the SHE assessment is completed the GSA will reevaluate its reserve account obligation.

Figure 4. KTWD GSA's Implementation of DWR's Drinking Water Well Impacts Guidance Document



Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the Kern-Tulare Water Distrct GSA has a Pre-SGMA net positive water budget 3,687 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. For the Post-SGMA period between 2015-2023, the KTWD GSA has a deficit of 1,153 AFY which is being reversed by the implementation of several early P/MA's and reduction of demands specifically the implementation of P/MA KTWD-8 (Modifying District Pricing Structure). The P/MA combined portfolio represented herein is expected to continue the net positive annual water budget of the (1995-2023) period and avoid Undesirable Results by reducing demand and increasing supply within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction

management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 1. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the “Glide Path” level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water augmentation P/MAs (KTWD-1, KTWD-2, KTWD-3, KTWD-4) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. KTWD has two Cross Valley Contracts with the United States Bureau of Reclamation (Reclamation) for a combined total of up to 53,300 acre-feet per year of CVP water and a Friant Class 2 Contract for up to 5,000 acre-feet per year of CVP water. KTWD also has access to water from the following associated sources: Recovered Water Account (RWA), Unreleased Restoration Flows (URF), Recapture & Recirculation (R/R), and Section 215 water. KTWD also purchases Class 1 and Class 2 water supplies from other Friant Contractors and purchases CVP water from other South of Delta contractors.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. KTWD has received SWP water through water transfer agreements with various State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

KTWD currently receives Kern River water when it is available through water service agreements with the City of Bakersfield.

Produced Water

KTWD executed a 20-year contract with Hathaway, LLC in 2016 to receive produced water. The District currently receives about 2,400 acre-feet per year of water from this source on the east side of the District, which is delivered to the District's Big 4 reservoir to be blended with other water sources before being distributed. The source of oilfield produced water is from exempted aquifers beneath and hydrologically separated from the fresh-water bearing zones of the basin.

3rd Party Programs

KTWD has developed long-term groundwater banking programs with North Kern Water Storage District (North Kern), Rosedale-Rio Bravo Water Storage District (Rosedale-Rio Bravo), and West Kern Water Storage District (West Kern) to deliver excess water when surface supplies are available and to extract groundwater during years of inadequate supplies.

The North Kern project yields an annual dry year supply of up to 5,000 acre-feet. The agreement requires the KTWD to bank water before it can be extracted and leave 10 percent of the water banked in North Kern to account for losses.

The Rosedale-Rio Bravo project yields an estimated dry year annual supply of up to 9,000 acre-feet. The agreement requires KTWD to bank 2.13 acre-feet for each acre-foot extracted and to bank water before it can be extracted.

The West Kern project yields an estimated dry year annual supply of up to 2,000 acre-feet. The agreement requires KTWD to bank 2 acre-feet for each acre-foot extracted and bank water before it can be extracted.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The KTWD is a water district, that possesses the legal authority to implement P/MAs discussed herein. KTWD GSA is also a GSAs, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein. KTWD is also a GSA for those lands within its boundaries. KTWD has entered into SGMA contracts with certain landowners outside of KTWD's water service area that are within the boundary of KNDLA. Pursuant to such SGMA contracts and KTWD's membership in KNDLA, KTWD has the authority to include these areas outside the KTWD service area in its GSA boundaries and otherwise impose P/MAs, including demand management, on the lands that are subject to the contracts. KTWD is also a general member of the KNDLA and has entered into an agreement with KNDLA providing KTWD the jurisdiction to implement P/MAs, including the demand management P/MAs discussed herein, on those lands outside of the KTWD boundary but within the KNDLA boundary where KTWD has contracted with the landowner for SGMA purposes. This arrangement is consistent with the intent of the legislature in enacting SGMA, to manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible. (Cal. Water Code § 10720.1(h)).

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be

incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments, water charges and/or groundwater charges.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for KTWD GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Kern-Tulare Water District GSA	Estimated Costs	
	One-time	Annual
Implemented	$680,000	$105,000
Functional		
In-Process	$3,525,000	$60,000
As-Needed	$60,900,000	$0
Total	**$65,105,000**	**$165,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater

levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Kern River GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage "deficit" of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document~~s~~, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA~~s~~. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path <u>Kern County Subbasin</u>

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on *Figure 1*. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on *Figure 1* for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. *Figure 1* and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

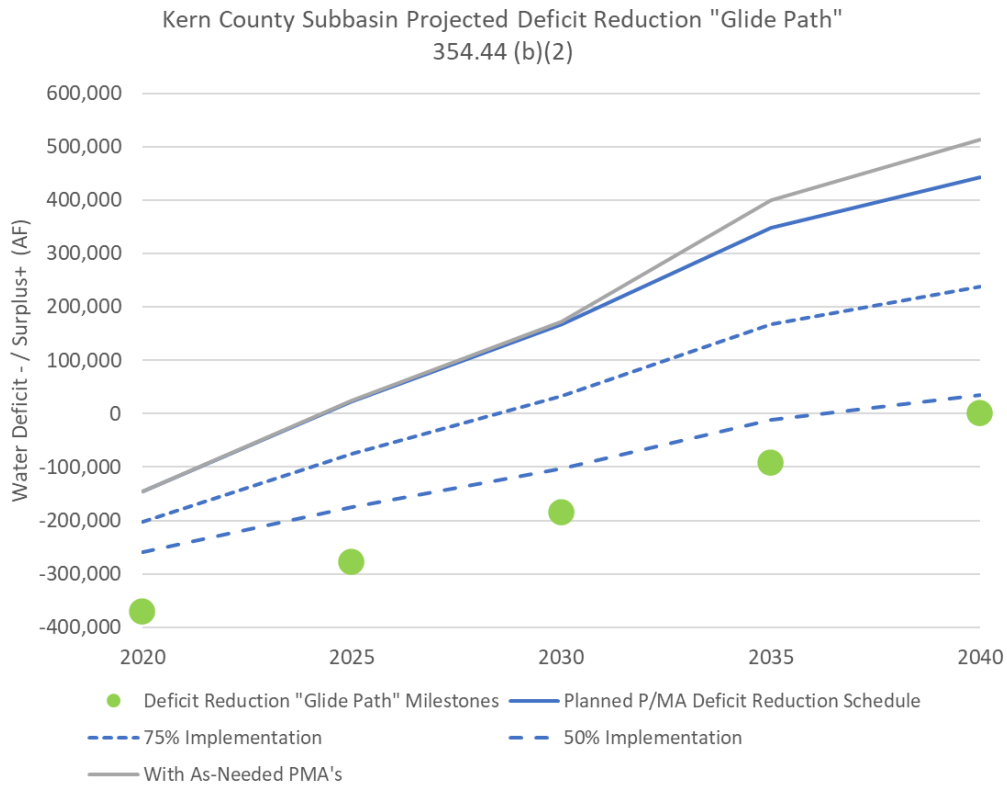


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

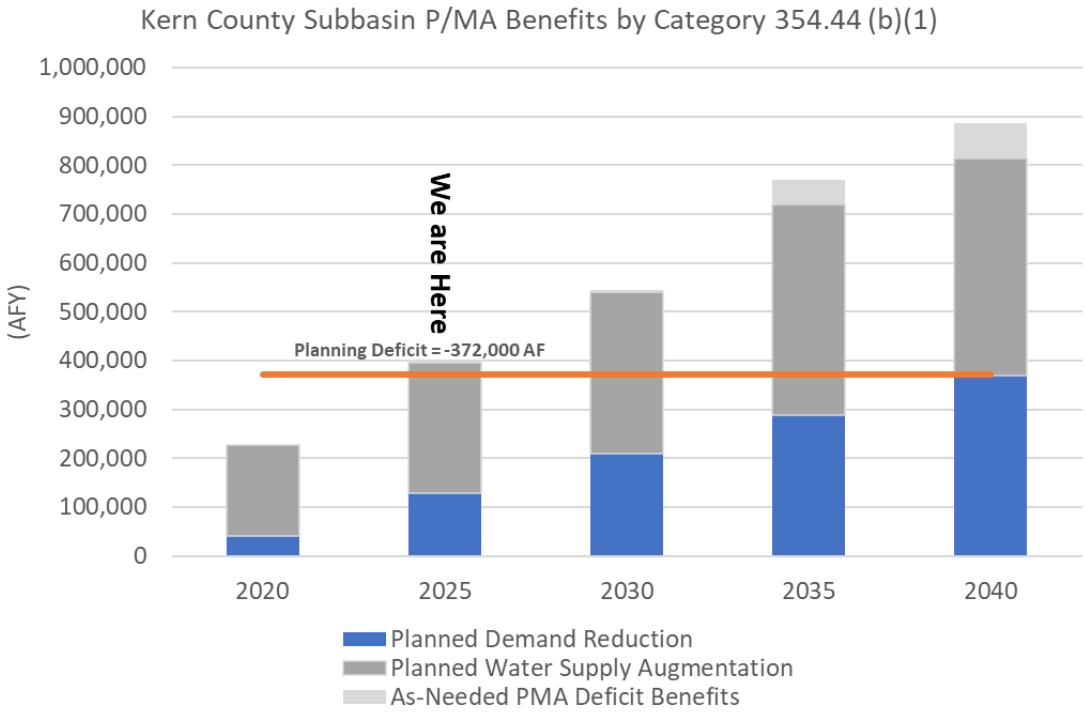


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Kern River GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Kern River GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (15,555 AFY) of the projected deficit of 62,220 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020. The optimization of water rights will increase water supply to KRGSA but may not necessarily increase water supply to the basin as whole.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern River GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-62,220			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-15,555**	**-31,110**	**-46,665**	**-62,220**
Deficit Reduction "Glide Path" Milestones		**-62,220**	**-46,665**	**-31,110**	**-15,555**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction					
	Ag to Urban Conversion	389	6,750	13,500	20,250	27,000
	Water Conservation-Efficiency	21,299	21,299	21,299	21,299	21,299
	Subtotal	**21,688**	**28,049**	**34,799**	**41,549**	**48,299**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply			13,407	13,407	13,407
	Exercise of Rights	88,727	88,727	88,727	88,727	88,727
	Subtotal	**88,727**	**88,727**	**102,134**	**102,134**	**102,134**
P/MA Implementation Schedule*		**110,415**	**116,776**	**136,933**	**143,683**	**150,433**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**48,195**	**116,776**	**136,933**	**143,683**	**150,433**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

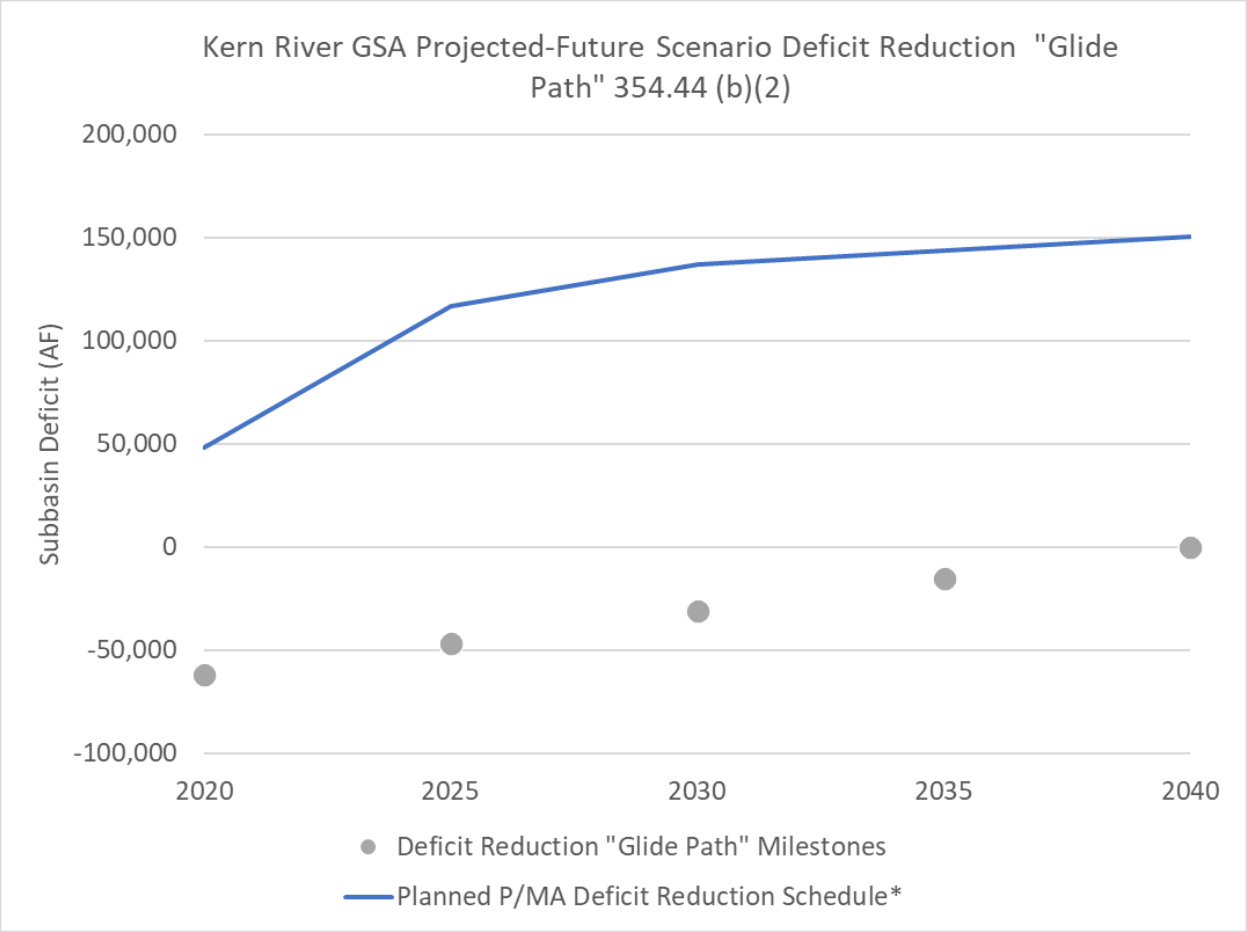


Figure 3. P/MA-5 (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example KRGSA-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed							Implemented				Functional		In-Process				As-Needed					
KRGSA-1	**Water Allocation Plan**	KDWD plans to use its full Kern River entitlement as prioritized in its Water Allocation Plan (WAP) for the Agricultural MA.	✓	✓	✓	Exercise of Rights	Complete	KDWD, Board Meetings & Website	CEQA (completed)	**Implemented**	Complete	2018	2018-	**20,797**	**0**			✓			Kern River Supplies	None	$0	$0	KDWD, Operating Budget
KRGSA-2	**Kern River Optimized Conjunctive Use**	The City plans to use its full Kern River entitlement, less current obligations, to mitigate undesirable results for water levels and water quality in the Urban MA.	✓	✓	✓	Exercise of Rights	Complete	COB, City Council Meetings & Website	CEQA (As Needed)	**Implemented**	Complete	2018	2018-	**67,930**	**0**			✓			Kern River Supplies	None	$0	$0	COB, Operating Budget
KRGSA-3	**Lining of Pool #8**	The Kern County Water Agency's (Agency) - Improvement District No. 4 (ID4) Cross Valley Canal (CVC) Extension Lining Project – Pool No. 8 (Project) includes installation of approximately 5,280 lineal feet of fiber-reinforced concrete lining on an existing earthen canal to reduce seepage and improve water delivery reliability. The lining will reduce seepage, increase water delivery reliability, reduce maintenance efforts and reduce the potential for canal breaches.	✓				Already being implemented	KCWA, UBAC, Board Meetings & Website	CEQA & NEPA (completed)	**Implemented**	2023	2024	2024-	**0**	**0**			✓			Surface Supplies	KCWA, ID4	$7,000,000	$0	ID4 Grants Received
KRGSA-4	**Urban Conservation**	Future urban demand will be reduced from current modeled levels. The average urban demand for Metropolitan Bakersfield is reported by local UWMPs is 211 gallons per capita per day (gpcpd). Previous estimates for future demand were estimated at 248 gpcpd and basin wide GSP modelling included this estimate in all future model scenarios.	✓	✓	✓	Water Conservation-Efficiency	Already being implemented	COB, City Council Meetings & Website	None	**Implemented**	Ongoing (expected savings from 2020)	2040	2020-2040	**0**	**21,299**			✓			Demand Reduction	COB/Retail Urban Providers	NA	$0	COB, ENCSD, Lamont, Cal Water, Vaughn - Operating Budgets
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	KRGSA
KRGSA-5	**ENCSD North Weedpatch Highway Water System Consolidation**	Up to six small water systems in the northeast KRGSA will be consolidated into the ENCSD system for benefits to drinking water quality, including to disadvantaged communities (DACs). The project includes new water distribution systems, a new well (1,400 gpm capacity) with arsenic treatment, a storage tank, hydropneumatics tank, and a booster pump station. If TCP is detected in the new well, the grant will also fund a TCP treatment system. All wells with water quality violations will be properly abandoned according to Kern County Environmental Health regulations.		✓			In Progress	ENCSD, Board Meetings & Website	DDW	**In-Process**	2019	2024	2024-	**0**	**0**	✓		✓				COB/Retail Urban Providers	$0	$0	ENCSD and potential SAFER Grants
KRGSA-6	**South Kern and Old River Mutual Water System Consolidation**	Two small mutual water systems in the southern KRGSA will be consolidated into the City of Bakersfield's domestic water system for benefits to drinking water quality, including to disadvantaged communities (DACs). The Project will include new water distribution systems connecting the mutual water systems with the City's water system, which improve drinking water quality for the DAC.		✓			In Progress	COB, City Council Meetings & Website	DDW	**In-Process**	2022	2025	2025	**0**	**0**	✓		✓				COB, DDW	$7,500,000	$78,000	COB and potential SAFER Grants

KRGSA-7	**Expand Recycled Water Use in the KRGSA**	The City will increase recycled water use inside of the KRGSA from its WWTP No. 3 in 2026 when a contract for use outside of the KRGSA expires (about 72% is currently used outside of the KRGSA).	✓	✓	✓	New Local Supply	Already being implemented - Reallocates water	COB, City Council Meetings & Website	None	**In-Process**	Current	2026	2026-	**13,407**	**0**			✓			Recycled Water	None	NA	$0	COB Operating Budget
KRGSA-8	**Conversion of Agricultural Lands in Urban Use**	Approximately 10,000 acres of current KRGSA agricultural lands is expected to be urbanized; this future urban demand is already included in the projected water budget, so 100% of this agricultural water use represents a demand reduction.	✓	✓	✓	Ag to Urban Conversion	Land use changes	COB/Planning Commission, Board Meetings & Website	CEQA (As Needed)	**In-Process**	2020 (total expected by 2028)	2038	Total by 2038	**0**	**27,000**							None	NA	NA	NA

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		**Implemented** / **Functional** / **In-Process**		**As-Needed**									**Implemented**		**Functional**		**In-Process**			**As-Needed**					
Phase 1																									
KRGSA-9	**Implement Action Plan if Water Levels Fall Below Minimum Thresholds**	A five-step action plan for addressing exceedance of GSP thresholds, including KRGSA Plan Manager coordination: 1. Identify the Well(s) and investigate the Area 2. Coordinate with KRGSA Plan Managers 3. Select Appropriate Management Actions or Projects for Mitigation 4. Consider Institutional Changes for Future Mitigation 5. Consider the Need for Improved Monitoring	✓			Supplemental Water Use	MT exceedance	KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**	✓		✓				None	$0	$0	KRGSA
KRGSA-10	**Optimize Conjunctive Use in the KRGSA**	Surface water sources available to the KRGSA will be prioritized for use when available, retaining the shared groundwater resources for periods when surface water is scarce. This balance of water use and higher reliance of groundwater during drought provides for increased reliability, higher groundwater levels to avoid undesirable results, and preservation of groundwater resources for other supplies are less available. Conjunctive management also encourages recharge of any excess surface water for storage and subsequent recovery to assist with drought management.	✓			Supplemental Water Use		KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**	✓		✓				None	$0	$0	KRGSA
KRGSA-11	**Support California Delta Conveyance Project to Preserve Imported Water Supplies**	In its UWMP, ID4 emphasizes the need for state-wide support in improving the availability and reliability of SWP supplies. On April 29, 2019, Governor Newsom announced that his administration will develop a water resiliency portfolio (Portfolio) intended to address a range of water-related challenges facing the state. The Portfolio will address unsafe drinking water, major flood risks, severely depleted groundwater aquifers, communities with uncertain water supplies and native fish populations.	✓	✓		Supplemental Water Use		KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**	✓						None	$0	$0	KRGSA
KRGSA-12	**Incorporate Climate Change Adaptation Strategies**	As noted in its 2015 UWMP (P&P, 2016), ID4 has identified strategies that can be adapted to fit within ID4 operations to address potential uncertainties associated with the reliability of imported water supplies. In brief, climate change may result in reduced surface water that will be even more unpredictable on a year-to-year basis. As listed in the UWMP, ID4 has identified the following measures for consideration: • Work with retail purveyors to identify impacts of demand management measures to improve the accuracy of overall ID4 future demands. New developments are incorporating the latest water conversation features and policies that may alter the current ID4 demand projections. • Continue water recharge activities to the extent practicable to increase reliability of supplies during dry-year conditions.	✓					KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**	✓						None	$0	$0	KRGSA

KRGSA-13	**Support Sustainable Groundwater Supplies for KRGSA Disadvantaged Communities**	The three founding KRGSA member agencies have established lines of communication and coordination with other agencies in the GSP Plan Area, many of whom provide water to DACs in the KRGSA Plan Area. In this manner, representation of these communities is considered in KRGSA actions and policies.	✓	✓				KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**				✓			None	$0	$0	KRGSA
KRGSA-14	**Improve Groundwater Monitoring in the KRGSA Plan Area**	It is the policy of the KRGSA to monitor groundwater for GSP compliance and to provide the understanding necessary for sustainable groundwater management. These actions will consist of: Improving documentation of well construction in the KRGSA Plan Area, coordinating water quality analysis through existing monitoring programs, securing inactive wells/dedicated monitoring wells, and obtaining access agreements for GSP monitoring network wells.	✓	✓				KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**				✓			None	$0	$0	KRGSA
KRGSA-15	**Avoid Widespread Impacts to Domestic and Small Water System Wells in the Plan Area**	This management action has been developed to provide clarity and more focused information on the issue of potential impacts to domestic and small water system wells. The new management action is based on an updated analysis of potential impacts to domestic and small water system wells throughout the entire Plan Area. It will consist of: Documenting Active Domestic and Small Water System Wells, Tracking the Potential for Impacts to Active Domestic and Small Water System Wells, Investigating Issues and Assisting Active Domestic and Small Water System Wells, Adjusting KRGSA Management Activities, (if Needed) and Updating Management Actions.	✓	✓				KRGSA, Board Meetings & Website	None	**Ongoing**	2022	NA	2020 -	**0**	**0**				✓			None	$0	$0	KRGSA
KRGSA-16	**Establish Well Metering Policy in the KRGSA**	This policy will assist with monitoring groundwater extractions for ongoing water budget analyses and compliance with SGMA reporting requirements. (Add specific member updates)	✓			Water Conservation-Efficiency		KRGSA, Board Meetings & Website	None	**Ongoing**	NA	2025	2020 -	**0**	**0**				✓			None	$0	$0	KRGSA
KRGSA-17	**Implement Groundwater Extraction Reporting Program**	As required by SGMA, the KRGSA will begin reporting extractions to DWR on an annual basis. In order to improve the accuracy of its reporting and to support the ongoing water budget analysis, KRGSA Plan Managers will implement a program for all well owners to report groundwater production to the GSA.	✓			Water Conservation-Efficiency		KRGSA, Board Meetings & Website	None	**Ongoing**	NA	NA	2020 -	**0**	**0**				✓			None	$0	$0	KRGSA

Phase 2																								
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	KRGSA
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	KRGSA
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	KRGSA
KRGSA-18	**Additional Urban Conservation Measures**	To reduce urban demand, additional conservation measures could be considered by the City and other urban retail water purveyors. Such actions are documented in the UWMPs and strict adherence to permanent reductions in urban demand by 2020 are underway. A decrease in the long-term per capita water use is provided in UWMPs and embedded in the projected water budgets for the KRGSA.	✓			Water Conservation-Efficiency	New Legislation	KRGSA, Board Meetings & Website	None	**Ongoing**	NA	2040	2020 -	**0**	**0**				✓			None	$0	TBD	KRGSA
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**				✓	NA	NA	$25,000	$0	KRGSA
KSB-6 (ID#4 only) (KDWD & Bakersfield not participating)	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	KRGSA
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	KRGSA
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	KRGSA
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing												

KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
KRGSA-19	**Conversion of Agricultural Lands**	Changes in land use may also result in a decrease in agricultural demand through urbanization. Some land conversion from agriculture to urban is anticipated in Phase One associated with growth projections for Metropolitan Bakersfield. Additional changes in land use to reduce water demand could be developed in Phase Two as needed.	✓			Ag to Urban Conversion	Urbanization	KRGSA, Board Meetings & Website	CEQA (As Needed)	**Ongoing**	2020	2040	As needed	**0**	**0**				✓			None	$0	As needed	KRGSA
KRGSA-20	**Additional Considerations for Adaptive Management**	It is recognized that demand reduction projects could have a detrimental impact on the local economy, livelihood of residents and business owners, and the well-being of Metropolitan Bakersfield and Kern County. Therefore, large-scale reductions are not proposed in Phase One and may be unnecessary for achieving the sustainability goal. At a minimum, such actions are delayed until later in the implementation period to allow water supply projects the opportunity to sustainably support current and projected growth in the beneficial uses of groundwater.	✓	✓	✓	Supplemental Water Use	As needed	KRGSA, Board Meetings & Website	None	**As Needed**	NA	NA	As needed	**0**	**0**				✓			None	$0	As needed	KRGSA
KRGSA-21	**Possible Water Exchange**	KRGSA member agencies can perform exchanges of surface water and groundwater for benefits to water quality, including to DACs.		✓		Supplemental Water Use	As needed	KRGSA, Board Meetings & Website	None	**As Needed**	NA	NA	As needed	**0**	**0**							None	$0	As needed	KRGSA
KRGSA-22	**Pumping Reductions and Allocation of Agricultural Groundwater Supply**	If sustainable management cannot readily be achieved through increased and optimized supplies, then pumping allocations may a helpful management tool. If needed, KDWD will explore options and opportunities for equitable allocation scenarios and engage landowners to develop workable allocations. Adjacent water districts are already developing such programs and KDWD may benefit from lessons learned and strategies incorporated by others. Agricultural demand could also be achieved if needed by growing different crop types, fallowing portions of fields, district purchase and retirement of land (and possibly used for recharge if suitable), and other strategies.	✓			Demand Reduction	Continued MT exceedance	KRGSA, Board Meetings & Website	TBD	**As needed**	NA	NA	As needed	**0**	**0**				✓			None	$0	As needed	KRGSA

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the currently identified “deficit” of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA Specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

KRGSA-4 Urban Conservation - The State suite of legislation requiring demand reduction for urban users, referred to “Conservation is a Way of Life”, will continue to reduce the per capita urban demand. As such, future urban demand will be reduced from current modeled levels. The average urban demand for Metropolitan Bakersfield as reported by local UWMPs is 211 gallons per capita per day (gpcd). Previous estimates for future demand were estimated at 248 gpcd and basin wide GSP modelling included this estimate in all future model scenarios.

KRGSA-8 Conversion of Agricultural Lands in Urban Use - Approximately 10,000 acres of current KRGSA agricultural lands is expected to be urbanized; this future urban demand is already included in the projected water budget, so 100 percent of this agricultural water use represents a demand reduction. The estimated irrigation demand on the agricultural parcels is expected to be 2.7 AF per acre, with a total demand reduction of 27,000 AF when all the projected ag land is converted to urban use. The increase in urban demand on these parcels is already included in future population-based water demand estimates.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land’s relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin’s ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of Implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA Specific Projects either currently being implemented or have been implemented that contribute to water demand reduction include:

KRGSA-1 Water Allocation Plan – KDWD plans to use its full Kern River entitlement as prioritized in its Water Allocation Plan (WAP) for the Agricultural MA.

KRGSA-2 Kern River Optimized Conjunctive Use – The City plans to use its full Kern River entitlement, less current obligations, to mitigate undesirable results for water levels and water quality in the Urban MA.

KRGSA-7 Expand Recycled Water Use in the KRGSA– The City will increase recycled water use inside of the KRGSA from its WWTP No. 3 in 2026 when a contract for use outside of the KRGSA expires (about 72% is currently used outside of the KRGSA).

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KRGSA-3 Lining of Cross Valley Canal (CVC) Extension Pool No. 8 – The KCWA Improvement District No. 4 (ID4) project includes installation of approximately 5,280 lineal feet of fiber-reinforced concrete lining on an existing earthen canal to reduce seepage and improve water delivery reliability. The lining will reduce seepage, increase water delivery reliability, reduce maintenance efforts and reduce the potential for canal breaches. While the project does not bring new water into the basin, it allows for the efficient use of water and allows water managers control to effectively manage the water system to reduce loss.

KRGSA-5 ENCSD North Weedpatch Highway Water System Consolidation – Up to six small water systems in the northeast KRGSA will be consolidated into the ENCSD system for benefits to drinking water quality, including to disadvantaged communities (DACs). The project includes new water distribution systems, a new well (1,400 gpm capacity) with arsenic treatment, a storage tank, hydropneumatics tank, and a booster pump station. If TCP is detected in the new well, the grant will also fund a TCP treatment system. All wells with water quality violations will be properly abandoned according to Kern County Environmental Health regulations.

KRGSA-6 South Kern and Old River Mutual Water System Consolidation – Two small mutual water systems in the southern KRGSA will be consolidated into the City of Bakersfield's domestic water system for benefits to drinking water quality, including to

disadvantaged communities (DACs). The Project will include new water distribution systems connecting the mutual water systems with the City's water system, which will improve drinking water quality for the DAC.

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using

either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related

to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern

Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by KRGSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: Implemented, Functional, In-Process, or As-Needed.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA’s, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N**, the KRGSA has a Pre-SGMA net water budget deficit of –63,608 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the KRGSA is a "net-recharger" of water with a positive water budget in the amount of +30,184 AFY. KRGSA was able to eliminate their deficit during this period through demand reduction and increased recharge to support conjunctive use even though six of the nine years were below normal, dry, or critically dry.

For the entire water budget period between 1995-2023, [which includes four multiple-year drought periods – 2001-2004, 2007-2009, 2012-2016, and 2018-2022] the KRGSA has a net water budget deficit of –34,500 AFY. KRGSA has successfully reduced their deficit pre-SGMA through demand reduction and increased recharge. From 1995 to 2023, irrigated area has decreased by 25 percent and applied water on these lands have also decreased by 25 percent. Urban lands have increased in area by 41 percent but water demand was only increased by 6 percent. Overall, water demand in the KRGSA decreased by 17 percent. Projects and management actions to increase conjunctive use and recharge have been implemented and continue to maximize supplies during wet years for use during dry years. KRGSA has actively managed groundwater to reduce the deficit to reach a positive water budget post-SGMA.

It is important to note that the KRGSA currently banks water for out of basin users as well as banks their supply In Kern Fan Project. Currently KRGSA stores 144,103 AFY on behalf of users outside the basin but collectively banks 388,725 AFY in the basin but outside of the GSA area. Annualized, this represents a net of 12,231 AFY of additional water supply available to KRGSA outside of their GSA boundaries.

The P/MA combined portfolio represented herein is expected to continue the net average annual surplus of the post-SGMA period and avoid Undesirable Results by reducing demand and increasing supply within the KRGSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (KRGSA-1, KRGSA-2, KRGSA-3, KRGSA-7) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the FKC through the CVC. KRGSA is a fourth priority non-CVP SOD Contractor that can take CVP water under certain conditions. The Friant-Kern Canal capacity has been recently hampered by subsidence which has limited available supplies. Remediation efforts are underway and should restore access to these critical supplies by 2030.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. KRGSA currently receives SWP water through a water supply contract (Table 1 Entitlement 25,500 AF for KDWD and 82,946 AF for ID4) with KCWA, one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. ID4 is a SWP wholesaler and received.

The Henry C. Garnett Water Purification Plant (HCGWPP), owned and operated by ID4, primarily treats imported water for municipal use. SWP water is conveyed directly to the plant as needed. When excess SWP water is available, ID4 recharges it – both inside and outside of the KRGSA Plan Area – for subsequent recovery and treatment at the HCGWPP. ID4 also diverts Kern River water and CVP water to the plant through exchanges. Water from the HCGWPP is distributed to Cal Water, City of Bakersfield, ENCSD, and NORMWD.

Recycled Water

The City of Bakersfield treats municipal wastewater for a variety of reuses in the Plan Area. Tertiary treated wastewater is recycled to irrigate parkland and sports fields within the KRGSA Plan Area that would have otherwise used potable water. Recycled water use is projected to increase in the City. In addition to irrigation, de-nitrified secondary treated wastewater is used to recharge groundwater via unlined ponds (Stetson, 2017). Previous recycled water was exported from KRGSA but future projects are designed to maximize recycled water use within the KRGSA Plan Area.

Appropriative Water Rights

KRGSA agencies have a long history of conjunctive use in the Plan Area. Local surface water sources (primarily the Kern River) and imported water sources (mostly SWP) are managed for direct use and groundwater recharge. These actions serve to decrease reliance on groundwater and to replenish it for times when surface water supplies are limited. In this manner surface water and groundwater are managed conjunctively to optimize water supply for beneficial uses in the KRGSA Plan Area.

Almost all surface supplies available to the KRGSA are managed by the City of Bakersfield, ID4, and KDWD.

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

Distribution of water within the First Point service area of the Kern River was adjudicated in the 1900 Shaw Decree. Over the years, Kern River water has been apportioned based on entitlements determined through canal company consolidations, water rights transfers and acquisitions, court decisions, and agreements. In 1888, two permanent stream gage stations, First Point and Second Point, were established to measure flow in the Kern River on a real-time basis. The First Point daily discharge is used to allocate water among various Kern River interests, referred to as First Point diverters, Second Point diverters, and Lower River diverters. The Second Point of measurement is approximately 20 miles downstream and is used to check upstream water use (and entitlements) with diversion rights on the Lower River (Boyle, 1975). Second Point is shown on Figure 1-1 and marks the western edge of the KRGSA Plan Area.

KDWD and City of Bakersfield are successors-in-interest to all First Point water rights holders. Buena Vista Water Storage District (BVWSD) is successor-in-interest to all Second Point water right holders. KCWA is successor-in-interest to all Lower River water right holders (downstream of Second Point). The City monitors, manages, and records flows and diversions in the River on behalf of the Kern River Watermaster for all water users.

3rd Party Programs

KRGSA has long operated 3rd party banking program for several Kern County and outside of Kern County agencies. Over the past several years more interest has been expressed in participating in KRGSA projects for drought protection needs. These supplies come from the above three identified sources and have provided groundwater supply for KRGSA and drought protection for the 3rd party.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

The water supply benefit for water recharge and optimization projects have been estimated based on observed benefits. KRGSA-1 and KRGSA-2 have been implemented and the observed average annual increase in recharge to the KRGSA (2018-2023) is assumed to continue.

The estimated benefit from urban conservation was calculated by using revised future estimates of per capita demand published in the 2020 Urban Water Management Plans (UWMPs) to the previous estimates used to simulate future conditions. This estimate may be conservative as additional legislation may continue to decrease per capita demands.

The benefit of changes in the recycled water system is based on the current volume of recycled water that is currently exported from the KRGSA area. The project would increase recycled water within KRGSA and limit the export.

The benefit for agricultural land converted to urban is assumed to be 2.7 AFY/Ac, the expected ET demand of the crops taken out of projects. The expected urban demand expected on these parcels are already included in the future growth projections for the water retailers.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The KRGSA is comprised of Kern Delta Water District, City of Bakersfield, and Kern County Water Agency (ID4) and collectively possess the legal authority to implement P/MAs discussed herein. KRGSA is also a GSA, with the participation of Kern County, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR, and others.

Estimated costs for KRGSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Kern River GSA	Estimated Costs	
	One-time	Annual
Implemented	$7,000,000	$95,000
Functional		
In-Process	$7,525,000	$183,000
As-Needed		
Total	**$14,525,000**	**$278,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects

discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. The formation of a groundwater budget program would likely include mechanisms to allow for trading or exchange of pumping allocations within designated areas, subject to constraints dictated by groundwater conditions observed within the Monitoring Network and policies developed by the respective Board of Directors. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Kern Water Bank GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage "deficit" of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning documents, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

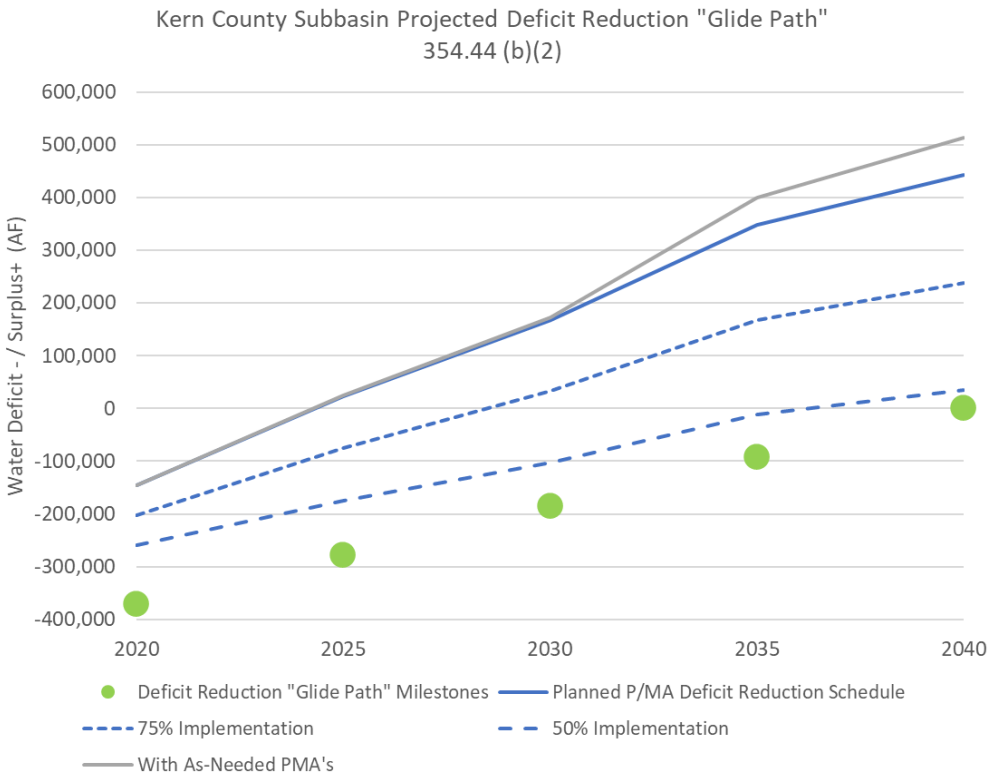


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

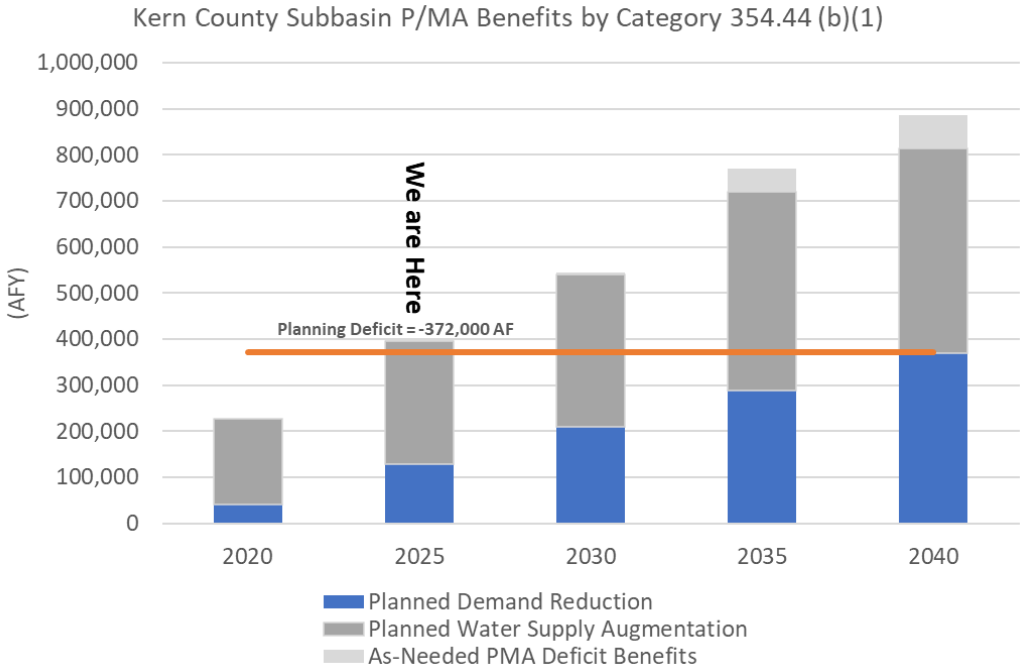


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Kern Water Bank GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County (i.e., by January 2040). The KWB GSA individual P/MAs have already been implemented and the results, also known as a "Glide Path," have been developed as summarized for KWB GSA Table 2 below and illustrated on Figure 3. As shown, this "Glide Path" is horizontal because the KWB GSA, due to operational constraints, cannot have a groundwater deficit. However, water stored in the KWB GSA can help KWBA members reduce their deficits.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Kern Water Bank GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction					
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**0**	**0**	**0**	**0**
Planned Water Supply Augmentation	Supplemental Water Recharge	21,762	21,762	21,762	21,762	21,762
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**21,762**	**21,762**	**21,762**	**21,762**	**21,762**
P/MA Implementation Schedule*		**21,762**	**21,762**	**21,762**	**21,762**	**21,762**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Implementation Deficit Reduction Schedule*		**21,762**	**21,762**	**21,762**	**21,762**	**21,762**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

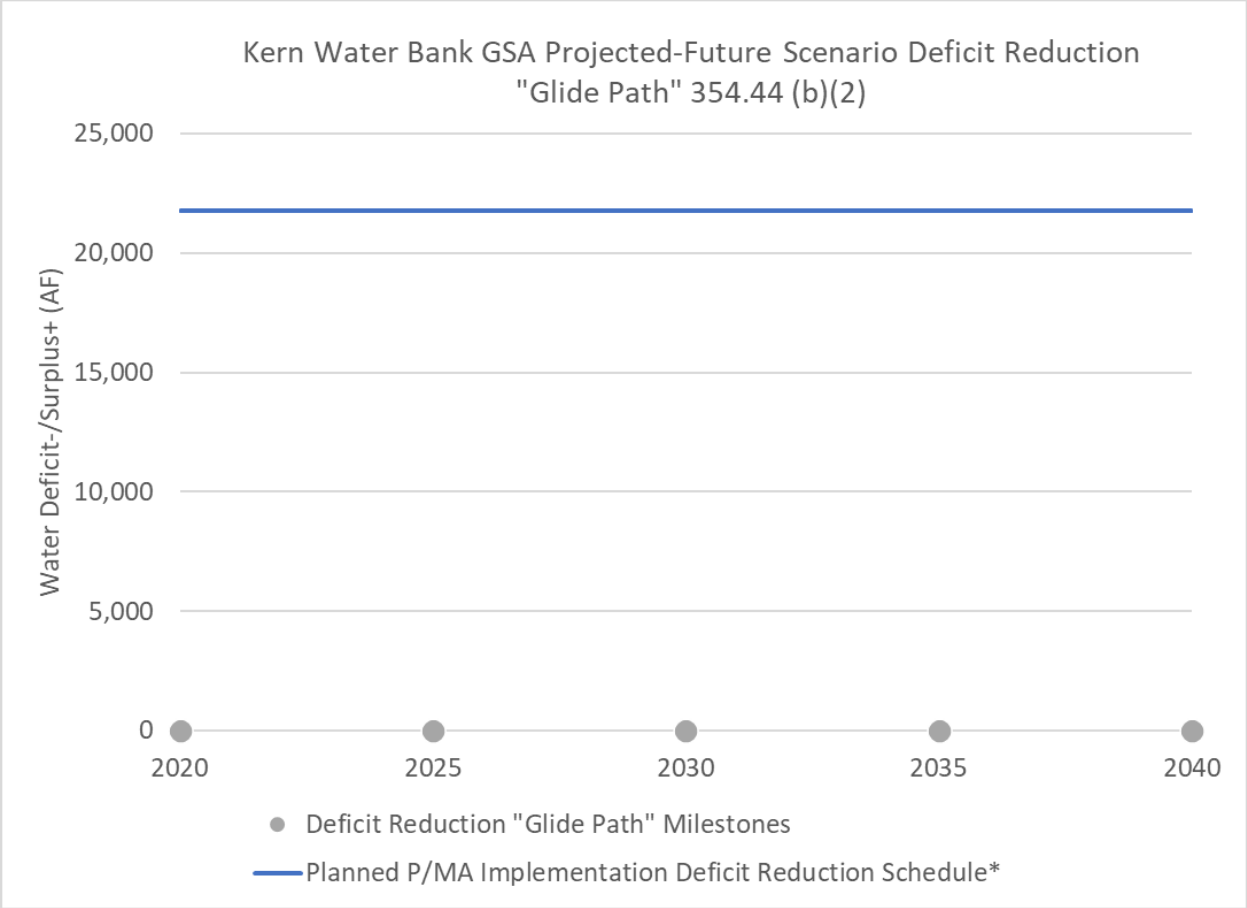


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example RRB-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional			In-Process			As-Needed					
KWBA-1	KWB Recharge and Recovery Enhancement Project	Construction of 3 wells and associated pipelines and 2 recharge basins (189 acres). Provides approx. 1730 AF/mo recharge capacity and 910 AF/mo recovery capacity.	✓			Supplemental Water Recharge	NA	Planned though IRWM Grant Process with basin stakeholders.	CEQA review completed with NOD in 1997.	**Implemented**	NA	Completed	2018-	**182**	**0**	✓	✓	✓			SWP Table A, SWP Article 21 , Kern River purchases and floodwater, Friant-Kern Section 215 purchases	None	$3,900,000	$1,000	IRWM Grant and KWBA Assessments
KWBA-2	KWB Recharge Enhancement Project	Construction of 4 pumping facilities on the Kern Water Bank Canal and 1025 acres of recharge basins. Capture of up to 107,900 AF/yr of wet period water.	✓			Supplemental Water Recharge	NA	Planned though IRWM Grant Process with basin stakeholders.	KWBA Addendum No. 1 to the 2016 Monterey Plus Revised EIR	**Implemented**	NA	Completed	2020-	**21,580**	**0**	✓	✓	✓			SWP Table A, SWP Article 21 , Kern River purchases and floodwater, Friant-Kern Section 215 purchases	None	$11,500,000	$3,000	IRWM Grant and KWBA Assessments
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	KWBA Assessments

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional			In-Process			As-Needed					
KWBA-3	Project Recovery Operations Plan	Domestic, small community, and irrigation well mitigation program to address impacts related to temporary lowering of water levels during prolonged droughts on adjacent lands.	✓				NA	Project websites, mailers, local well companies, newspaper articles.	NA	**Implemented**	NA	Complete	2010-	**0**	**0**	✓	✓	✓			NA	NA	$0	$35,000	KWBA Assessments
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	KWBA Assessments

KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	KWBA Assessments
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	KWBA Assessments
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	KWBA Assessments
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	KWBA Assessments
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	KWBA Assessments
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	KWBA Assessments
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

- Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" for the Subbasin that will result in closing the currently identified "deficit" of 372,000 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of Implementation of a "Glide Path" for the Subbasin that will result in closing the balance of the currently identified "deficit" of 372,000 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA Specific Projects that have been implemented by the KWB GSA that contribute to water supply augmentation include:

KWBA-1 Kern Water Bank Recharge and Recovery Enhancement Project – This project included the construction of 3 wells and associated pipelines and 2 recharge basins (189 acres). This project provides approximately 1730 AF/month recharge capacity and 910 AF/month recovery capacity.

KWBA-2 Kern Water Bank Recharge Enhancement Project – This project included the construction of 4 pumping facilities on the Kern Water Bank Canal and 1,025 acres of recharge basins. The project will capture of up to 107,900 AF/yr of wet period water.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to

established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KWBA-3 Project Recovery Operations Plan – This is a domestic, small community, and irrigation well mitigation program to address impacts related to a temporary lowering of water levels resulting from KWB recovery operations during prolonged droughts on adjacent lands. This management action includes public outreach, emergency water supplies, and mitigation measures that have included replacement wells, pump replacement and/or lowering, and connection to urban purveyors. The triggers for mitigation are very favorable to the well owners – as little as a 10% contribution to overall lowered water levels will result in the provision of mitigation.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.

b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of

services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the

Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by KWB GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the Kern Subbasin projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA and Subbasin may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 1 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different Subbasin P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

The KWB GSA can only recover previously stored surface water and due to these operational constraints, it will never have a water budget deficit.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. The KWB GSA specific projects, already implemented, involve increased

surface water storage. These benefits will be quantified by direct measurements and the benefits will be measurable and certain. For those Subbasin-wide P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the Subbasin P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Water supplies that increase water storage P/MAs (KWBA-1 and KWBA-2) are secured by our members. These supplies typically come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be purchased by KWBA members and delivered from the Friant-Kern Canal through the CVC and Kern River channel to KWB GSA facilities. The Friant-Kern Canal capacity has been recently hampered by subsidence which has limited available supplies. Remediation efforts are underway and should restore access to these critical supplies by 2030.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. KWB GSA members

currently receive SWP water through water supply contracts with Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased and stored for future use. KWB GSA members may purchase excess Article 21 water through the KCWA.

Kern River

Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion when water (1) is offered to all takers willing to sign a Notice/Order; or (2) is offered to the Kern River/California Aqueduct Intertie for disposal; or (3) is expected to flood farm acreage; or (4) is expected to be delivered into the Kern River Flood Channel for disposal out-of-county. The KWBA secured a 180-day Permit from the SWRCB to take such water in 2023. KWB GSA members may also purchase Kern River water from rights holders.

3rd Party Programs

The KWB GSA does provide for second priority use. However, access to facilities is typically very limited due to the KWBA members' needs.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Water supply augmentation benefits for projects KWBA-1 and KWBA-2 were determined by an independent engineering evaluation incorporated into state grant proposal submittals.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The KWB GSA is a joint powers authority that possesses the legal authority to implement all GSA powers described in California Water Code (CWC) § 10725 through 10726.8.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility

studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- KWB GSA participant assessments, and/or
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for KWB GSA P/MA's by implementation status are summarized in Table 4. The costs for KWBA-1 and KWBA-2 are based on actual expenditures. These costs include "one-time" costs and ongoing costs. The one-time and on-going costs for the Subbasin P/MAs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, maintenance, or any other costs required to initiate and sustain a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Kern Water Bank GSA	Estimated Costs	
	One-time	Annual
Implemented	$15,400,000	$134,000
Functional		
In-Process	$25,000	$60,000
As-Needed		
Total	**$15,425,000**	**$194,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which Subbasin deficits will be addressed is through implementing P/MAs that reduce demand (*e.g.*, KSB-6) and augment supplies from additional outside sources of water, particularly during normal to wet years. The two KWB GSA specific projects (KWBA-1 and KWBA-2) take advantage of additional wet-year supplies that have already proven to be available. The KWB GSA portfolio also includes policy-based management actions aimed at demand reduction in white lands (KSB-6). The KWB GSAs' operational constraints and P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in surface water

storage during drought will be offset by increases in groundwater levels and surface water storage during other periods.

North Kern Water Storage District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

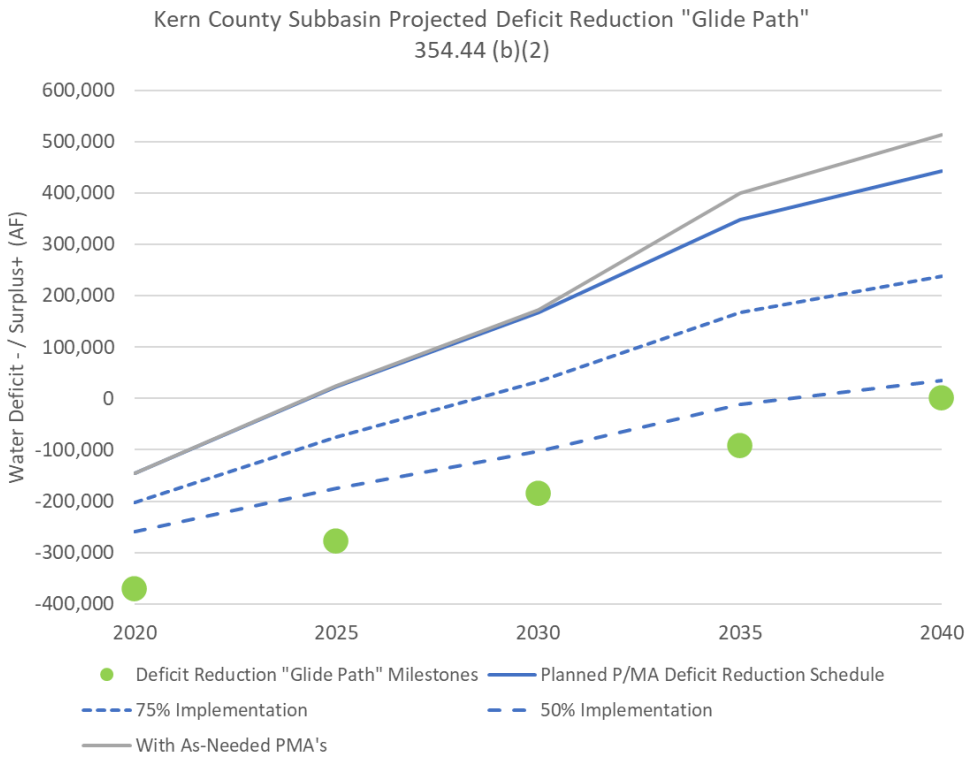


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

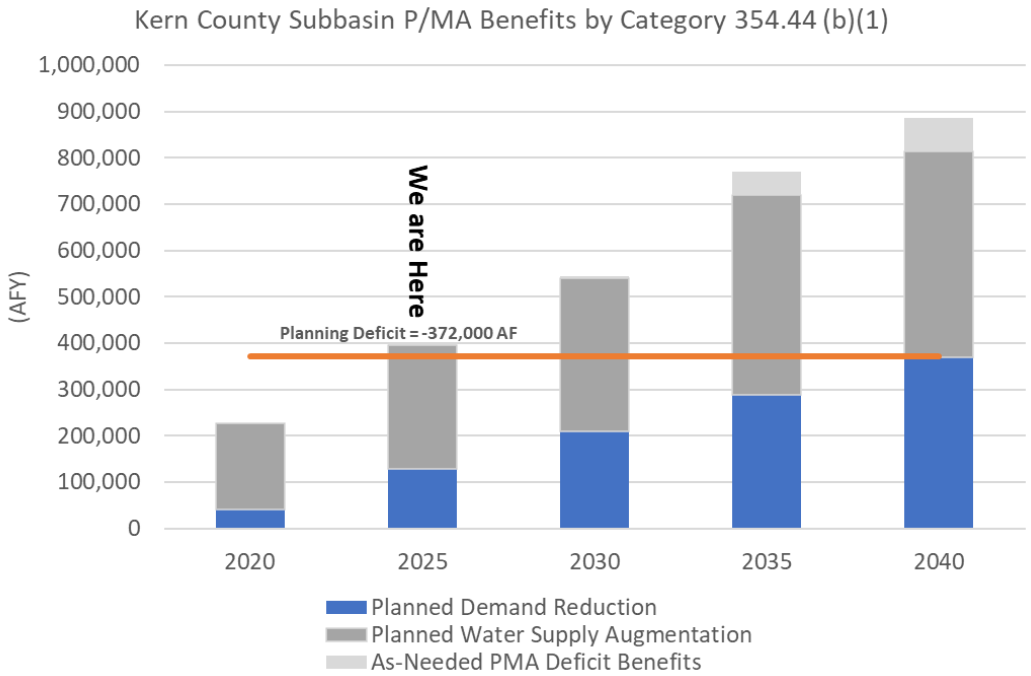


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – North Kern Water Storage District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for the North Kern Water Storage District GSA (NKWSD GSA) in Table 2 below and illustrated on Figure 3 The "Glide Path" is aimed to address 25 percent of the projected deficit of during each five-year Milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSP Area. NKWSD GSA has no projected deficit, as indicated in Table 2, so the projected deficit at each five-year milestone is zero AF. The anticipated P/MA implementation schedule is forecasted to have exceeded the target deficit reduction as early as 2020. Please note that the last row of Table 2 shows an increasing volume of surplus water resulting from NKWSD GSA P/MA implementation. As NKWSD GSA does not have a historical deficit, P/MA demand reduction and supply augmentation will provide resilience in the event of drier conditions or other unforeseen changes to the GSA's water balance.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
North Kern Water Storage District GSA Projected-Future Scenerio Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction		1,620	11,220	11,220	11,220
	Ag to Urban Conversion					
	Water Conservation-Efficiency		3,400	3,400	3,400	3,400
	Subtotal	**0**	**5,020**	**14,620**	**14,620**	**14,620**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use	2,500	9,000	9,000	9,000	9,000
	Third-Party Banking		9,000	9,000	9,000	9,000
	New Local Supply					
	Exercise of Rights					
	Subtotal	**2,500**	**18,000**	**18,000**	**18,000**	**18,000**
P/MA Implementation Schedule*		**2,500**	**23,020**	**32,620**	**32,620**	**32,620**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**2,500**	**23,020**	**32,620**	**32,620**	**32,620**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

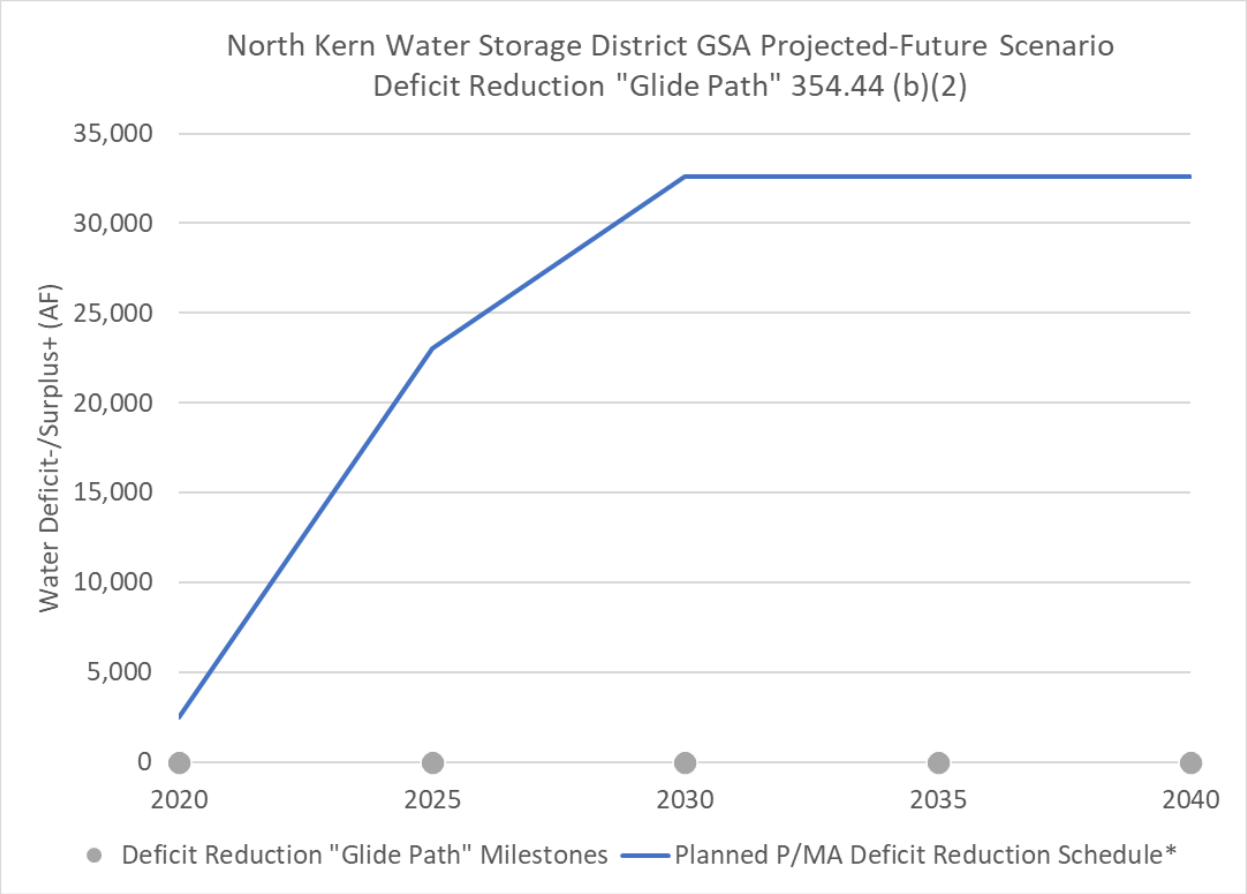


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example NKWSD-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed					
NKWSD-1	Beneficial Reuse of Oilfield Produced Water	Oilfield produced water of sufficient quality for beneficial reuse used as source water for groundwater recharge. 9,000 AFY expected annually, 6,500 of which will be transferred to RRID.	✓		✓	New Local Supply	Already being implemented	NKWSD, Board Meetings & Website	Waste Discharge Requirement Permit	**Ongoing**	2014	2016	2014-	**2,500**	**0**			✓			Oilfield Produced Water	District / SGMA authorities	$300,000	$1,000,000	Water Tolls/ District
NKWSD-2	Allocation of Available NKWSD Supplies to RRID	Transfer a portion of groundwater banked oilfield produced water from NKWSD to RRID benefit.	✓			New Local Supply	Already being implemented	NKWSD, Board Meetings & Website	None	**Ongoing**	2020	2023	2023-	**6,500**	**0**			✓			Oilfield Produced Water	District / SGMA authorities	$0	$650,000	RRID/Landowners
NKWSD-3	Landowner Subsurface/Surface Recharge Program	Implementation of joint Landowner and District program to expand District groundwater recharge using landowner owned facilities.	✓	✓		Supplemental Water Recharge	Already being implemented	NKWSD, Board Meetings & Website	CEQA	**Ongoing**	2020	2024	2024-	**1,000**	**320**	✓		✓			Utilize Existing Water Right/ Landowner Acquisition	District / SGMA authorities	$1,400,000	$90,000	District/Landowners
NKWSD-4	SCADA Automation and Evapotranspiration Measurement Improvements	Develop automation and remote sensing for ET monitoring and improved management of surface water conveyance.	✓			Water Conservation-Efficiency	Already being implemented	NKWSD, Board Meetings & Website	CEQA, NEPA	**Ongoing**	2020	2024	2021-	**0**	**3,400**			✓		✓	Demand Reduction	District / SGMA authorities	$160,432	$10,000	Grant/ District assessments and/or water tolls
NKWSD-5	Calloway Canal Improvements: Lining Snow Rd. to 7th Standard Rd.	Concrete lining of canal to increase surface water reliability and prevent loss from seepage.	✓	✓	✓	Water Conservation-Efficiency	Already being implemented	NKWSD, Board Meetings & Website	CEQA, NEPA	**Ongoing**	2019	2024	2025-	**0**	**0**	✓		✓			Utilize Existing Water Right	District / SGMA authorities	$6,506,700	$5,000	Grant/ District assessments and/or water tolls
NKWSD-6	Calloway Canal Improvements: lining 7th Standard Rd. to 8-1 Pump Station	Concrete lining of canal to increase surface water reliability and prevent loss from seepage.	✓	✓	✓	Water Conservation-Efficiency	Already being implemented	NKWSD, Board Meetings & Website	CEQA, NEPA	**Initiated**	2020	2026	2026-	**0**	**0**	✓		✓			Utilize Existing Water Right	District / SGMA authorities	$10,061,000	$5,000	Grant/ District assessments and/or water tolls
NKWSD-7	Groundwater Banking Conveyance Improvements to NKWSD Recharge and Recovery	Improvements to existing well network for return capacity of recharged water to District's banking partners.	✓	✓	✓	Third Party Banking	Already being implemented	NKWSD, Board Meetings & Website	CEQA, NEPA	**Initiated**	2019	2026	2025-	**4,000**	**0**	✓	✓	✓			Third Party Banking Partner Sources	District / SGMA authorities	$15,350,000	$950,000	Grant/ District assessments and/or water tolls
NKWSD-8	Calloway Canal Improvements: lining Fruitvale Ave. to CVC Intertie	Concrete lining of canal to increase surface water reliability and prevent loss from seepage.	✓	✓	✓	Water Conservation-Efficiency	Already being implemented	NKWSD, Board Meetings & Website	CEQA, NEPA	**Initiated**	2022	2028	2027-	**0**	**0**	✓		✓			Utilize Existing Water Right	District / SGMA authorities	$6,509,000	$5,000	Grant/ District assessments and/or water tolls
NKWSD-9	Calloway Canal Improvements: lining Case St. to Fruitvale Ave.	Concrete lining of canal to increase surface water reliability and prevent loss from seepage.	✓	✓	✓	Water Conservation-Efficiency	Already being implemented	NKWSD, Board Meetings & Website	CEQA, NEPA	**Initiated**	2022	2029	2028-	**0**	**0**	✓		✓			Utilize Existing Water Right	District / SGMA authorities	$8,404,360	$5,000	Grant/ District assessments and/or water tolls
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	District assessments and/or water tolls

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary										
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring				One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed						
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	Grant/ District assessments and/or water tolls
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	District assessments and/or water tolls
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	Grant/ District assessments and/or water tolls
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	Grant/ District assessments and/or water tolls
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	District assessments and/or water tolls
NKWSD-10	**RRID Groundwater Recharge Project**	Construction and Implementation of water recharge basins for the RRID management area. Approximately 450 acres of crops will be removed and replace by recharge facilities.	✓	✓		Demand Reduction, Supplemental Water Recharge	Already being implemented	NKWSD, Board Meetings & Website	CEQA	**Initiated**	2023	2036	2025-	**7,200**	**1,300**	✓	✓	✓			Utilize Existing Contracts, Agreements, and Surplus Acquisition	District / SGMA authorities	$18,000,000	$400,000	Grant/RRID
NKWSD-11	**Expanded Water Banking Program**	Use of available capacity in existing facilities and development of additional recharge and recovery facilities	✓	✓	✓	Third Party Banking	Already being implemented	NKWSD, Board Meetings & Website	CEQA	**Initiated**	2020	TBD	2025-	**5,000**	**0**	✓	✓	✓			Third Party Banking Partner Sources	District / SGMA authorities	TBD	TBD	Grant/ District assessments and/or water tolls
NKWSD-12	**Poso Creek Weir**	Installation of a concrete weir on Poso Creek to replace the earthen structure.	✓		✓	Water Conservation-Efficiency	Upon adoption of this project	NKWSD, Board Meetings & Website	CEQA, CDFW	**Conceptual**	2025	TBD	2026-	**TBD**	**0**		✓	✓		✓	Poso Creek	District / SGMA authorities	TBD	TBD	Grant/ District assessments and/or water tolls

KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	District assessments and/or water tolls
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	District assessments and/or water tolls
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
NKWSD-13	**Ongoing Evaluation of Groundwater Levels and Water Quality Trends**	Monitor WQ to determine if a correlation for degradation develops as a result of declining water levels.	✓	✓			Already being implemented	NKWSD, Board Meetings & Website	None	**Ongoing**	2015	TBD	Ongoing	**0**	**0**	✓				✓	Monitoring	District / SGMA authorities	$0	$75,000	District assessments and/or water tolls
NKWSD-14	**Refinement of Water Budget Components**	Improvement of monitoring and measurements to refine the accuracy of measurement or calculation of inflow and outflow components of district-level water budget. Will also refine Subbasin Model and water budget.	✓	✓	✓		Already being implemented	NKWSD, Board/GSA Meetings & Website	None	**Initiated**	2020	TBD	2030-	**0**	**0**			✓		✓	Data Improvement	District / SGMA authorities	$0	$15,000	Grant/ District assessments and/or water tolls
NKWSD-15	**Conversion of Agricultural Land to Urban Use in RRID**	Conversion of agricultural land to urban use within the limits of each city to reduce groundwater use due to the decreased demand.	✓	✓		Demand Reduction	Already being implemented	Land Use & Planning	District, City & County	**Initiated**	2015	TBD	2030-	**0**	**9,600**			✓			Demand Reduction	District / SGMA authorities	$0	$22,500	Landowners, Cities & Private
NKWSD-16	**Urban Water Conservation Program**	Implementation of urban indoor and outdoor usage cappage as required by SB 606 and AB 1668.	✓			Demand Reduction	Already being implemented	Urban Water Supplier & District	State Regulations, Local Ordinance	**Ongoing**	2020	TBD	2030-	**0**	**TBD**	✓		✓			Demand Reduction	Cities	$0	$10,000	Grants/City/District
NKWSD-17	**In-District Allocation Structure**	Implementation of an groundwater credit allocation structure that would allow for the transfer of groundwater pumping credits within the district's jurisdiction.	✓	✓		Water Use Efficiency	As Needed	NKWSD, Board Meetings & Website	None	**Conceptual**	TBD	TBD	TBD	**TBD**	**0**			✓			Utilize Existing Water Storage	District / SGMA authorities	TBD	TBD	Grant/ District assessments and/or water tolls
NKWSD-18	**Voluntary Land Fallowing**	Development and implementation of a voluntary land fallowing program to reduce water demand.	✓	✓	✓	Demand Reduction	As Needed	NKWSD, Board Meetings & Website	None	**Conceptual**	TBD	TBD	TBD	**0**	**TBD**			✓			Demand Reduction	District / SGMA authorities	TBD	TBD	Grant/ District assessments and/or water tolls
NKWSD-19	**Pumping Restrictions**	Implement groundwater pumping allocations or limits.	✓	✓	✓	Demand Reduction	As Needed	NKWSD & GSA Board Meetings, Website, Direct Notices	Local Ordinance	**Conceptual**	TBD	TBD	TBD	**0**	**TBD**			✓	✓		Demand Reduction	District / SGMA authorities	TBD	TBD	District assessments and/or water tolls
NKWSD-20	**In-Lieu Recharge Program**	Implementation of fees for groundwater use when surface water is available.	✓	✓	✓	Water Conservation-Efficiency	As Needed	NKWSD, Board Meetings & Website	Prop 218	**Conceptual**	TBD	TBD	2035-	**0**	**TBD**	✓	✓	✓			Demand Reduction	District / SGMA authorities	None	None	None
NKWSD-21	**On-Farm Efficiency/Deficit Irrigation Practices Incentive Program**	Improvements to individual farming operations that address water use efficiency and/or groundwater protection through incentive programs.	✓	✓	✓	Water Conservation-Efficiency	As Needed	NKWSD, Board Meetings & Website	None	**Conceptual**	TBD	TBD	2035-	**TBD**	**TBD**	✓		✓			Demand Reduction - Water Use Efficiency	District / SGMA authorities	TBD	TBD	Grant/ District assessments and/or water tolls

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the currently identified “deficit” of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs that have either been implemented or are currently being implemented or in-process and contribute to water demand reduction include:

NKWSD-3 Landowner Subsurface/Surface Recharge Program = Implementation of joint Landowner and District program to expand District groundwater recharge using landowner owned facilities.

NKWSD-4 SCADA Automation and Evapotranspiration Measurement Improvements = Develop automation and remote sensing for ET monitoring and improved management of surface water conveyance."

NKWSD-10 RRID Groundwater Recharge Project = Construction and Implementation of water recharge basins for the RRID management area. Approximately 450 acres of crops will be removed and replaced by recharge facilities.

NKWSD-15 Conversion of Agricultural Land to Urban Use in RRID = Conversion of agricultural land to urban use within the limits of each city to reduce groundwater use due to the decreased demand.

NKWSD-16 Urban Water Conservation Program = Implementation of urban indoor and outdoor usage cap as required by SB 606 and AB 1668.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land’s relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin’s ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" by 0 AFY by the January 2040 GSP implementation deadline.

GSA-specific P/MAs that have either been implemented or are currently being implemented or in-process and contribute to water supply augmentation include:

NKWSD-1 Beneficial Reuse of Oilfield Produced Water = Oilfield produced water of sufficient quality for beneficial reuse used as source water for groundwater recharge. 9,000 AFY expected annually, 6,500 of which will be transferred to RRID.

NKWSD-2 Allocation of Available NKWSD Supplies to RRID = Transfer a portion of groundwater banked oilfield produced water from NKWSD to RRID benefit.

NKWSD-3 Landowner Subsurface/Surface Recharge Program = Implementation of joint Landowner and District program to expand District groundwater recharge using landowner owned facilities.

NKWSD-5 Calloway Canal Improvements: Lining Snow Rd. to 7th Standard Rd. = Concrete lining of canal to increase surface water reliability and prevent loss from seepage.

NKWSD-6 Calloway Canal Improvements: lining 7th Standard Rd. to 8-1 Pump Station = Concrete lining of canal to increase surface water reliability and prevent loss from seepage.

NKWSD-7 Groundwater Banking Conveyance Improvements to NKWSD Recharge and Recovery = Improvements to existing well network for return capacity of recharged water to District's banking partners.

NKWSD-8 Calloway Canal Improvements: lining Fruitvale Ave. to CVC Intertie = Concrete lining of canal to increase surface water reliability and prevent loss from seepage.

NKWSD-9 Calloway Canal Improvements: lining Case St. to Fruitvale Ave. = Concrete lining of canal to increase surface water reliability and prevent loss from seepage.

NKWSD-10 RRID Groundwater Recharge Project = Construction and Implementation of water recharge basins for the RRID management area. Approximately 450 acres of crops will be removed and replaced by recharge facilities.

NKWSD-11 Expanded Water Banking Program = Use of available capacity in existing facilities and development of additional recharge and recovery facilities.

NKWSD-12 Poso Creek Weir = Installation of a concrete weir on Poso Creek to replace the earthen structure.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

NKWSD-13 Ongoing Evaluation of Groundwater Levels and Water Quality Trends = Monitor WQ to determine if a correlation for degradation develops as a result of declining water levels.

NKWSD-14 Refinement of Water Budget Components = Improvement of monitoring and measurements to refine the accuracy of measurement or calculation of inflow and outflow components of district-level water budget. Will also refine Subbasin Model and water budget.

KSB-1 Friant-Kern Canal Capacity Mitigation - The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that “any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results.” Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA’s position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.

d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by NKWSD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in

Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed.**

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example,

imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9** ***Water Budget Information*** *and* ***Appendix N***, the NKWSD GSA has a Pre-SGMA net positive water budget of 28,961 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out banked water in storage for other parties and includes groundwater transfers from other GSA's areas. The Post-SGMA period between 2015-2023 indicates the NKWSD GSA is in a net water budget deficit of -5,763 AFY when the banked water balances for other parties are netted out over the same period, but artificially removes the full banked water obligation balances over the 9-year period. In this period, supply was sufficient to meet demand but NKWSD maintained banking recovery obligations.

Over the full 1995-2023 period the NKWSD GSA is a net-recharger of water to the subbasin under all the modeled scenarios, with a positive net water budget of 18,184 AFY. The P/MA combined portfolio represented herein is not necessary to maintain current groundwater sustainability, as indicated in **Section 9**, but have been planned to protect and maintain future sustainability from potentially variable water supplies and demand, and to avoid Undesirable Results caused by NKWSD GSA groundwater management activities.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 141 *P/MA-3***.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2**.**

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit will be

quantified directly through flow measurement. For P/MAs that involve indirect supply augmentation through increased groundwater storage or banking, quantification of the benefit will require tracking of project water deliveries and estimates of indirect supply increases based on specific project conditions. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against the recent historical and projected condition without the P/MA in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies for water supply augmentation P/MAs (NKWSD-1, NKWSD-2, NKWSD-3, NKWSD-7, NKWSD-10, and NKWSD-11) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the Friant-Kern Canal through the CVC. NKWSD is a fourth priority non-CVP SOD Contractor that can take CVP water under certain conditions. The Friant-Kern Canal capacity has been recently hampered by subsidence which has limited available supplies. Remediation efforts are underway and should restore access to these critical supplies by 2030. NKWSD implements groundwater banking programs and will expand those programs with CVP Contractors and therefore receives supplies via the Friant-Kern Canal.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by NKWSD and include Kern River and Poso Creek water rights. Other than NKWSD's pre-1914 Kern River rights, these water rights can be transferred to other parties as

long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

NKWSD is a Kern River water rights holder with the right to divert Kern River water for agricultural benefits and groundwater storage. NKWSD can also access additional Kern River water when it is available for groundwater recharge through other Kern River water contracts or agreements with other Kern River water right holders. Kern River "release" or "flood" water is also available to NKWSD when water (1) is offered to all takers willing to sign a Notice/Order; or (2) is offered to the Kern River/California Aqueduct Intertie; or (3) is expected to flood farm acreage; or (4) is expected to be delivered into the Kern River Flood Channel for flow out-of-county. NKWSD also takes this released water from the Kern River for groundwater recharge if and when available. Additionally, NKWSD has an active permit to divert flows from Poso Creek and can take additional flows under flood conditions.

Oilfield Produced Water

NKWSD has an active partnership with a local oil and gas company that produces good quality water as part of their process. This oilfield produced water is treated for non-potable uses and received by NKWSD for agricultural irrigation under an existing Waste Discharge Permit.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The NKWSD is a water storage district, that possesses the legal authority to implement P/MAs discussed herein. NKWSD GSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to

otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- Existing NKWSD resources.
- NKWSD landowner financial sponsorship.
- Financial sponsorship from private stakeholders, cities, and Kern County.
- Project partners, specifically the Rosedale Ranch Irrigation District (RRID).
- NKWSD assessments and/or water tolls.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for NKWSD GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

North Kern Water Storage District GSA	Estimated Costs	
	One-time	Annual
Implemented	$1,860,432	$1,845,000
Functional		
In-Process	$64,856,060	$1,552,500
As-Needed		
Total	**$66,716,492**	**$3,397,500**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which future potential deficits and total Subbasin deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs

include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

The formation of a potential groundwater budget program would likely include mechanisms to allow for trading or exchange of pumping allocations within designated areas, subject to constraints dictated by groundwater conditions observed within the Monitoring Network and policies developed by the respective Board of Directors.

Olcese Water District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

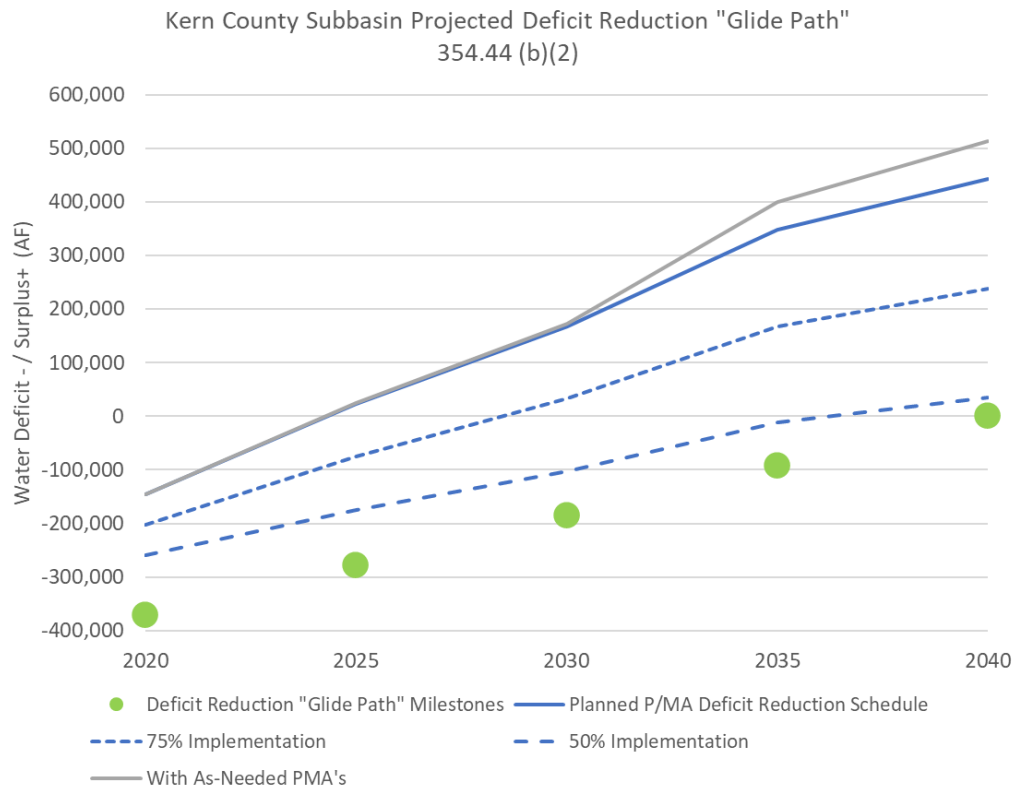


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

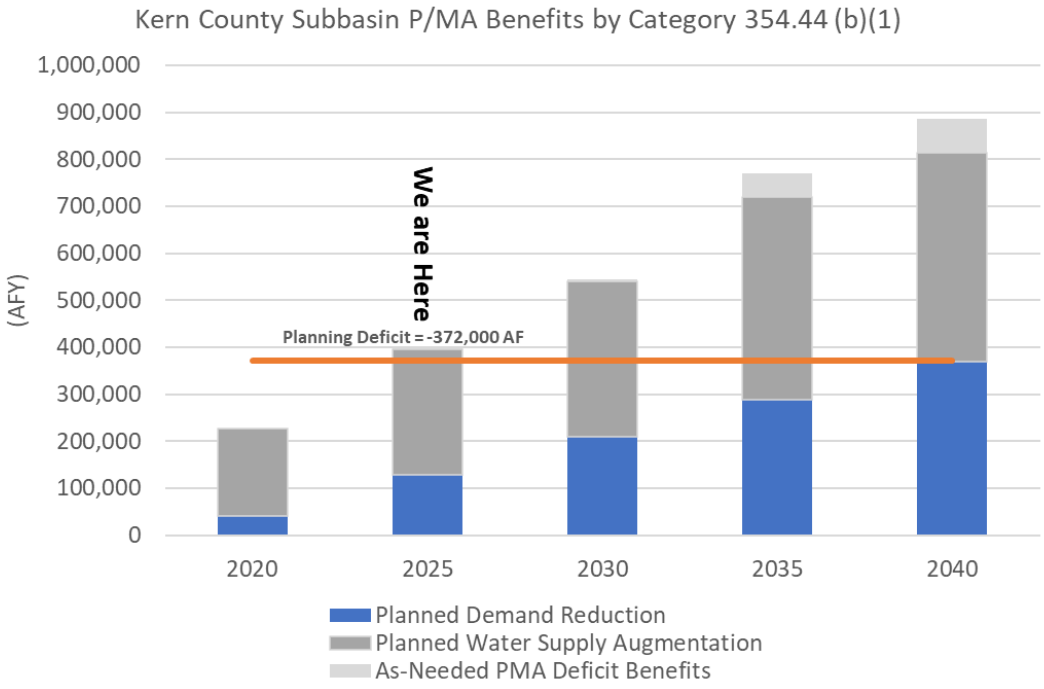


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Olcese Water District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Olcese Water District GSA in Table 2 below and illustrated on Figure 3. (Based on the checkbook approach, the Olcese GSA has a historical deficit of 181 AFY and a projected deficit with climate change of 176 AFY; however, the long-term stability of groundwater levels in the Olcese Water District's production wells, which are screened in the Olcese Aquifer, suggests that this checkbook deficit is overestimated, likely due to the unique hydrogeologic conditions of the Olcese Principal Aquifer screened by these wells. As such, due to the lack of any indication of historical chronic groundwater level declines or other undesirable results, the Olcese GSA has not established specific P/MAs targeted at reducing a deficit). A generic "Glide Path" is aimed to address 25 percent of the projected deficit during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Olcese Water District GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-180			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-45**	**-90**	**-135**	**-180**
Deficit Reduction "Glide Path" Milestones		**-180**	**-135**	**-90**	**-45**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction					
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**0**	**0**	**0**	**0**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**0**	**0**	**0**	**0**	**0**
P/MA Implementation Schedule*		**0**	**0**	**0**	**0**	**0**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**-180**	**-180**	**-180**	**-180**	**-180**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

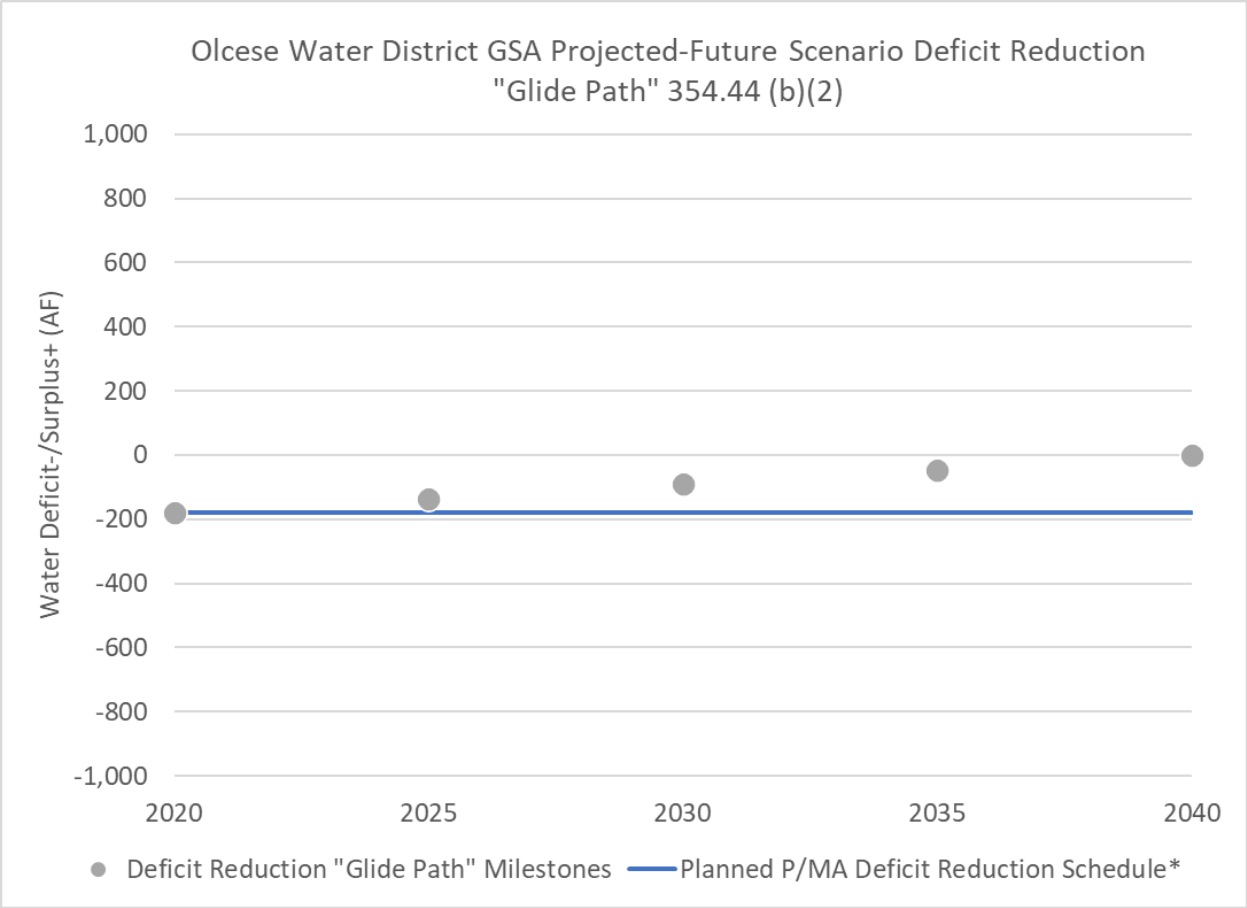


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example Olcese-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process			As-Needed								Implemented		Functional			In-Process		As-Needed					
Olcese-1	**Shallow Monitoring Well Installation**	Installation of a shallow monitoring well in the vicinity of Olcese Water District Well #2 for purposes of evaluating potential hydraulic connection between the Olcese Sand Aquifer Unit and the Shallow Alluvium.	✓	✓			Complete	NA	County well permit	**Implemented**	Complete	Complete	2019-	**0**	**0**					✓	NA	None	$40,000	$2,500	OWD
Olcese-2	**Second Shallow Monitoring Well Installation**	Installation of a second shallow monitoring well in the vicinity of Cottonwood Creek and conduct regular monitoring.	✓	✓			As-needed, contingent upon results of Project Olcese-1	NA	County well permit	**Conceptual Design**	As-needed	2-3 years	2-3 years	**0**	**0**					✓	NA	None	$40,000	$2,500	OWD

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process			As-Needed								Implemented		Functional			In-Process		As-Needed					
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	NA	$0	$25,000	OWD
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	OWD
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	OWD

Olcese-4	**Olcese Sand / Shallow Alluvium Hydraulic Connection Study**	Conduct a study of the potential hydraulic connection between the Olcese Sand Aquifer Unit and the Shallow Alluvium	✓	✓	✓		Installation of shallow monitoring well	NA	None	**In Progress**	Current	3 years	2025-	**0**	**0**					✓	NA	none	$50,000	$5,000	OWD
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	OWD
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	OWD
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	OWD
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	OWD
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will could support addressing a “deficit” under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline. Although the checkbook approach indicates a historical and projected deficit of approximately 180 AFY in the Olcese Water District GSA, this estimate is not supported by evidence of a chronic decline in groundwater levels in the Olcese Principal Aquifer from which groundwater is extracted and is likely overestimated due to the unique hydrogeologic conditions within the Olcese GSA area.

GSA-specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land’s relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin’s ability to meet its sustainability goal.

Water Supply Augmentation P/MA’s

Water Supply Augmentation P/MAs are the secondary means of Implementation of a “Glide Path” that could support addressing a “deficit” under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

As stated above, although the checkbook approach indicates a historical and projected deficit of approximately 180 AFY in the Olcese Water District GSA, this estimate is not supported by evidence of a chronic decline in groundwater levels in the Olcese Principal Aquifer from which groundwater is extracted and is likely overestimated due to the unique hydrogeologic conditions within the Olcese GSA area. Therefore, no GSA-specific water supply augmentation projects are planned.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

Olcese-1 Shallow Monitoring Well Installation – The Olcese Water District GSA completed the installation of a shallow monitoring well in the vicinity of Olcese Water District Well #2 for purposes of monitoring groundwater levels in the Shallow Alluvium aquifer to support evaluation of the potential hydraulic connection between the Olcese Sand Aquifer Unit and the Shallow Alluvium.

Olcese-2 Second Shallow Monitoring Well Installation – The Olcese Water District GSA may install a second shallow monitoring well in the vicinity of Cottonwood Creek and conduct monitoring, contingent upon results from P/MA Oclese-1 and Olcese PMA-4.

Olcese-4 Olcese Sand / Shallow Alluvium Hydraulic Connection Study – Following the installation of the shallow monitoring well under P/MA Olcese-1, the Olcese Water District GSA began conducting a study of the potential hydraulic connection between the Olcese Sand Aquifer Unit and the Shallow Alluvium. Data collection is ongoing.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.

d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

Olcese GSA does not have any existing domestic wells within its area, and so while it is a participant in the basin-wide Domestic Well Mitigation P/MA it is not expected to be relevant within the Olcese GSA.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or Landy for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the

Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by Olcese Water District GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. While not applicable to the Olcese Water District GSA P/MAs which do not have water supply expected benefits, in general if either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

One project and management action has been identified and listed "As Needed" on Table 3. This P/MAs focus on data gap filling and therefore will not result in any demand reduction.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N** the Olcese Water District GSA has a Pre-SGMA estimated net water budget deficit of 181 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. For the Post-SGMA period between 2015-2023, the Olcese Water District GSA has a smaller estimated deficit of about 105 AFY. It is important to note that the groundwater extraction within the Olcese Water District GSA is exclusively from the Olcese Principal Aquifer which underlies the area at significant depth and is hydraulic separated from the Kern Subbasin's Alluvial Principal Aquifer by a thick low permeability unit called the Round Mountain Silt. The Olcese Principal Aquifer is recharged by a combination of precipitation and surface

water infiltration from areas both within and outside of the Kern Subbasin. As such, the native yield attributed to the Olcese GSA area in the estimated water budget is likely an underestimate for this area. Despite the small estimated net historical deficit, groundwater levels in wells screened in the Olcese GSA area have generally exhibited long-term stability with no chronic decline or associated Undesirable Results. The Olcese Water District obtains the majority of its water supplies used for agricultural beneficial use from surface water for which it has robust riparian and non-riparian/appropriative water rights. The conditions of hydraulic separation of the Olcese Principal Aquifer from the Alluvial Principal Aquifer, the long-term groundwater level and storage stability, the use of robust and reliable surface water supplies, and the lack of Undesirable Results during the historical period, are expected to continue in the post-SGMA period and avoid Undesirable Results within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the water supply augmentation and demand reduction P/MAs described herein (none of which are applicable to the Olcese Water District GSA) are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation

are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

The Olcese Water District GSA P/MA's expected benefits are related to data gap filling; specifically, the expected benefits of the Olcese-1 (Implemented) and Olcese-4 (In-Process) P/MAs are improved understanding of hydrologic conditions in the Shallow Alluvium aquifer and its potential connection to the deeper Olcese Principal Aquifer. Evaluation of benefits of the Olcese Water District GSA P/MAs will be based on the degree to which Olcese-4 hydraulic connection study yields improved understanding of the potential hydraulic connection using the best available science and information.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

The Olcese Water District GSA does not have any P/MAs with water supplies that feed water recharge P/MAs.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The Olcese Water District is a water district that possesses the legal authority to implement P/MAs discussed herein. Olcese Water District GSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, and the GSA possesses the legal authority necessary to implement the demand management P/MAs that may be defined for its jurisdictional area in the future.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- Olcese Water District general funds.

Estimated costs for Olcese Water District GSA P/MAs by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Olcese Water District GSA	Estimated Costs	
	One-time	Annual
Implemented	$40,000	$97,500
Functional		
In-Process	$75,000	$65,000
As-Needed	$40,000	$2,500
Total	**$155,000**	**$165,000**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, the Olcese Water District GSA is in a state of approximate water supply/demand balance, based on the lack of long-term chronic groundwater level declines in wells screened in the Olcese Principal Aquifer from which groundwater is extracted. Under the projected Baseline and 2030 (and 2070) Climate Change Scenarios a small 180 AFY water supply "deficit" is projected to occur using the checkbook approach within the GSP area; however, as discussed above, this deficit is likely overestimated due to the unique hydrogeologic conditions of the Olcese Principal Aquifer. However, in general terms, one primary means by which deficits can be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Some projects take advantage of additional wet-year supplies that are assumed to be available as capacity increases. Those P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

The Olcese Water District GSA's P/MAs are focused on data gap filling and will serve to improve understanding of the hydrogeologic conditions within the GSA area. Subbasin-wide, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Pioneer GSA

Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage "deficit" of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning documents, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability

Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

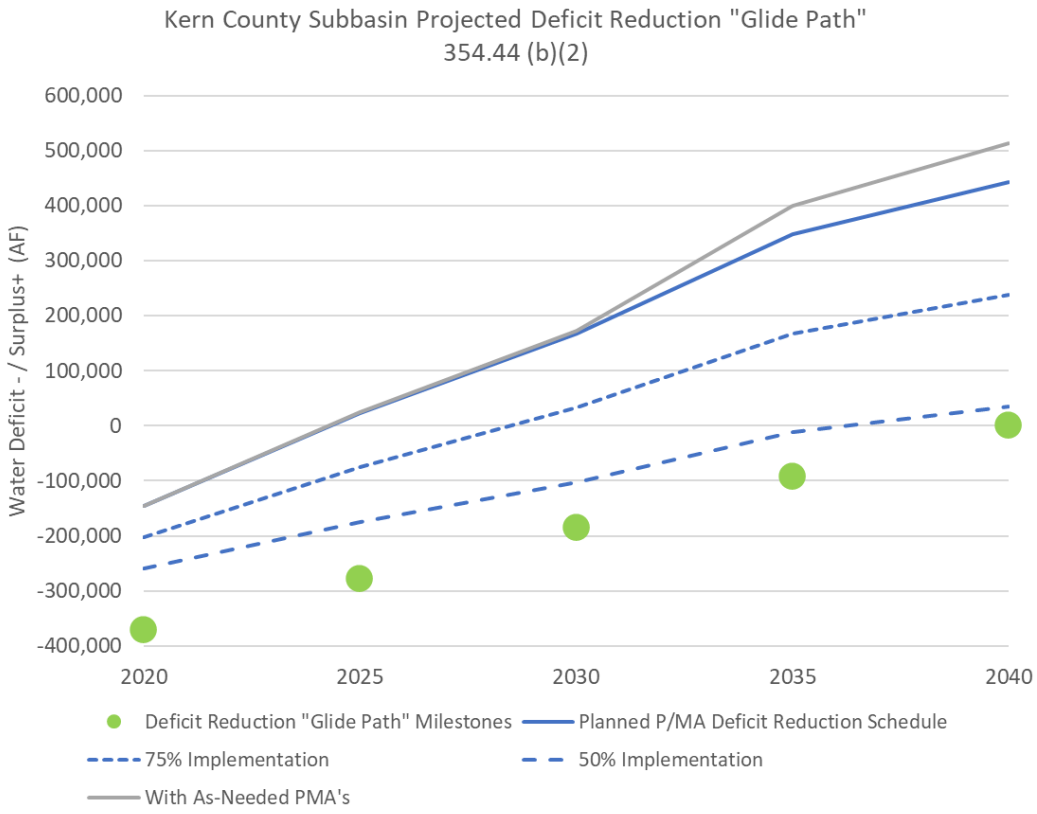


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

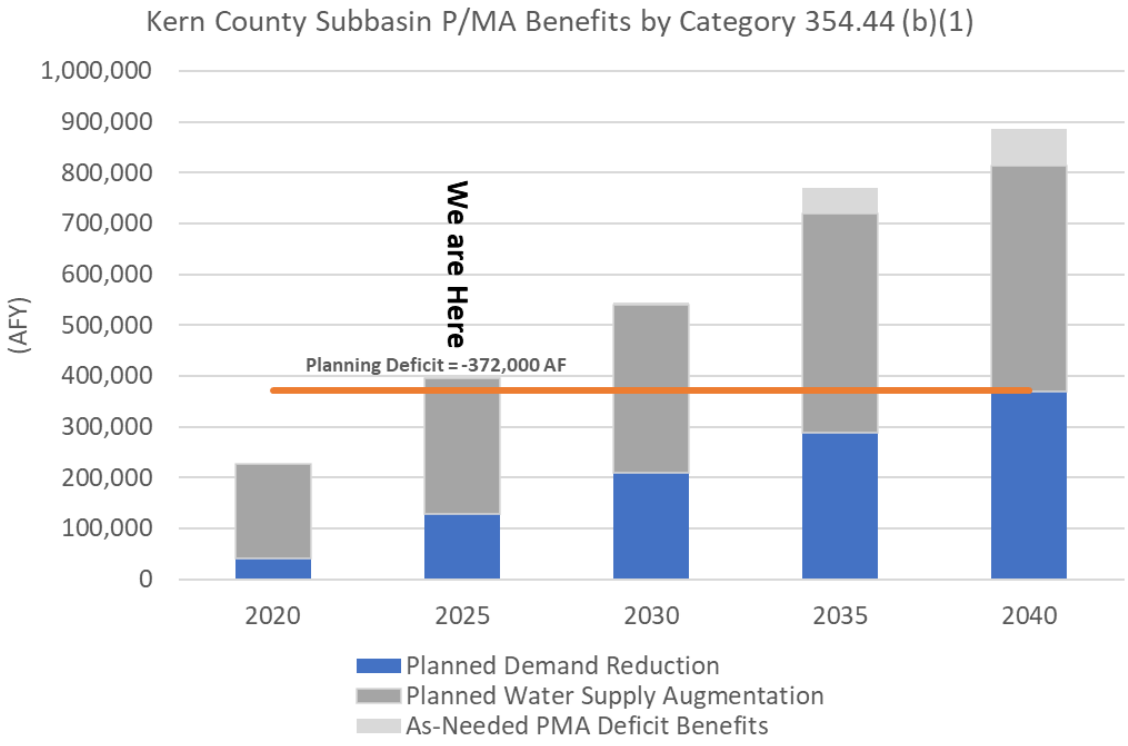


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Pioneer GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Pioneer GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (0 AFY) of the projected deficit of 0 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)- Pioneer

Project and Management Action Implementation Schedule (AFY)						
Pioneer GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	0	0	0	0	0
	Demand Reduction	0	0	0	0	0
	Ag to Urban Conversion	0	0	0	0	0
	Water Conservation-Efficiency	0	0	0	0	0
	Subtotal	**0**	**0**	**0**	**0**	**0**
Planned Water Supply Augmentation	Supplemental Water Recharge	0	0	0	0	0
	Supplemental Water Use	0	0	0	0	0
	Third-Party Banking	0	0	0	0	0
	New Local Supply	0	0	0	0	0
	Exercise of Rights	0	0	0	0	0
	Subtotal	**0**	**0**	**0**	**0**	**0**
P/MA Implementation Schedule*		**0**	**0**	**0**	**0**	**0**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**0**	**0**	**0**	**0**	**0**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

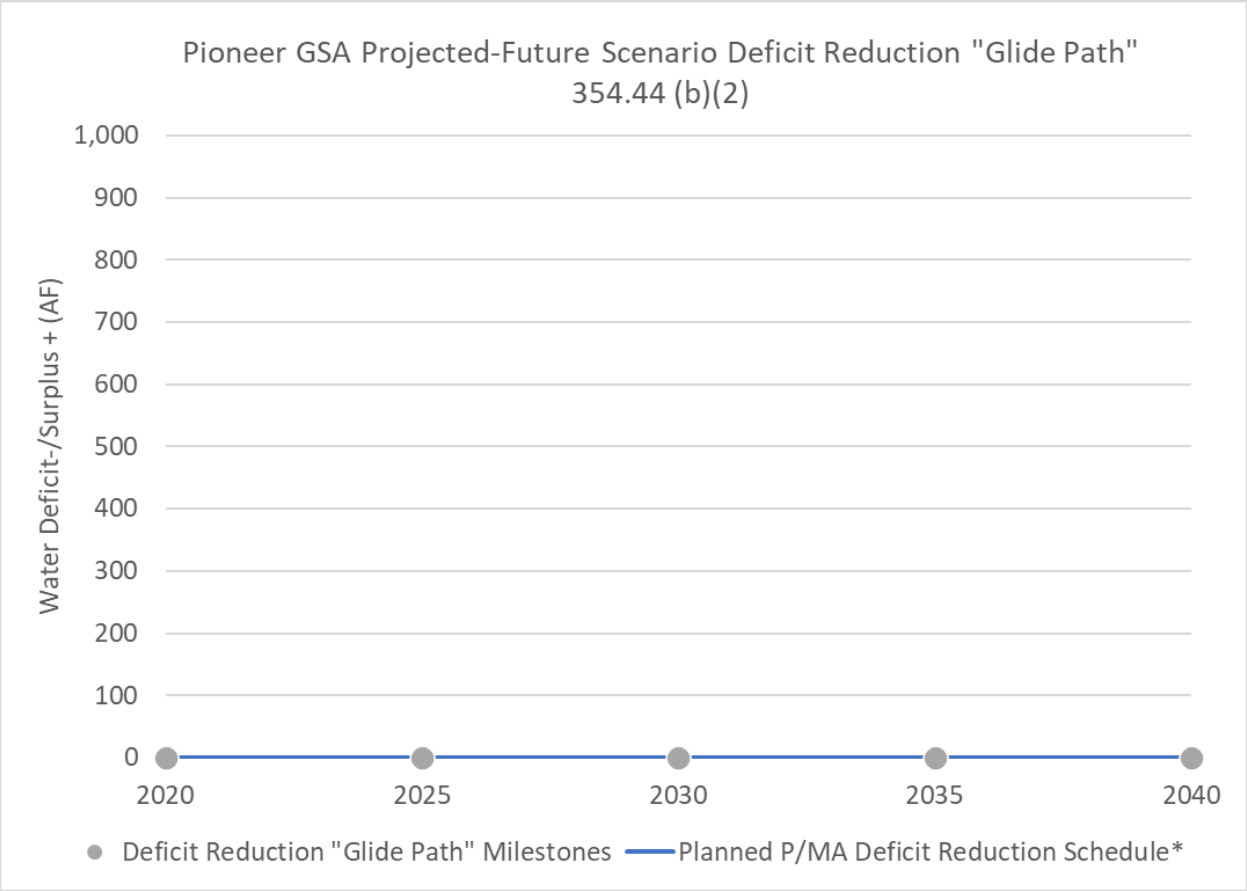


Figure 3. P/MA-5 (Glide Path – P/MA Planned Deficit Reduction vs. Milestones) - Pioneer

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example RRB-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed					
Pio-1	**Install Monitoring Well in North Pioneer**	Installation of a cluster monitoring well in the north portion of the Pioneer Project	✓	✓	✓	NA	Data Gap	NA	Well Permit from KCPHSD	**Complete**	Completed	Completed	2021-	**0**	**0**			✓		✓	NA	NA	$320,000	$0	Pioneer Participant's capital improvement budget
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasiblity Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	Pioneer Participant's capital improvement budget

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed					
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	Pioneer Participant's capital improvement budget
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	Pioneer Participant's capital improvement budget
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	Pioneer Participant's capital improvement budget
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	Pioneer Participant's capital improvement budget

KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	Pioneer Participant's capital improvement budget
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	Pioneer Participant's capital improvement budget
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	Pioneer Participant's capital improvement budget
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
Pio-2	**Continued Participation in Basin-Wide Coordination**	Coordinate with all other GSA's within the Kern Subbasin to address regulatory requirements and determination.	✓	✓	✓	Exercise of Rights	NA	Stakeholder Meetings Board Meetings	NA	**In-Process**	NA	2040	2020-	**0**	**0**	✓	✓	✓	✓	✓	NA	NA	$0	$150,000	Pioneer Participant's capital improvement budget
Pio-3	**Continued Balanced Pumping and Recharge**	Continued balanced pumping and recharge is the standard operating procedure for the Pioneer GSA.	✓	✓	✓	Efficiency	As-needed	NA	NA	**In-Process**	NA	NA	NA	**0**	**0**	✓		✓			NA	NA	$0	$0	NA
Pio-4	**Adaptive Management: Increase Surface Spreading Losses from 6 to 10 Percent**	This adaptive management strategy would explore the feasibility of increasing the fixed loss rate from 6 percent to a fixed loss rate of 10 percent.	✓	✓	✓	Efficiency	NA	Stakeholder Meetings Board Meetings	NA	**As-Needed**	If GWLs fall below MTs in 15 percent of Pioneer's representative monitoring network	NA	NA	**0**	**0**	✓	✓	✓	✓	✓	NA	NA	$0	$0	NA

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

Demand reduction P/MAs are not applicable to the Pioneer GSA.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of Implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA Specific Projects either currently being implemented or have been implemented that contribute to water supply augmentation include:

Water Supply Augmentation P/MAs are not applicable to the Pioneer GSA.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Subbasin is working to implement this project shown in more detail in **Appendix T**. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence under the proposed implementation of the Subbasin GSPs. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results". Sustainable management criteria (SMCs) have been proposed for the FKC that limit subsidence to a 5-year annual average rate of 0.1 feet per year ~~(ft/yr)~~ with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero average subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the GSPs). FWA's position is that the Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

Pio-1 Installation of a Monitoring Well in North Pioneer – Pioneer GSA identified a monitoring data gap on North Pioneer. Installation of a cluster monitoring well was installed in 2019.

KSB-1 Friant-Kern Canal Capacity Mitigation - The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated

facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs, which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy –The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.

c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well

drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by Pioneer GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts. Three projects and management actions have been identified and listed “As Needed” or “In-Process” on Table 3 and help maintain the Pioneer GSA’s sustainability.

Pio- 2 Continued Participation in Basin-Wide Coordination – The Pioneer GSA will continue to coordinate with all other GSA's within the Kern Subbasin to address regulatory requirements and determination. This will allow for the flexibility to adapt to future conditions so that the Pioneer GSA can continue its successful and sustainable management of groundwater resources.

Pio- 3 Continued Balanced Pumping and Recharge – The Pioneer GSA and Pioneer Project will continue balanced pumping and recharge as part of its standard operating procedure through GSP implementation. Through the continued successful balancing and operation of pumping and recharge activities, the Pioneer GSA will be able to adapt to any future Subbasin conditions to maintain its sustainable management of groundwater resources.

Pio-4 Increases Surface Spreading Losses from 6 to 10 Percent – This management action would explore the feasibility of increasing the fixed loss rate of surface spreading from 6 to 10 percent.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

The Pioneer GSA can only recover previously stored surface water and due to these operational constraints, it will never have a water budget deficit.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).

- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2***.***

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period

(i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (Pio-3) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the Friant-Kern Canal through the CVC to the Pioneer Project on behalf of the Pioneer Project Participants for recharge and future recovery for use on lands within Kern County.

State Water Project

DWR delivers water to 29 State Water Project (SWP) Contractors, including 21 south of the Sacramento-San Joaquin River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. Pioneer Project Participants receive SWP water through their respective water supply contracts with the Kern County Water Agency, one of the State Water Project Contractors.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

Pioneer Project Participants receive Kern River water through their respective rights and/or through water service and/or transfer agreements with Kern River water rights

holders. These waters are recharged in the Pioneer Project for future recovery and use on lands within Kern County.

3rd Party Programs

Pioneer GSA does not have any 3rd party programs.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Because the Pioneer GSA encompasses the Pioneer Project which is a dedicated banking program, benefit from additional recharge projects and storage projects are not applicable to the Pioneer GSA.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The Kern County Water Agency is a special district of the State of CA, that possesses the legal authority to implement P/Mas, on behalf of the Pioneer GSA, discussed herein. Pioneer GSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of “one-time” costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- Pioneer Participant assessments.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for Pioneer GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Pioneer GSA	Estimated Costs	
	One-time	Annual
Implemented	$320,000	$95,000
Functional		
In-Process	$25,000	$60,000
As-Needed	$0	$0
Total	**$345,000**	**$155,000**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, the Pioneer GSA maintains sustainability through balanced pumping and recharge which is included as P/MA. Balanced pumping and recharge utilizes surplus water during wet years, and ensuring deficits do not occur through its continued monitoring and checkbook tracking. Through this combination of the GSAs' P/MA efforts, balanced pumping, recharge, checkbook accounting, and groundwater monitoring, the Pioneer GSA will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Rosedale-Rio Bravo Water Storage District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address

25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

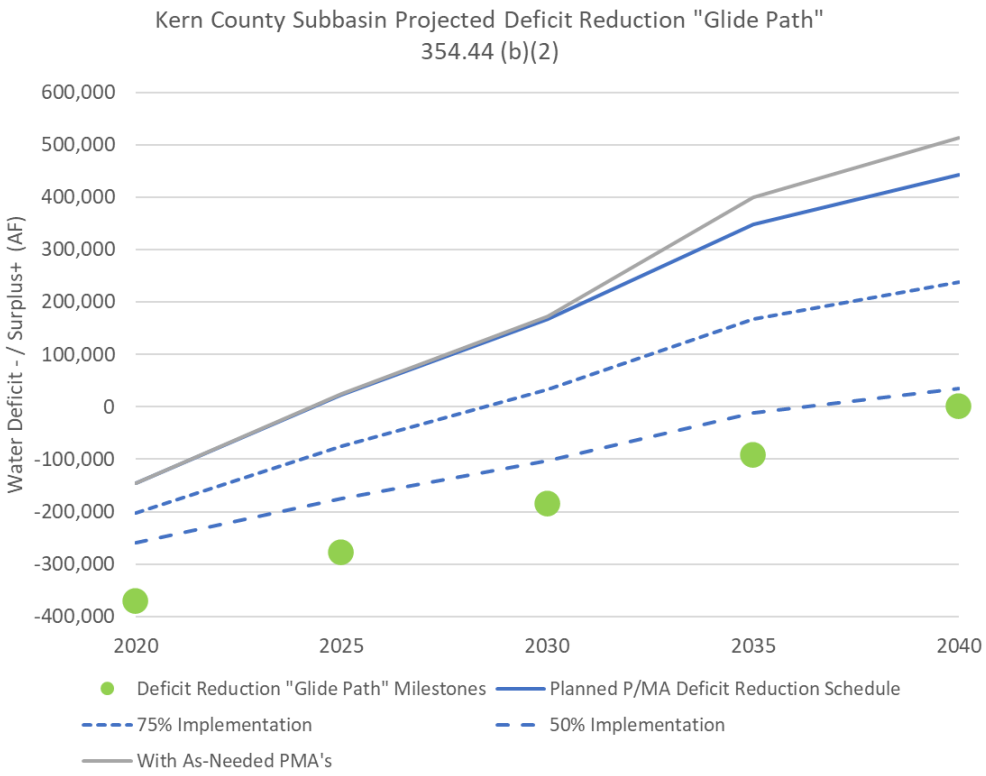


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

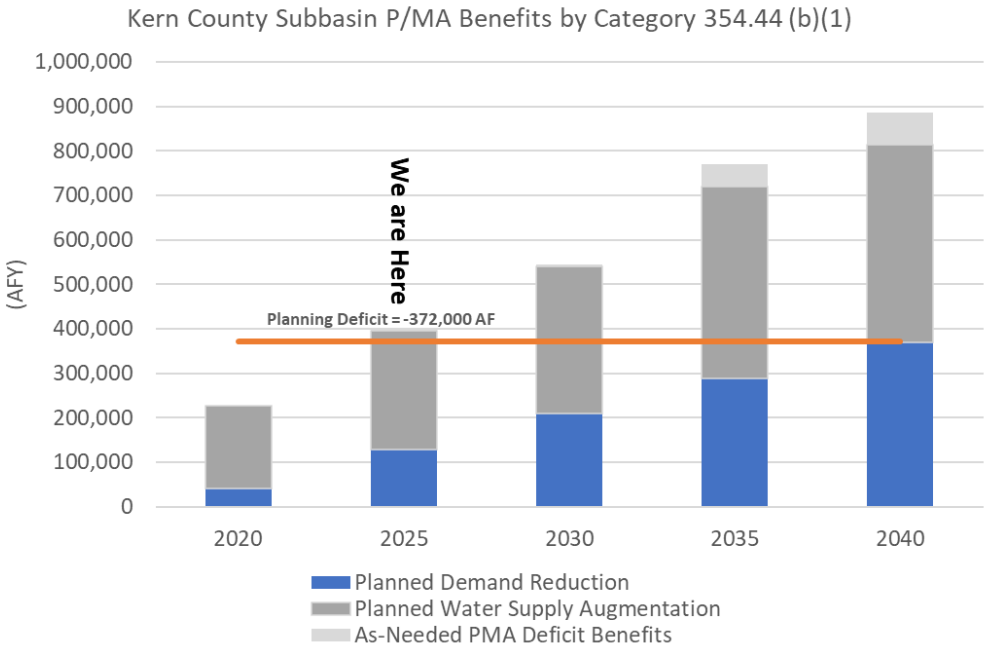


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Rosedale Rio-Bravo Water Storage District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for RRBWSD GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (2,463 AFY) of the projected deficit of 9,850 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Rosedale-Rio Bravo WSD GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-9,850			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-2,463**	**-4,925**	**-7,388**	**-9,850**
Deficit Reduction "Glide Path" Milestones		**-9,850**	**-7,388**	**-4,925**	**-2,463**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	578	2,167	2,620	2,620	2,620
	Demand Reduction	0	3,300	5,600	7,900	10,200
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**578**	**5,467**	**8,220**	**10,520**	**12,820**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking	1,733	2,993	3,533	3,533	3,533
	New Local Supply					
	Exercise of Rights		6,000	6,000	6,000	6,000
	Subtotal	**1,733**	**8,993**	**9,533**	**9,533**	**9,533**
P/MA Implementation Schedule*		**2,311**	**14,460**	**17,753**	**20,053**	**22,353**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*13,157*	*14,283*
Planned P/MA Deficit Reduction Schedule*		**-7,539**	**4,610**	**7,903**	**10,203**	**12,503**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

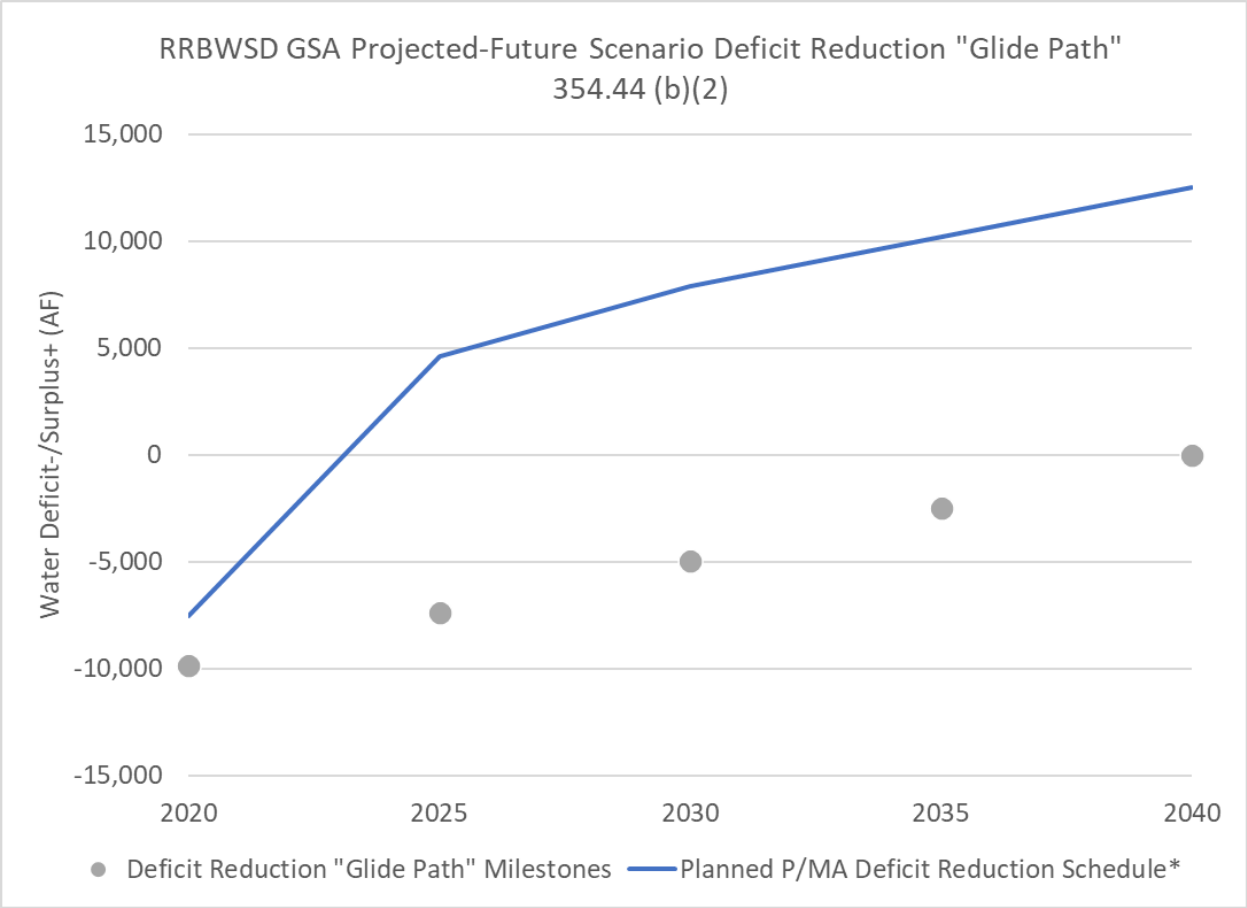


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example RRB-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional	In-Process				As-Needed						
RRB-1	Stockdale East Water Storage and Recovery Project	Acquisition and retirement of 200 acres of irrigated ag lands and development of 200 acres of new recharge ponds. For conjunctive-use and 2:1 third party banking.	✓	✓	✓	Land Retirement Third-Party Banking	Complete	NA	NA	Implemented	Complete	Complete	2019-	1103	578	✓	✓	✓		NA	Kern River Flood, SWP Table A, SWP Article 21 , Friant-Kern Flood, 2:1 Exchanges, Kern River Purchase Contract	None	$2,950,000	$88,500	RRBWSD (Water Charge)
RRB-2	McCaslin Recharge Improvements Phase 1	Acquisition and retirement of 175 acres of irrigated ag lands and development of 175 acres of new recharge ponds. For conjunctive-use and 2:1 third party banking.	✓	✓	✓	Land Retirement Third-Party Banking	Complete	NA	NA	Implemented	Complete	Complete	2023-	630	530	✓	✓	✓		NA	Kern River Flood, SWP Table A, SWP Article 21 , Friant-Kern Flood, 2:1 Exchanges, Kern River Purchase Contract	None	$6,500,000	$118,000	RRBWSD (Water Charge) USBR Grants
RRB-4	Kern Fan Water Storage Project Phase 1	Acquisition and retirement of 350 acres of irrigated ag lands, and development of 350 acres of new recharge ponds. For conjunctive-use and 2:1 third party banking.	✓	✓	✓	Land Retirement Third-Party Banking	Completion of Design	Stakeholder Meetings Board Meetings Hearing	NA	Recharge Complete Recovery in Construction	Current	2025	2025-	1260	1059	✓	✓	✓		NA	Kern River Flood, SWP Table A, SWP Article 21 , Friant-Kern Flood, 2:1 Exchanges, Kern River Purchase Contract	None	$13,000,000	$236,000	RRBWSD (Water Charge) CA WSIP Funding USBR Small Storage Grant
RRB-5	Onyx Ranch Water Acquisition	Acquisition of 4109 acres of land with water rights from the South Fork of the Kern River. Fallowing of ranches and change of point of diversion to Kern Subbasin for groundwater recharge.	✓	✓	✓	Exercise of Rights	Complete	NA	NA	Operational	Complete	Complete	2026-	6000	0	✓	✓			NA	Kern River Pre 1914 Appropriative	None	$33,000,000	$450,000	RRBWSD (Water Charge)
RRB-3	McCaslin/Dillard Recharge Improvements Phase 2	Acquisition and retirement of 150 acres of irrigated ag lands and development of 150 acres of new recharge ponds. For conjunctive-use and 2:1 third party banking.	✓	✓	✓	Land Retirement Third-Party Banking	Completion of CEQA	NA	NA	Environmental and Design	Current	2027	2026-	540	453	✓	✓	✓		NA	Kern River Flood, SWP Table A, SWP Article 21 , Friant-Kern Flood, 2:1 Exchanges, Kern River Purchase Contract	None	$5,500,000	$100,000	RRBWSD (Water Charge) USBR Grants
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	Feasibility Study	NA	2030	2030-	0	0			✓	✓	✓	NA	None	Unknown	Unknown	RRBWSD (Assessments)
RRB-6	Sites Reservoir	New reservoir to capture flood runoff for later recharge in District	✓	✓	✓	Supplemental Water Recharge	Completion of Project	Stakeholder Meetings Board Meetings Hearing	NA	Design	Current	2031	2031-	500	0					NA	Post 1914 Appropriation	None	$9,700,000	$98,000	RRBWSD (Increased Assessment)
RRB-7	Kern Fan Groundwater Storage Project Phase 2	Acquisition and retirement of 850 acres of irrigated ag lands and development of 850 acres of new recharge ponds. For conjunctive-use and 2:1 third party banking. Construction of approximately 400 cfs of conveyance capacity from the California Aqueduct	✓	✓	✓	Land Retirement Third-Party Banking	As Needed	Stakeholder Meetings Board Meetings Hearing	NA	Feasibility	As Needed	2035	2035-	3780	3177	✓	✓	✓		NA	Kern River Flood, SWP Table A, SWP Article 21 , Friant-Kern Flood, 2:1 Exchanges, Kern River Purchase Contract	None	$65,000,000	$944,000	RRBWSD (Water Charge) CA WSIP Funding USBR Small Storage Grant
RRB-8	Ten Section Water Recharge Project	Development of 200 acres of new recharge ponds for conjunctive-use.	✓	✓	✓	Third-Party Banking	As Needed	NA	NA	Feasibility	As Needed	2035	2035-	500	0	✓	✓	✓		NA	Unknown	Unknown	Unknown	Unknown	Private
RRB-9	Land Acquisition and Retirement	Acquisition and retirement of 500 acres of irrigated ag lands.	✓	✓	✓	Land Retirement	As Needed	Stakeholder Meetings Board Meetings Hearing	NA	Feasibility	As Needed	2036	2035-	0	1300					NA	NA	None	$14,500,000	$125,000	RRBWSD (Water Charge)
RRB-10	Western Rosedale In-Lieu Service Area	Construction of In-Lieu Service Area Project in order to provide surface water to agricultural water users within a portion of RRBWSD service area located westerly of Interstate 5.	✓	✓	✓	Third-Party Banking	As Needed	Stakeholder Meetings Board Meetings Hearing	NA	Design Complete On-Hold	As Needed	2035	2040-	1126	0	✓	✓	✓		NA	Kern River Flood, SWP Table A, SWP Article 21 , Friant-Kern Flood, 2:1 Exchanges, Kern River Purchase Contract	None	$5,000,000	$152,000	RRBWSD (Water Charge) CA WSIP Funding USBR Small Storage Grant
RRB-11	Delta Conveyance Project	Participation in the DCP. Alternative under Delta tunnels.	✓	✓	✓	Exercise of Rights	Completion of Project	Stakeholder Meetings Board Meetings Hearing	NA	Environmental Design	Current	2045	2045-	3600	0					NA	SWP Table A, Article 21	None		$3,000,000	RRBWSD (Increased Assessment)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented		Functional		In-Process			As-Needed					
RRB-12	**Project Recovery Operations Plan**	Domestic, small community, and irrigation well mitigation program to address impacts related to temporary lowering of water levels during prolonged droughts on adjacent lands.	✓				NA	Project websites, mailers, local well companies, newspaper articles.	NA	**On-going**	NA	On-going	2010-						✓	✓		None	$0	$45,000	RRBWSD (Assessments)
RRB-13	**White Land Water Budget/Demand Imbalance Reduction**	White Lands (non-RRBWSD lands in RRBWSD GSA) not used for groundwater banking will correct the water supply imbalance by setting water budgets and a linear reduction of 5% per year over the planning period of 2020-2040.	✓	✓	✓	Demand Reduction	NA	Stakeholder Meetings Board Meetings Hearing	NA	**Implemented**	NA	2020	2020-	**0**	**5200**	✓					NA	None	$100,000	$25,000	RRBWSD (Assessments)
RRB-14	**District Land Water Budget/Water Charge Demand Reduction**	Setting of a Sustainable Water Budget and collection of a Groundwater Use Charge assisting with project financing and creating approximately a 2.5% demand reduction.	✓	✓	✓	Demand Reduction	NA	Stakeholder Meetings Board Meetings Hearing	NA	**Implemented**	NA	2023	2024-	**0**	**2000**	✓					NA	None	$100,000	$25,000	RRBWSD (Assessments)
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	RRBWSD (Assessments)
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	RRBWSD (Assessments)
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	RRBWSD (Assessments)
RRB-15	**Conversion of Agricultural Land to Urban Use**	Conversion of 2000 acres of agricultural land to urban use within the limits of each city to reduce groundwater use due to the decreased demand.	✓	✓		Demand Reduction	Already being implemented	Land Use & Planning	District, City & County	**Initiated**	2015	TBD	2030-	**0**	**3,000**			✓			Demand Reduction	District / SGMA authorities	$0	$0	Landowners, Cities & Private
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	SGMA Implementation Grant RRBWSD (Assessments)

KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	RRBWSD (Assessments)
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	RRBWSD (Assessments)
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	RRBWSD (Assessments)
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing												
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
RRB-16	**Land Retirement for Solar Power Production**	Conversion of 1500 acres of irrigated agricultural lands into solar array field.	✓	✓	✓	Land Retirement	Final Approval of Solar Power Project	NA	NA	**Feasibility and Design**	Current	2030	2035-	**0**	**3900**						NA	NA	NA	NA	Private

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs, estimated at 12,820 AFY of benefits, are the primary means of implementation of a “Glide Path” that will result in closing the identified “deficit” of 9,850 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in process that contribute to water demand reduction include:

RRB-1 Stockdale East Water Storage and Recovery Project - Includes the acquisition of 200 acres of irrigated land followed and converted to recharge basins, representing a demand reduction benefit of approximately 578 AFY (Net irrigated x ETiw average for 5 years).

RRB-2 McCaslin Recharge Improvements Phase 1 - Includes the acquisition of 175 acres of irrigated land followed and converted to recharge basins, representing a demand reduction benefit of approximately 530 AFY (Net irrigated x ETiw average for 5 years).

RRB-3 McCaslin/Dillard Recharge Improvements Phase 2 - Includes the acquisition of 150 acres of irrigated land followed and converted to recharge basins, representing a demand reduction benefit of approximately 453 AFY (Net irrigated x ETiw average for 5 years).

RRB-4 Kern Fan Water Storage Project Phase 1 = Includes the acquisition of 350 acres of irrigated land followed and converted to recharge basins, representing a demand reduction benefit of approximately 1059 AFY (Net irrigated x ETiw average for 5-years).

RRB-13 White Land Water Budget/Demand Imbalance Reduction - Implementation of a water balance requirement for land within the RRBWSD GSA but not in the Water Storage District whereby their deficit is reduced each year by 5 percent or ultimately 5,200 AFY. White Lands within the RRBWSD GSA that are not used for water banking will correct the water supply imbalance on a linear basis over the planning period of 2020-2040. Like RRBWSD lands, the white lands will start with a native yield of 0.15 AF/acre. The total annual demand for white lands in the RRBMA is about 10,822 AFY with a water supply imbalance (or deficit) of 5,198 AFY. The average agricultural demand is 2.6 AF/acre according to METRIC studies. While agricultural demands in the White Lands range from 1.4-4.9 AF/acre the initial allowable demand will be the average demand of 2.6 AF/acre. It is expected that white lands would seek to acquire water supplies for in-lieu and direct water recharge via banking agreements with RRBWSD or others to offset demands. Demand reduction will occur as follows over the 2020-2040 period; the imbalance will be reduced by 1/20 of the current imbalance each year (5 %) or 0.1 AF/acre.

RRB-14 District Land Water Budget/Water Charge Demand Reduction - Implementation of a tiered groundwater charge for use above sustainable water budget. Conservative estimated agricultural demand reduction of 2.5 percent or 2000 AFY. The Water Charge would be expected to result in a demand reduction in the Rosedale Rio Bravo Water District (RRBWSD). For market reasons, landowners will probably opt to fallow ground in order to trade water supplies to other District landowners, as well as fallow lands (or limit double cropping) to avoid the Water Charge all together. With an agricultural water consumptive-use demand of about 84,000 AFY, we conservatively expect a 2.5 percent demand reduction as a result of the water charge which results in about 2,000 AFY of reduced demand. This management action could be online as early as 2025. Water Charges could be $100-250 per AF.

RRB-15 Conversion of Agricultural Land to Urban Use - It is expected that land use in the eastern portion of the GSA will be converted from high intensity agricultural uses to urban development. Between 2025 and 2040 it is expected that about 2,000 acres of land will be converted. Given the differences in demand between the two land uses, it is expected that associated demand will be reduced by 3,000 AFY.

KSB-6 White Land Demand Management - The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs, estimated at 9,533 AFY of benefits, are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the identified "deficit" by 9,850 AFY by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented or in-process that contribute to water supply augmentation include:

RRB-1 Stockdale East Water Storage and Recovery Project - Construction of 200 acres of recharge ponds for recharge basins, representing a conservative water supply augmentation of approximately 1103 AFY.

RRB-2 McCaslin Recharge Improvements Phase 1 - Construction of 175 acres of recharge ponds for recharge basins, representing a conservative water supply augmentation of approximately 630 AFY.

RRB-3 McCaslin/Dillard Recharge Improvements Phase 2 - Construction of 150 acres of recharge ponds for recharge basins, representing a conservative water supply augmentation of approximately 540 AFY.

RRB-4 Kern Fan Water Storage Project Phase 1 - Construction of 350 acres of recharge ponds for recharge basins, representing a conservative water supply augmentation of approximately 1260 AFY.

RRB-5 Onyx Ranch Water Acquisition - Acquisition of 4109 acres of land associated with water rights from the South Fork of the Kern River. Fallowing of ranches and change of point of diversion to Kern Subbasin for water recharge, representing a conservative water supply augmentation of approximately 6000 AFY.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that “any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results.” Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated

IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

RRB-11 Project Recovery Operations Plan – RRBWSD GSA will continue the deployment of emergency water services to assist domestic well users that experience impacts at a domestic well; the emergency supply service is dispatched within 24 hours of notification of a well issue. Financial assistance for bottled drinking water is also provided if needed. Currently, there are three emergency units available for providing emergency water supplies; each unit can accommodate service to up to 3 household connections and provide non-potable water for in-home use. This number has been sufficient to accommodate all requests to date. Additional units will be acquired as necessary to accommodate requests. This may coordinate or fold into a subbasin wide program. It is expected that as many as 3 of the approximately 149 domestic wells in the RRBMA could require replacement if levels drop to the established Minimum Threshold; similar impacts within the Rio Bravo Community Watch Area could also be experienced. Should that occur and the Joint or Long-term Operations Plans not

address the issues per the specified mitigation process, the RRBWSD will establish a similar domestic well mitigation program to repair and/or mitigate impacts.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by RRBWSD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new

ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Several P/MAs have been identified and listed “As Needed” on Table 3 and could reduce the deficit by up to 14,283 AFY if needed.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA’s, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects’ infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218

or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the RRBWSD GSA has a Pre-SGMA net water budget deficit of 10,304 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the RRBWSD GSA has reversed the deficit by the implementation of several early P/MA's and demand reduction by 10,000 AFY from the historical period. These efforts eliminated the historical deficit and has actually created a small positive water budget of 2,611 AFY for 2015-2023. It is important to note that the RRBWSD GSA includes approximately 5,800 acres of undistricted lands that depend solely on groundwater. These lands account for about 5,000 AFY of historic deficit within the RRBWSD GSA area. The undistricted lands' deficit is being reduced to 2500 AFY by 2030 and 0 AFY by 2040 pursuant to P/MA RRB-13 (White Land Water Budget/Demand Imbalance Reduction). The RRBWSD (DISTRICT) portion of the RRBWSD GSA deficit during the historical 1995-2014 period therefore had a small net deficit of about 5,000 AFY which has been largely addressed as shown in the 2015-2023 modelled period. The RRBWSD (DISTRICT) portion adopted a new water charge PM/A) in 2023 (RRB-14) which in itself is a demand reduction management action that is expected to close any remaining gap and provide funding for recharge and land retirement projects. The P/MA combined portfolio represented herein is expected to continue the net positive annual water budget of the post-SGMA period and avoid Undesirable Results by reducing demand and increasing supply within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.

- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the “Glide Path” level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the “Glide Path”), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (RRB-1, RRB-2, RRB-3, RRB-4, RRB-7, RRB-10, RRB-11, RRB-12, RRB-12, RRB-13) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the Friant-Kern Canal through the CVC. RRBWSD is a fourth priority non-CVP SOD Contractor that can take CVP water under certain conditions. The Friant-Kern Canal capacity has been recently hampered by subsidence which has limited available supplies. Remediation efforts are underway and should restore access to these critical supplies by 2030.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. RRBWSD currently receives SWP water through a water supply contract (Table 1 Entitlement 35,000 AF) with Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. RRBWSD purchases excess Article 21 water through its State Water Contractor for delivery to existing project recharge facilities using the CVC when such water is available.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

RRBWSD currently receives Kern River water when it is available for water recharge through water service agreements with the City of Bakersfield and other water right holders. Kern River "release" or "flood" water is also available to RRBWSD when water (1) is offered to all takers willing to sign a Notice/Order; or (2) is offered to the Kern River/California Aqueduct Intertie for disposal; or (3) is expected to flood farm acreage; or (4) is expected to be delivered into the Kern River Flood Channel for disposal out-of-county. RRBWSD also takes this released water from the Kern River for water recharge if and when available.

3rd Party Programs

RRBWSD has long operated as 3rd party banking program for several Kern County and outside of Kern County agencies. Over the past several years more interest has been expressed in participating in RRBWSD projects for drought protection needs. Most of these programs are structured on a 2:1 basis, meaning for every acre-foot stored for the 3rd party for later drought supply, RRBWSD receives one for its banking services. These

supplies come from the above three identified sources and have provided groundwater supply for RRBWSD and drought protection for the 3rd party.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Water recharge projects have been designed with a very conservative water supply augmentation benefit calculation considering the participation of 3rd parties in future expansions of its projects based on 2:1 programs. Water supply augmentation benefits have been calculated as follows:

Annual Water Benefit = estimated infiltration rate ft/day * wetted acres * 150 days operation in a wet year * 20 percent of years being wet * 50 percent of stored water to RRBWSD given a 3rd party banking source.

This conservative planning method estimates that the total recharge facility opportunity time would be 8 percent of the time. This is less than half of the long-term (2001-2020) of RRBWSD recharge facilities actual of 20 percent utilization.

Potential water supplies that feed water supply acquisition P/MA RRB-4 come from the following source.

The Onyx Ranch project (SCH No. 2018021061) is to change the point of diversion of water available to RRBWSD under its owned Onyx Ranch and Smith Ranch appropriative water rights from the South Fork Valley to the RRBWSD valley floor service area, without injuring other legal users of water. Historically, the water available under these water rights was used for irrigated agriculture in the South Fork Valley. The proposed project involves converting the irrigated fields of the Onyx Ranch and Smith Ranch, which are predominately high consumptive use lower value forage crops, to non-irrigated uses, such as non-irrigated pasture and native vegetation. The amount of water that would have been diverted for the Onyx Ranch and one-third of the Smith Ranch (RRBWSD owned portion) in a given month will then remain in the South Fork Kern River, through Isabella Reservoir, down the lower Kern River to facilities available to RRBWSD. Upon diversion, RRBWSD would comingle the water with its other available surface water supplies for use in its various water management programs to meet existing agricultural and M&I water demands within the RRBWSD service area in Kern County.

The majority of RRBWSD's pre-1914 appropriative rights on the South Fork Kern were quantified in a 1902 Arbitration Decree ("1902 Decree"). The 1902 Decree provides for a specified quantity of diversion, in order of priority, for the named priority rights in the decree, and further, to the extent there is additional flow available above and beyond the demands of the named priority rights, an equal division among the parties named in the decree. RRBWSD's decreed rights are listed in the table as the 1st, 3rd, 6th, 7th, 12th, 30th and 33rd priority rights. The decreed water rights relate to the majority of the Onyx Ranch property acquired by RRBWSD. However, two portions of the Onyx Ranch

property were not covered by the 1902 Decree: (1) the Wirth/Lieb fields (160 acres in NW 1/4 of section 13 of T.26S. R.34E; 45.88 acres from Hochman in the NE 1/4 of SW 1/4 of section 13 and NW 1/4 of SE 1/4 of section 14, both in T.26S R.34 E)) and (2) the Boone field (160 acres in the SE quarter of Section 7, T.26S. R. 35 E.). (State Statement Number: S021076, S021078, S021079, S021077).

The pre-1914 appropriative rights for the Wirth/Lieb field are documented in the deeds for the property and historic reports describing when the ditch serving the property was constructed in relation to the other ditches along the river. These documents discuss an 1870 ditch, which places the priority of the right between the 11th and 12th in the 1902 Decree.

The Boone field has riparian rights with an 1882 priority date. The riparian rights for the Boone field cannot be transferred. However, water diversions under the Boone riparian right could be reduced to make more water available for appropriative rights junior to 1882, such as the 33rd right under the 1902 Decree.

RRBWSD also acquired a one-third interest in the Smith Ranch (about 690 acres), including its water rights. The Smith Ditch, which serves the Smith Ranch, is one of the oldest water rights on the South Fork Kern, with a priority date of 1861/62.

For all rights the same methodology used in the decree to quantify the rights is for all properties; this method assumes a 150 miner's inch diversion right, under a four-inch pressure, for each 160 acres. This is roughly equivalent to 3 cfs per 160 acres. (State Statement Number: S001456)

Potential water supplies that feed water supply acquisition P/MA RRB-8 and RRB-9 come from the following source.

Both the Sites Reservoir and Delta Conveyance Project rely on pursuing a water right permit and/or amendment from the State Water Resources Control Board (SWRCB), which will provide them legal authority to divert water within certain conditions, for a specific purpose, and use within a specified area. The Sites Reservoir Authority and the Department of Water Resources are responsible for all project water rights permitting.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The RRBWSD is a water storage district (pursuant to Cal. Water Code § 39000 - 48401) that has water supply, water management, or land use responsibilities within the Subbasin. (Cal. Water Code § 10721(n)). RRBWSD is also a GSA for those lands within its boundaries. RRBWSD has entered into SGMA contracts with certain landowners outside of RRBWSD's water service area that are within the boundary of KNDLA. Pursuant to such SGMA contracts and RRBWSD's membership in KNDLA, RRBWSD has the authority to include these areas outside the RRBWSD service area in its GSA boundaries and otherwise impose P/MAs, including demand management, on the lands

that are subject to the contracts. RRBWSD is also a general member of the KNDLA and has entered into an agreement with KNDLA providing RRBWSD the jurisdiction to implement P/MAs, including the demand management P/MAs discussed herein, on those lands outside of the RRBWSD boundary but within the KNDLA boundary where RRBWSD has contracted with the landowner for SGMA purposes. This arrangement is consistent with the intent of the legislature in enacting SGMA, to manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible. (Cal. Water Code § 10720.1(h)).

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of “one-time” costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for RRBWSD GSA P/MA’s by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

RRBWSD GSA	Estimated Costs	
	One-time	Annual
Implemented	$55,650,000	$1,082,500
Functional		
In-Process	$5,525,000	$160,000
As-Needed	$94,200,000	$4,319,000
Total	**$155,375,000**	**$5,561,500**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. The formation of a groundwater budget program would likely include mechanisms to allow for trading or exchange of pumping allocations within designated areas, subject to constraints dictated by groundwater conditions observed within the Monitoring Network and policies developed by the respective Board of Directors. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Southern San Joaquin Municipal Utility District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

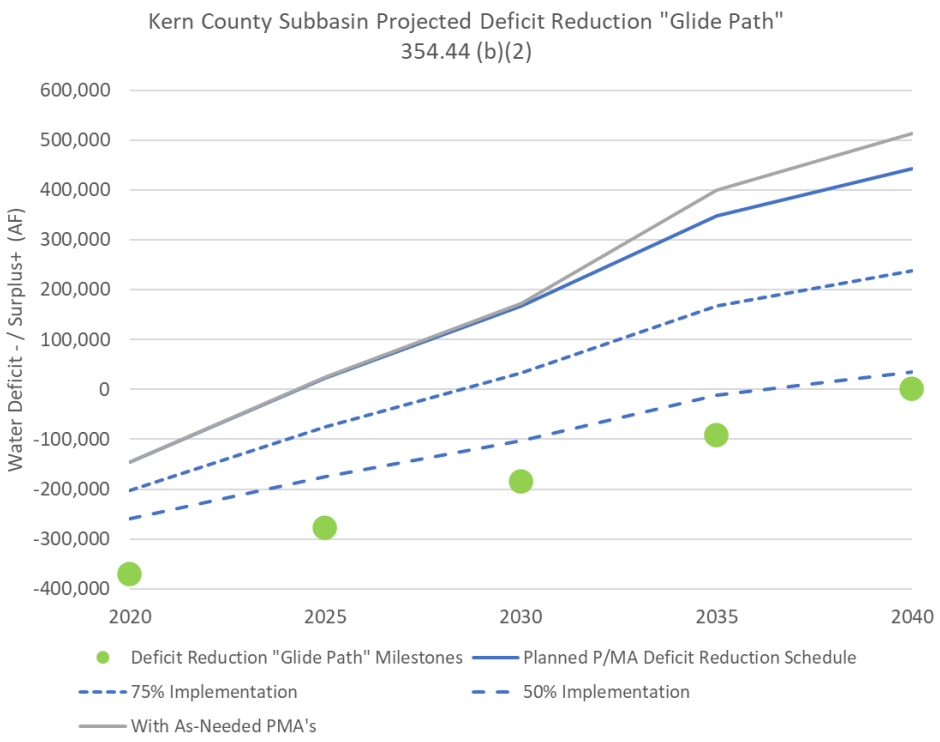


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

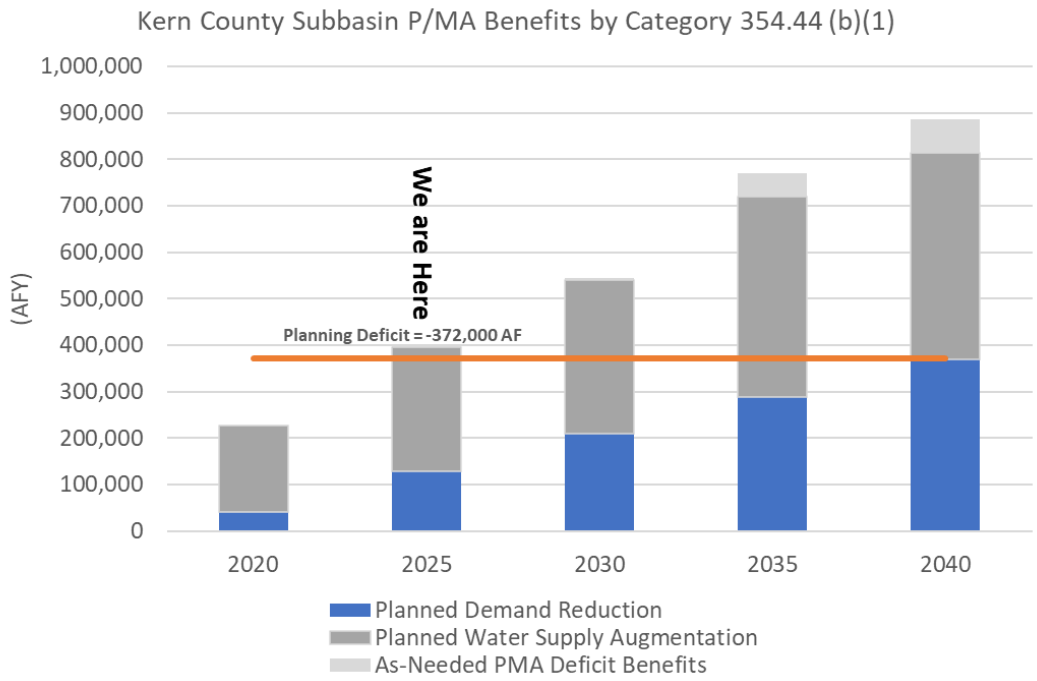


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Southern San Joaquin Municipal Utility District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for the Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for SSJMUD GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (8,403 AFY) of the projected deficit of 33,610 AFY during each five-year Milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2035.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
SSJMUD GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit		-26,070				
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-6,518**	**-13,035**	**-19,553**	**-26,070**
Deficit Reduction "Glide Path" Milestones		**-26,070**	**-19,553**	**-13,035**	**-6,518**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	0	0	0	0	0
	Demand Reduction	86	445	2,427	2,427	2,840
	Ag to Urban Conversion	0	664	1,328	1,992	2,656
	Water Conservation-Efficiency	0	0	0	0	0
	Subtotal	**86**	**1,109**	**3,755**	**4,419**	**5,496**
Planned Water Supply Augmentation	Supplemental Water Recharge	642	2,559	11,616	11,616	11,616
	Supplemental Water Use	0	0	0	0	0
	Third-Party Banking	5,000	5,000	5,000	5,000	5,000
	New Local Supply	0	0	0	0	0
	Exercise of Rights	4,850	4,850	4,850	4,850	4,850
	Subtotal	**10,492**	**12,409**	**21,466**	**21,466**	**21,466**
P/MA Implementation Schedule*		**10,578**	**13,518**	**25,221**	**25,885**	**26,962**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*1,632*
Planned P/MA Deficit Reduction Schedule*		**-15,492**	**-12,552**	**-849**	**-185**	**892**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

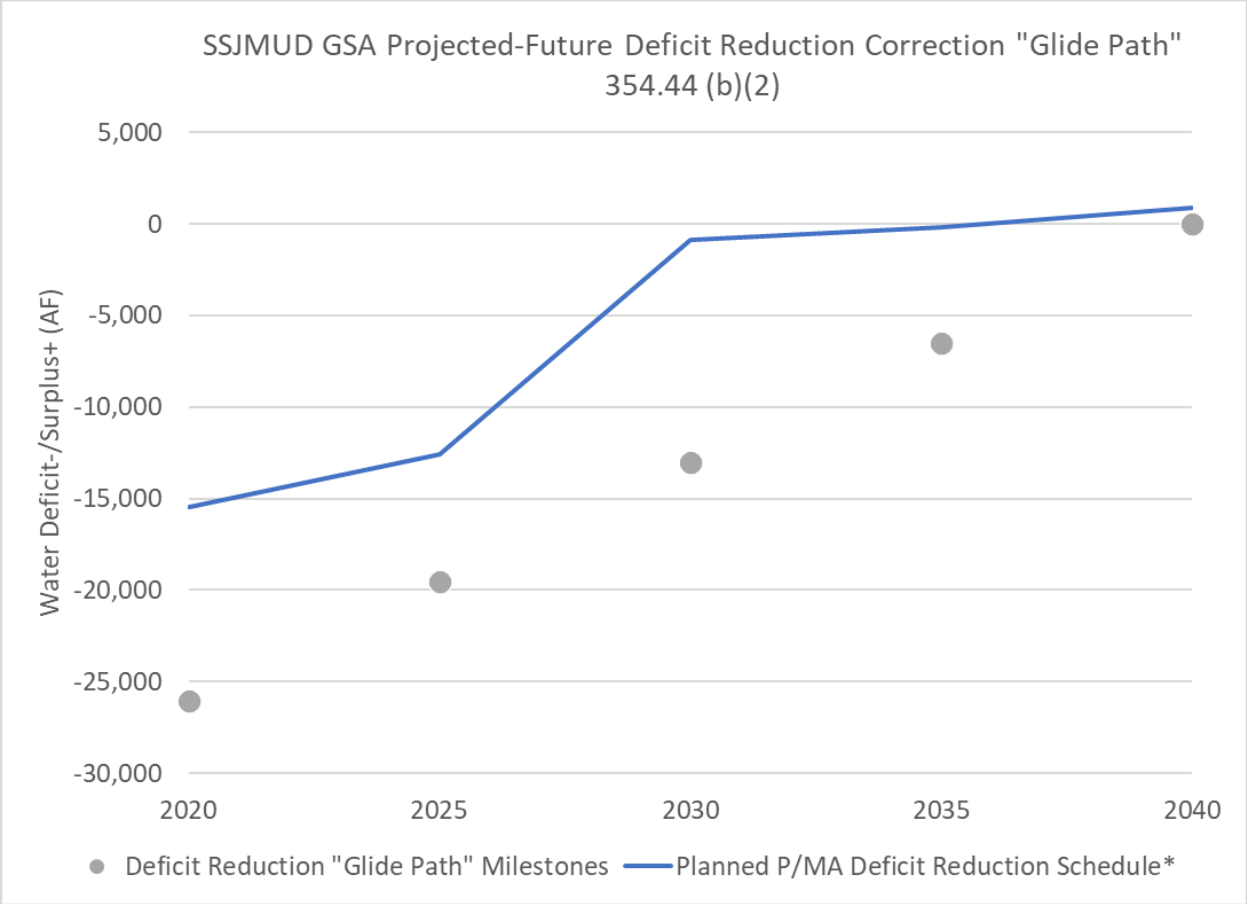


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example SSJMUD-#) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented		Functional		In-Process			As-Needed					
SSJMUD-1	Exercising Existing Water Rights	The USBR, SLDMWA, FWA, and SJREC have entered into a MOU to collectively identify projects and potential actions aimed at improving drought resiliency South of the Delta, including SSJMUD deliveries from the Friant-Kern Canal (FKC). The South of Delta Drought Resiliency Framework allows participating entities to voluntarily conserve and securely store a portion of their CVP south of Delta deliveries for subsequent use with the goal of providing at least a 5% allocation to CVP south of Delta agricultural water service/repayment contracts, reducing reliance on Delta exports in drought years.	□			Exercise of Rights	Underway	NA	NA	MOU effective March 2024	2023	2024	2024-	4850	0			□			Increased reliability of SSJMUD's CVP supplies	Signed MOU	-	-	-
SSJMUD-2	Subbasin Banking Partnerships	Partners with neighboring water district to bank up to 15,000 AFY in existing banking facilities when excess surface water supplies are available. This partnership provides a "leave behind" volume of water to the banking partner, and returns previously banked water when requested.	□			3rd Party Banking	Implemented	NA	NA	Implemented	Below Normal Water Years	Complete	2018 with return capacity increase as of 2024-	5000	0			□		NA	Friant-Kern Supply and Class I/II Unreleased Restoration Flows (URF), and Section 215	None	$1,200,000	$180,000	Grants and SSJMUD Water Charge
SSJMUD-3	Pandol Spreading Grounds	Acquisition and retirement of 30 acres of irrigated ag lands and development of 30 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Complete	NA	NA	Implemented	Complete	Complete	2017-	275	72	□	□	□		NA	Friant-Kern Supply, URF, and Section 215	None	$660,000	$2,550	Grants and SSJMUD Water Charge
SSJMUD-4	City of Delano Spreading Grounds	Acquisition and retirement of 40 acres of irrigated ag lands and development of 40 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Complete	NA	NA	Implemented	Complete	Complete	2017-	367	14	□	□	□		NA	Friant-Kern Supply, URF, and Section 215	None	$880,000	$3,400	Grants and SSJMUD Water Charge
SSJMUD-5	Sebastian North Lake Spreading Grounds (Formerly In District Spreading Grounds)	Acquisition and retirement of 33 acres of irrigated ag lands and development of 33 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Complete	NA	NA	Implemented	Complete	Complete	2019-	303	12	□	□	□		NA	Friant-Kern Supply, URF, and Section 215	None	$704,000	$2,720	Grants and SSJMUD Water Charge
SSJMUD-6	Giumarra Spreading Grounds	Acquisition and retirement of 79 acres of irrigated ag lands and development of 79 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Complete	NA	NA	Implemented	Complete	Complete	2022-	725	160	□	□	□		NA	Friant-Kern Supply, URF, and Section 215	None	$1,716,000	$6,800	Grants and SSJMUD Water Charge
SSJMUD-7	Regan Spreading Grounds	Acquisition and retirement of 75 acres of irrigated ag lands and development of 75 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Complete	Board Meetings IS/MND Noticing	CEQA / NEPA	Implemented	Complete	Complete	2024-	689	187	□	□	□		NA	Friant-Kern Supply, URF, and Section 215	None	$1,650,000	$6,375	Grants and SSJMUD Water Charge
SSJMUD-14	Landowner Subsurface/Surface Recharge Program	A voluntary landowner program that encourages use of existing landowner agricultural lands that are cropped for a portion of the year and remain fallow the remain of the year to implement groundwater recharge during fallow periods. This program promotes infiltration of available water supplies for improved groundwater management.	□	□	□	Supplemental Water Recharge	Complete	NA	NA	Implemented	Complete	Complete	2023-	200	0	□	□	□		NA	Friant-Kern Supply, URF, and Section 215	None	$0	$34,000	SSJMUD Water Charge

SSJMUD-8	**Giumarra Additional Spreading Grounds**	Acquisition and retirement of 80 acres of irrigated ag lands and development of 80 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Complete	Board Meetings IS/MND Noticing	CEQA / NEPA	**Functional**	Current	2025	2025-	**734**	**171**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$1,760,000	$6,800	Grants and SSJMUD Water Charge
SSJMUD-9	**Urban Land Conversions**	Based on General Plans and Urban Water Management Plans, urban sprawl from the cities of Delano and McFarland will cause agricultural land to be taken out of production and converted to residential and commercial developments. Demand reduction is calculated based on an average change in ET.	□	□	□	Ag to Urban Conversion	Anticipated	NA	NA	**Functional**	NA	2040	2020-2040	**-**	**2656**			□			NA	None	-	-	NA
SSJMUD-10	**Caratan Spreading Grounds**	Acquisition and retirement of 160 acres of irrigated ag lands and development of 160 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Preliminary Design, Pre-Construction Bidding	Board Meetings IS/MND Noticing	CEQA / NEPA	**Design and Construction**	Current	2025	2025-	**1469**	**315**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$3,520,000	$13,600	Grants and SSJMUD Water Charge
SSJMUD-15	**Sebastian South Lake Spreading Grounds**	Acquisition and retirement of 52 acres of irrigated ag lands and development of 43 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Grant Funding Application, CEQA/NEPA	Board Meetings IS/MND Noticing	CEQA / NEPA	**Property Lease to be finalized in 2025**	Current	2026	2026-	**483**	**18**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$704,000	$2,720	Grants and SSJMUD Water Charge
SSJMUD-11	**Caratan Additional Spreading Grounds**[1]	Acquisition and retirement of 694 acres of irrigated ag lands and development of 694 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Grant Funding Application, CEQA/NEPA	Board Meetings IS/MND Noticing	CEQA / NEPA	**Property Purchased**	Current	2027-2030	2026-			□	□	□			Friant-Kern Supply, URF, and Section 215	None	$11,110,000	$42,925	Grants and SSJMUD Water Charge
SSJMUD-11a	**Bowman Spreading Grounds Phase 1**	Acquisition and retirement of 39 acres of irrigated ag lands and development of 39 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Grant Funding Application, CEQA/NEPA	Board Meetings IS/MND Noticing	CEQA / NEPA	**Property Purchased**	Current	2027	2027-	**358**	**83**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$858,000	$3,315	Grants and SSJMUD Water Charge
SSJMUD-11b	**Bowman Spreading Grounds Phase 2**	Acquisition and retirement of 156 acres of irrigated ag lands and development of 156 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Grant Funding Application, CEQA/NEPA	Board Meetings IS/MND Noticing	CEQA / NEPA	**Property Purchased**	Current	2028	2028-	**1432**	**332**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$3,432,000	$13,260	Grants and SSJMUD Water Charge
SSJMUD-11c	**Wollomes Avenue Spreading Grounds**	Acquisition and retirement of 312 acres of irrigated ag lands and development of 312 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Grant Funding Application, CEQA/NEPA	Board Meetings IS/MND Noticing	CEQA / NEPA	**Property Purchased**	Current	2029	2029-	**2864**	**665**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$6,864,000	$26,520	Grants and SSJMUD Water Charge
SSJMUD-11d	**Wallace Rd Spreading Grounds**	Acquisition and retirement of 187 acres of irrigated ag lands and development of 187 acres of new recharge ponds.	□	□	□	Land Retirement, Supplemental Water Recharge	Grant Funding Application, CEQA/NEPA	Board Meetings IS/MND Noticing	CEQA / NEPA	**Property Purchased**	Current	2030	2030-	**1717**	**398**	□	□	□			Friant-Kern Supply, URF, and Section 215	None	$4,114,000	$15,895	Grants and SSJMUD Water Charge
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	□		□		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			□	□	□	NA	None	Unknown	Unknown	SSJMUD Water Charge

1 Since the earlier version of the PMA table was developed, in preparation of design and construction, the additional Caratan Spreading Grounds has been broken into four individual projects

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional	In-Process				As-Needed						
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	□	□			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	Implemented	NA	2020	2020-	0	0	□				□	NA	NA	$0	$25,000	SSJMUD Assessments
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	□	□	□		When an MT exceedance occurs for any sustainability indicator.	NA	NA	Implemented	NA	2024	2024-	0	0				□	□	NA		$0	$25,000	SSJMUD Assessments
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	□	□			When declining groundwater levels impact domestic or small community wells.	Refer to Subbasin Outreach and Engagement Plan	NA	Initiating Development	NA	2025	2025-	0	0				□		NA	NA	$0	$45,000	SSJMUD Assessments
SSJMUD-12	White Land Demand Reduction	White Lands (non-SSJMUD lands) will correct the water supply imbalance by setting water budgets and a linear reduction that corrects overdraft by 2040.	□		□	Demand Reduction	NA	Stakeholder Meetings Board Meetings Hearing	NA	Planning	NA	2040	2040	0	413			□			NA	None	-	-	NA
KSB-4	Coordination with Basin Study	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	□	□	□		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	Ongoing	NA	2025	2025-	0	0					□	NA	NA	$25,000	$0	SSJMUD Assessments
KSB-6	White Land Demand Management	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	□	□	□	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	Initiating Development	NA	2030	2030-	0	20,410	□				□	NA	None	$0	$10,000	SSJMUD Assessments
KSB-7	Well Registry	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	□	□	□			Refer to Subbasin Outreach and Engagement Plan	NA	Ongoing	NA	2024-	2024-	0	0				□	□	NA	NA	$0	$25,000	SSJMUD Assessments
KSB-8	Consumptive-Use Study	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	□	□	□			Refer to Subbasin Outreach and Engagement Plan	NA	Ongoing	NA	2020-	2020-	0	0				□	□	NA	NA	$0	$25,000	SSJMUD Assessments
SSJMUD-13	Land Acquisition and Retirement	Acquisition and retirement of irrigated ag lands.	□		□	Demand Reduction	NA	Stakeholder Meetings Board Meetings Hearing	NA	As-Needed	NA	2035	2035	0	1219			□			NA	None	$13,475,000	$116,500	SSJMUD Water Charge

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the estimated “deficit” by 33,610 AFY by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in process that contribute to water demand reduction include:

SSJMUD-3, Pandol Spreading Grounds. Acquisition and retirement of 30 acres of irrigated ag lands that will be converted to 30 acres of new recharge ponds. Construction of the ponds was completed in 2017. Demand reduction from taking agricultural lands out of production is 72 AFY.

SSJMUD-4, City of Delano Spreading Grounds. Acquisition and retirement of 40 acres of irrigated ag lands that will be converted to 40 acres of new recharge ponds. Construction of the ponds was completed in 2017. Demand reduction from taking agricultural lands out of production is 14 AFY.

SSJMUD-5, In-District Spreading Grounds. Acquisition and retirement of 32 acres of irrigated ag lands that will be converted to 32 acres of new recharge ponds. Construction of the ponds was completed in 2019. Demand reduction from taking agricultural lands out of production is 11 AFY.

SSJMUD-6, Giumarra Spreading Grounds. Acquisition and retirement of 78 acres of irrigated ag lands that will be converted to 78 acres of new recharge ponds. Construction of the ponds was completed in 2022. Demand reduction from taking agricultural lands out of production is 160 AFY.

SSJMUD-7, Regan Spreading Grounds. Acquisition and retirement of 80 acres of irrigated ag lands that will be converted to 80 acres of new recharge ponds. Construction of the ponds was completed in 2024. Demand reduction from taking agricultural lands out of production is 187 AFY.

SSJMUD-8, Giumarra Additional Spreading Grounds. Acquisition and retirement of 80 acres of irrigated ag lands that will be converted to 80 acres of new recharge ponds. Construction of the ponds was completed in 2025. Demand reduction from taking agricultural lands out of production is 171 AFY.

SSJMUD-9, Urban Land Conversions. Based on General Plans and Urban Water Management Plans, urban sprawl from the cities of Delano and McFarland will cause irrigated agricultural land to be taken out of production and converted to residential and commercial developments. Demand reduction is calculated based on an average change in ET. The estimated demand reduction is 2,656 AFY.

- City of Delano has identified 2,100 acres to be converted to urban use: estimated demand reduction is 900 AF by 2030 and another 843 AF by 2040.
- City of McFarland has identified 1,100 acres to be converted by 2040; estimated demand reduction is 913 AF by 2040.

SSJMUD-10, Caratan Spreading Grounds. Acquisition and retirement of 160 acres of irrigated ag lands that will be converted to 160 acres of new recharge ponds. Construction of the ponds was completed in 2025. Demand reduction from taking agricultural lands out of production is 315 AFY.

SSJMUD-11, Caratan Additional Spreading Grounds. Acquisition and retirement of 505 acres of irrigated ag lands that will be converted to 505 acres of new recharge ponds. Construction of the ponds was completed in 2026. Demand reduction from taking agricultural lands out of production is 1,478 AFY.

SSJMUD-12, White Land Demand Reduction. SSJMUD offers GSA coverage to 1,083 acres of undistricted lands. Since these lands do not have access to district surface water supplies, a demand management program will be implemented to limit groundwater extraction to the Subbasin's sustainable yield. Assuming an average ET of 3.29 AF/ac, and native yield of 0.15 AF/ac, the overdraft correction is 3,400 AFY.

SSJMUD-15, Sebastian South Lake Spreading Grounds. Acquisition and retirement of 52 acres of irrigated ag lands that will be converted to 43 acres of new recharge ponds. Construction of the ponds was completed in 2026. Demand reduction from taking agricultural lands out of production is 18 AFY.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MAs

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 33,610 AFY by the January 2040 GSP implementation deadline.

GSA-specific Projects that are in-process as well as those that already been implemented or currently being implemented that contribute to water supply augmentation include:

SSJMUD-1 Exercise Existing Water Rights - SSJMUD participates in the Friant Water Authority (FWA) Drought Plan MOU between USBR, Exchange Contractors, Friant Contractors and Westside Contractors to work together to bolster dry year supplies. At a minimum, this MOU will provide an additional 5% Class 1 reliability. Friant-wide, the Class 1 total is 800,000 AFY. SSJMUDs allocation is 97,000 AFY, which will yield a minimum of 4,850 AFY increase in supply.

SSJMUD-2 Subbasin Banking Partnerships - Prior to building in-district recharge facilities, SSJMUD partnered with a neighboring water district in a third-party banking program to bank up to 15,000 AFY in existing banking facilities when excess surface water supplies are available. This partnership provides a "leave behind" volume of water to the banking partner and returns previously banked water to SJJMUD when requested. The partnership began in 2018. To date, the current volume available for return is 35,749 AF. SSJMUD's agreement allows for up to 5,000 AFY to be returned via the Friant-Kern Canal (FKC).

SSJMUD-3 Pandol Spreading Grounds - 30 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 275 AFY.

SSJMUD-4 City of Delano Spreading Grounds - 40 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 367 AFY.

SSJMUD-5 In-District Spreading Grounds - 32 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 303 AFY.

SSJMUD-6 Giumarra Spreading Grounds - 78 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 725 AFY.

SSJMUD-7 Regan Spreading Grounds - 80 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 689 AFY.

SSJMUD-8 Giumarra Additional Spreading Grounds - 80 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 734 AFY.

SSJMUD-10 Caratan Spreading Grounds - 160 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 1,469 AFY.

SSJMUD-11 Caratan Additional Spreading Grounds - 505 acres of recharge ponds constructed in 2017. Based on the method described above, water supply augmentation is estimated at 6,371 AFY.

Data-Gap Filling and Mitigation Efforts

Management Actions either currently being implemented or have been implemented that contribute to water demand reduction include:

KSB-1 Friant-Kern Canal Capacity Mitigation - The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that “any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results.” Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA’s position is that the Kern Subbasin GSAs should minimize and

mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs - The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.

c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program - The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern

Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry. In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study. The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to

an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by SSJMUD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact projects and actions to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

SSJMUD-13 was identified and listed “As Needed” on Table 3 and could reduce the deficit by up to 1,219 AFY if needed. SSJMUD-13, Land Acquisition and Retirement Demand Reduction. Currently, the Subbasin relies on checkbook accounting based on water supply and use over a period of time (currently 2010 to 2019), which estimates each GSAs deficit. The Basin Study is expected to provide a better understanding for the actual deficit. As groundwater allocation/deficit is better understood, SSJMUD will continue to refine PMAs. If additional demand reduction is needed, a land acquisition and retirement program will be implemented. Currently, the remaining deficit to be addressed in 2030 is 1,219 AFY.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented. In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional. In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process. Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As Needed. As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MAs, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the SSJMUD GSA has a Pre-SGMA net water budget deficit of 26,541 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the SSJMUD GSA has a deficit of 33,987 AFY. The P/MA combined portfolio represented herein is expected to eliminate the deficit annual water budget and avoid Undesirable Results by reducing demand and increasing supply within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

P/MAs that are in-progress as well as those that already been implemented that contribute to water demand reduction include assumptions as follows:

- Converting irrigated land to recharge basins, representing a demand reduction benefit estimated based on ITRC-METRIC results. Average ET from 1993 to first year of operations minus average ET of precipitation from bare ground (estimated as 80% of average precipitation 7.29 inches (1993-2022). Demand reduction for lands converted from irrigated agriculture to recharge basins ranges from 0.73 AF/ac (fallow land) to 2.47 AF/ac. The average of the irrigated acres is 1.88 AF/ac.
- Converting irrigated land to urban use. Consistent with UWMP prepared by the cities of Delano and McFarland, water demand will be reduced through land

conversions from irrigated agriculture to residential or commercial use. The estimated demand reduction rate is 0.83 AF/ac. Acres estimated to be converted in each 5-year period is consistent with SSJMUD's glidepath of 25% each 5-year period.

- Exercising existing water rights and calling for return of previously banked water. These programs and their expected benefits are described in the project summaries below.
- SSJMUD primarily intends to use its existing water rights and conjunctive use program to limit groundwater pumping to sustainable yield. Average annual water supply augmentation through constructing spreading grounds was estimated individually based on historic water availability adjusted to 4 out of 10 years for completed basins and based on assumed water available in 4 of 10 years, 0.5 feet per day of recharge for an average of 85 days per year in the years when water is available. Water supply is Central Valley Project Class 1 (97,000 AF), Class 2 (45,000 AF), and maximizing access to Unreleased Restoration Flows (URF) and all other available CVP supplies.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (SSJMUD-1 through SSJMUD-8, SSJMUD-10, and SSJMUD-11) will come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. As a result, SSJMUD has access to Class 1 water (97,000 AF contract), Class 2 water (45,000 AF contract), and several other types of water through its contract (Unreleased Restoration Flows, Recaptured/Recirculated supplies, Section 215 water, and RWA water). With in-district spreading grounds and its third-party banking program, SSJMUD will be able to fully utilize all flows available through its contract, whereas historically it has been limited to what its growers would use in a given year.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

SSJMUD is a municipal utility district, that possesses the legal authority to implement P/MAs discussed herein. SSJMUD GSA is also a GSAs, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein. SSJMUD is also a GSA for those lands within its boundaries. SSJMUD has entered into SGMA contracts with

certain landowners outside of SSJMUD's water service area that are within the boundary of KNDLA. Pursuant to such SGMA contracts and SSJMUD's membership in KNDLA, SSJMUD has the authority to include these areas outside the SSJMUD service area in its GSA boundaries and otherwise impose P/MAs, including demand management, on the lands that are subject to the contracts. SSJMUD is also a general member of the KNDLA and has entered into an agreement with KNDLA providing SSJMUD the jurisdiction to implement P/MAs, including the demand management P/MAs discussed herein, on those lands outside of the SSJMUD boundary but within the KNDLA boundary where SSJMUD has contracted with the landowner for SGMA purposes. This arrangement is consistent with the intent of the legislature in enacting SGMA, to manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible. (Cal. Water Code § 10720.1(h)).

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for SSJMUD GSA P/MAs by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Southern San Joaquin Municipal Utility GSA	Estimated Costs	
	One-time	Annual
Implemented	$6,810,000	$330,845
Functional	$1,760,000	$6,800
In-Process	$30,627,000	$178,235
As-Needed	$13,475,000	$116,500
Total	**$52,672,000**	**$632,380**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Shafter Wasco Irrigation District GSA

Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

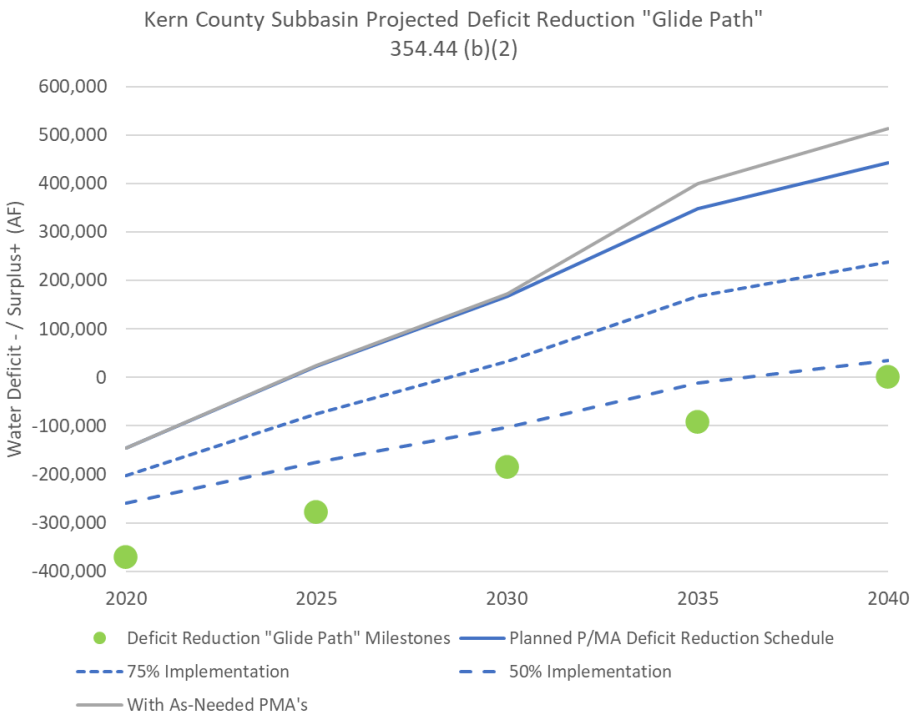


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

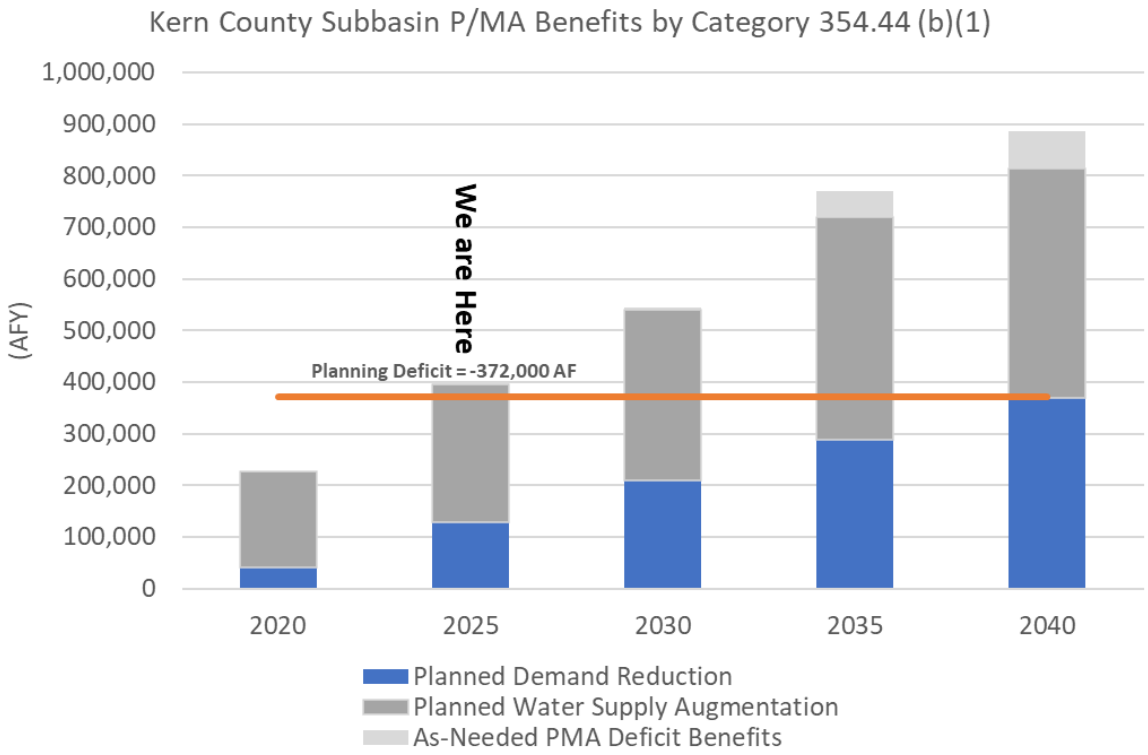


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Shafter Wasco Irrigation District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. For the purpose of this section, SWID GSAs P/MA implementation schedule is separated into two sections: SWID GSA without the 7th Standard Annex (herein referred to as "SWID"), and the 7th Standard Annex (herein referred to as "7th Standard Annex"). When SGMA was passed, SWID annexed in roughly 10,000 acres of un-districted white lands located directly to its South. The water supplies of SWID are not shared with the 7th Standard Annex area – the purpose of the annexation was to provide SGMA coverage, and to provide a vehicle to collect funds from 7th Standard Annex landowners with the intent to use those funds to develop and adopt a GSP and implement P/MA's necessary to reach sustainability. Thus, there is a separate list of P/MAs for the SWID (which holds a contract with USBR for 50,000 AF of Class 1 water and 39,600 AF of Class 2 water through the Friant division), and the 7th Standard Annex (which is almost entirely reliant on groundwater supplies). While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for SWID and 7th Standard Annex in Table 2 and Table 3 below and illustrated on Figure 4. Table 2 and Figure 4 illustrate expected conditions for SWID and Table 3 show conditions for the 7th Standard Annex.

These "Glide Paths" are aimed to address 25 percent of the GSA's projected deficit during each five-year Milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSP Area.

SWID has a minimum P/MA target of 22,489 AFY and the SWID P/MAs presented below have been developed to address this deficit in the five-year milestone periods referenced above. The SWID target deficit reduction in each five-year period is 5,622 AFY. Because the SWID Board of Directors immediately began developing P/MAs in 2015 shortly after SGMA was passed, the anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction for SWID by 2025.

The 7th Standard Annex has a projected deficit of 17,287 AFY. The P/MA implementation schedule for the 7th Standard Annex has been developed to mitigate 25 percent (4,322 AFY) of the projected deficit for this area during each five-year milestone period, thereby eliminating the deficit by 2040.

Table 2. (Glide Path – Target Deficit Reduction, SWID)

Project and Management Action Implementation Schedule (AFY)						
SWID Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-22,190			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-5,548**	**-11,095**	**-16,643**	**-22,190**
Deficit Reduction "Glide Path" Milestones		**-22,190**	**-16,643**	**-11,095**	**-5,548**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	1120	2,405	2,405	2,405	2,405
	Demand Reduction					
	Ag to Urban Conversion	0	1,400	2,800	3,450	4,100
	Water Conservation-Efficiency					
	Subtotal	**1,120**	**3,805**	**5,205**	**5,855**	**6,505**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use					
	Third-Party Banking	0	3,000	3,000	3,000	3,000
	New Local Supply					
	Exercise of Rights	8,162	15,791	20,223	20,223	20,223
	Subtotal	**8,162**	**18,791**	**23,223**	**23,223**	**23,223**
P/MA Implementation Schedule*		**9,282**	**22,596**	**28,428**	**29,078**	**29,728**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**-12,908**	**406**	**6,238**	**6,888**	**7,538**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

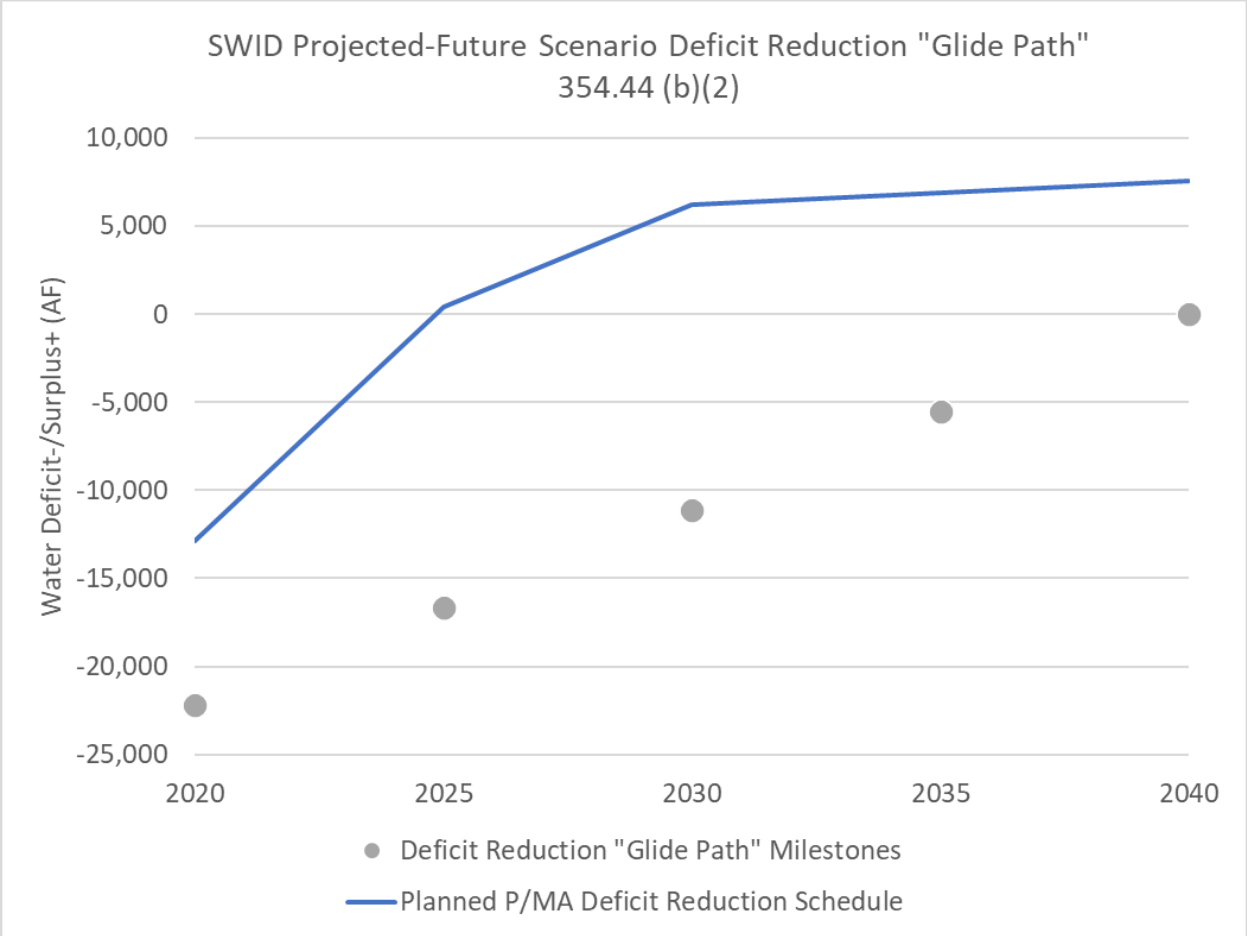


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones, SWID)

Table 3. (Glide Path – Target Deficit Reduction, 7th Standard Annex)

Project and Management Action Implementation Schedule (AFY)						
SWID 7th Standard Annex GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-17,250			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-4,313**	**-8,625**	**-12,938**	**-17,250**
Deficit Reduction "Glide Path" Milestones		**-17,250**	**-12,938**	**-8,625**	**-4,313**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction	0	4,313	8,625	12,938	17,250
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**4,313**	**8,625**	**12,938**	**17,250**
Planned Water Supply Augmentation	Supplemental Water Recharge					
	Supplemental Water Use	0	1,000	2,000	3,000	4,000
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**0**	**1,000**	**2,000**	**3,000**	**4,000**
P/MA Implementation Schedule*		**0**	**5,313**	**10,625**	**15,938**	**21,250**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**-17,250**	**-11,937**	**-6,625**	**-1,312**	**4,000**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

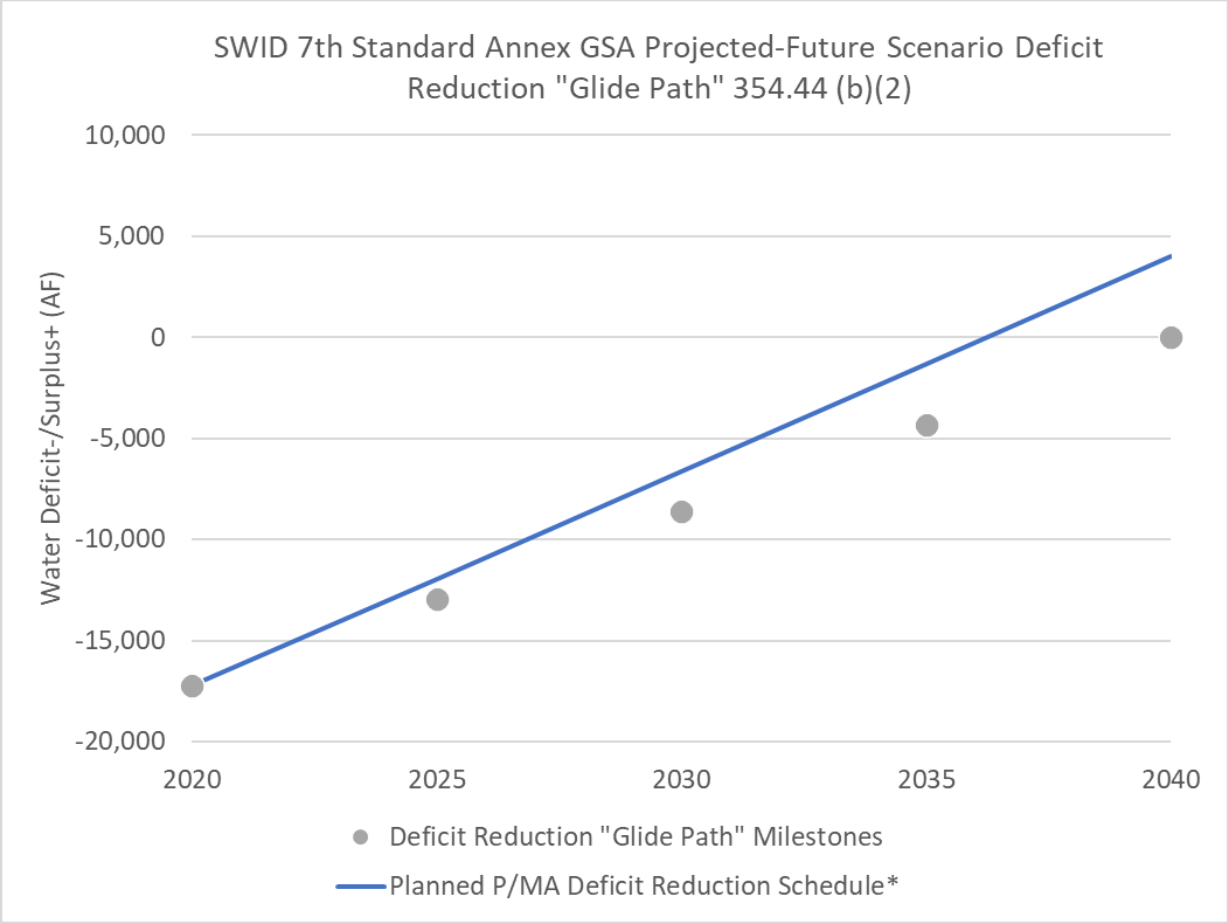


Figure 4. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones, 7th Standard Annex)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example SWID-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 4. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary										
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring				One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed							Implemented				Functional		In-Process					As-Needed					
SWID-1	Kimberlina Recharge Project	Conversion of 280 acres of farmland to recharge basins.	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Complete	NA	NA	Implemented	Complete	Complete	2016-	6,412	998	✓	✓					CVP, Supplemental	None	$11,200,000	$30,000	SJRRP, USBR, District Water Rates
SWID-2	Bell Recharge Project and Pump Station	Conversion of 35 acres of farmland to recharge basins, and a pipeline modification to maximize water deliveries to the project	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Complete	NA	NA	Implemented	Complete	Complete	2019-	1,000	123	✓	✓					CVP, Supplemental	None	$1,400,000	$20,000	USBR, District Water Rates
SWID-3	Farmers Coop and Pipeline	Conversion of 25 acres of farmland to recharge basins, and a pipeline modification to maximize water deliveries to the project	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Complete	NA	NA	Implemented	Complete	Complete	2023-	562	88	✓	✓					CVP	None	$3,125,000	$20,000	USBR, District Water Rates
SWID-4	Grower Recharge and Subsurface Recharge Program	Implementation of policy that encourages landowners to install subsurface recharge systems and/or recharge water on fallowed acreage during wet years.	✓	✓	✓	Supplemental Water Recharge	Complete	NA	NA	Implemented	Complete	Complete	2016-	750	0	✓	✓					CVP	None	$0	$0	NA
SWID-5	Diltz/Leonard Interties with SWSD	Installation of two interties to allow for 2-way movement of water to and from SWSD, to enable both Districts to fully maximize wet year supplies when available.	✓	✓	✓	Utilize Existing Water Rights	Complete	NA	NA	Implemented	Complete	Complete	2015-	0	0			✓				NA	None	$3,000,000	$0	USBR, District Water Rates
SWID-6	Southeast Recharge	Conversion of 35 acres of farmland to recharge basins.	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Completion of Design	Stakeholder Meetings Board Meetings Hearing	CEQA/NEPA	In-Process	Initiated (Purchased, Designed, Grant funding secured)	2024	2024-	787	123	✓	✓					CVP	None	$2,305,000	$20,000	USBR, District Water Rates
SWID-7	Dresser Recharge	Conversion of 112 acres of farmland to recharge basins	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Completion of Design	Stakeholder Meetings Board Meetings Hearing	CEQA/NEPA	In-Process	Initiated (Purchased, Designed)	2025	2025-	2,655	392	✓	✓					CVP, Supplemental	None	$7,600,000	$30,000	USBR, District Water Rates
SWID-8	Poplar Recharge	Conversion of 77 acres of farmland to recharge basins	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Completion of Design	Stakeholder Meetings Board Meetings Hearing	CEQA/NEPA	In-Process	Initiated (Purchased)	2026	2026-	1,732	270	✓	✓					CVP	None	$4,500,000	$30,000	USBR, District Water Rates
SWID-9	Jack Recharge	Conversion of 118 acres of farmland to recharge basins	✓	✓	✓	Supplemental Water Recharge; Land Retirement	Completion of Design	Stakeholder Meetings Board Meetings Hearing	CEQA/NEPA	In-Process	Initiated (PSA Signed)	2026	2026-	2,700	413	✓	✓					CVP	None	$5,000,000	$30,000	USBR, District Water Rates
SWID-10	Southern Calloway Turnout	Installation of a turnout to enable the SWID southern FKC turnout to deliver water to the Calloway, which will feed Poplar, Dresser, Bell, and Jack Recharge. This will enable SWID to maximize the use of those facilities.	✓	✓	✓	Exercise of Rights	Completion of Design	Stakeholder Meetings Board Meetings Hearing	CEQA/NEPA	In-Process	Initiated (Designed, Grant funding secured)	2026	2026-	0	0			✓				NA	None	$2,600,000	$0	USBR, District Water Rates
SWID-11	Improved Water Level Measurement	Installation of a monitoring well at the Kimberlina Recharge facility to ensure that banking operations do not contribute to localized impacts.	✓	✓	✓		Completion of Design	NA	NA	In-Process	Completion of Design	2027	2027-	0	0					✓		NA	None	$500,000	$0	USBR, District Water Rates
KSB-1	Friant-Kern Canal Capacity Mitigation	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	Feasibility Study	NA	2030	2030-	0	0			✓	✓	✓		NA	None	Unknown	Unknown	USBR, District Water Rates

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary								One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring					
Management Actions		Implemented / Functional / In-Process	As-Needed											Implemented		Functional		In-Process		As-Needed						
SWID-12	2:1 Recharge Programs	SWID has signed four 2:1 programs, where partners import 2 AF and SWID returns to them 1 AF at a future year. This will be a water supply benefit for SWID	✓	✓	✓	3rd Party Banking	Complete	None	None	Implemented	Complete	Complete	2023-	3,000	0	✓		✓			CVP, SWP, Supplemental	None	$0	NA	NA
SWID-13	2:1 SLR Program	SWID has historically had access to roughly 1250 AFY in San Luis Reservoir as a result of the SJRRP Restoration Program and more specifically the water management goal. SWID has agreements to begin to double that water through 2:1 exchange programs, and import it into the District. This will be a water supply benefit for SWID.	✓	✓	✓	Exercise of Rights	Complete	None	None	Implemented	Complete	Complete	2023-	2,500	0	✓		✓			San Joaquin River Restoration Program	None	$0	NA	NA
SWID-14	Water Quality Mitigation	The recently signed Water Quality Guidelines of the Friant Kern Canal will give SWIID additional water annually for Reclamation Leaching based on the water quality throughout the year. This will be a water supply benefit for SWID	✓	✓		Exercise of Rights	Complete	None	None	Implemented	Complete	Complete	2024-	500	0	✓		✓			CVP	None	$0	NA	NA
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.		✓			NA	NA	NA	Implemented	NA	2020	2020-	0	0	✓				✓	NA	NA	$0	$25,000	USBR, District Water Rates
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		NA	NA	NA	Implemented	NA	2024	2024-	0	0				✓	✓	NA		$0	$25,000	USBR, District Water Rates
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.	NA	2026	2025-	0	0				✓		NA	NA	$0	$45,000	USBR, District Water Rates
SWID-16	FWA Drought Plan MOU	Execution of a Drought Plan that will reduce the number of "Call on Friant", which have historically decreased the Class 1 Friant Allocation in dry years. Under this Drought Plan MOU, USBR, Exchange Contractors, Friant Contractors and Westside Contractors will work together to bolster dry year supplies	✓	✓	✓	Exercise of Rights	Complete	None	None	Implemented	Complete	Complete	2024-	625		✓		✓			CVP	None	NA	NA	NA
SWID-15	Well Mitigation Policy	SWID will adopt a well mitigation policy that is consistent with basin-wide efforts to mitigate effects from lowering groundwater levels.	✓				Will be implemented with Basin efforts	Outreach	None	In-Process	Completion in 2024 likely	2024	2024-	0	0				✓		NA	None	$0	$45,000	USBR, District Water Rates
KSB-4	Coordination with Basin Study	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		NA	NA	NA	Ongoing	NA	2025	2025-	0	0					✓	NA	NA	$25,000	$0	USBR, District Water Rates

KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	NA	Stakeholder Meetings Board Meetings Hearings	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	USBR, District Water Rates
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	USBR, District Water Rates
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	USBR, District Water Rates
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
SWID-17	**Ag to Urban Conversion**	As the cities expand, they will retire agricultural land and it'll be converted to urban land, with a substantially lower demand for water.	✓	✓		Ag to Urban Conversion	Will be implemented based on Cities of Shafter and Wasco activities	None	None	**In-Process (will be through 2024)**	This is up to the Cities' timeline for implementation	2040	2020-2040 linear increase to 2600 AFY in 2040, 1500 AFY from HSR	**0**	**4,100**	✓		✓			NA	None	$0	NA	NA
SWID-18	**WQ Trend Study/Program Coordination**	Filling data gap on water quality, and the impact of groundwater management activities on the groundwater quality. Also coordinating with WQ Programs (CVSALTS, etc.) if and when impacts occur		✓			Will be implemented	Outreach and Coordination	None	**In-Process**	Will begin implementing shortly	TBD	2020-	**0**	**0**				✓	✓	NA	None	$0	NA	NA
SWID-19	**ET Allocations/Pumping Restrictions/Voluntary Land Fallowing**	If needed, SWID will implement ET allocations, pumping restrictions, and encourage land fallowing to reduce demand if the aforementioned projects are not successful	✓	✓	✓	Demand Reduction	As needed (Other projects Fail)	None	None	**As-Needed**	TBD, will implement if sustainability goals not achieved	TBD	2033-	**0**	**0**			✓				None	$0	NA	NA

PMA Number	PMA Name	Summary Description	Relevant Sustainability Indicators Affected: Groundwater Levels & Storage	Relevant Sustainability Indicators Affected: Groundwater Quality	Relevant Sustainability Indicators Affected: Land Subsidence	Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits: Primary (AFY): Water Supply Augmentation	Expected Benefits: Primary (AFY): Demand Reduction	Expected Benefits: Secondary: Water Quality Improvement	Expected Benefits: Secondary: Flood Control	Expected Benefits: Secondary: Water Management Flexibility / Efficiency	Expected Benefits: Secondary: Mitigation Programs	Expected Benefits: Secondary: Data Gap Filling/ Monitoring	Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs: One-time Costs	Estimated Costs: Ongoing Costs (per year)	Estimated Costs: Potential Funding Source(s)
Projects		**Implemented** / **Functional** / **In-Process**		**As-Needed**									**Implemented**	**Functional**		**In-Process**				**As-Needed**				
7th Stnd Annex-1	**Purchase Supplemental Water Supplies**	7TH Standard Annex collects assessments and will use them to purchase water supplies during wet years for recharge in adjacent Districts, most often in SWID. As these supplies accumulate, they will increase the quantity that can be sustainably pumped in 7th Stnd Annex.	✓	✓	✓	Supplemental Water Use	Availability of Supplemental Supplies	None	None	**Implemented**	Complete	Complete	2020-	TBD	0	✓	✓	✓			CVP, SWP, Supplemental	None	TBD	Unknown	Property Assessments
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	Property Assessments

PMA Number	PMA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary										
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring				One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process				As-Needed						
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	NA
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	NA
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓	✓			When declining groundwater levels impact domestic or small community wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**Initiating Development**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	NA
7th Stnd Annex-3	Well Mitigation Policy	SWID will adopt a well mitigation policy that is consistent with basin-wide efforts to mitigate effects from lowering groundwater levels.	✓				Will be implemented with Basin efforts	Outreach	None	**In-Process**	Completion in 2024 likely	2024							✓			None	$0	NA	NA
KSB-4	Coordination with Basin Study	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	NA
7th Stnd Annex-2	ET Limitations/Water Budget	7th Standard Annex has done rotational fallowing since 2020, and in 2025 will begin implementing a Water Budget that ramps down allowable ET from 3 AF/Acre to 0.57 AF/Acre by 2040, or a higher number if 7th Stnd Annex is successful in purchasing supplies for recharge.	✓	✓	✓	Demand Reduction	Will be implemented	Letter sent to growers	None	**In-Process**	Implementing in 2025 onwards	2025	2025-	**0**	**23,153**	✓		✓			NA	None	$0	NA	NA
KSB-6	White Land Demand Management	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	NA
KSB-7	Well Registry	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	NA
KSB-8	Consumptive-Use Study	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	NA
7th Stnd Annex-4	WQ Trend Study/Program Coordination	Filling data gap on water quality, and the impact of groundwater management activities on the groundwater quality. Also coordinating with WQ Programs (CVSALTS, etc.) if and when impacts occur		✓			Will be implemented	Outreach and Coordination	None	**In-Process**	Will be implemented shortly	TBD							✓	✓		None	$0	NA	NA

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline described above.

P/MAs that have either been implemented or are currently being implemented and contribute to water demand reduction include:

Shafter-Wasco Irrigation District

SWID-1 Kimberlina Recharge Project - Conversion of 285 acres of farmland to recharge basins. This was a demand reduction of 998 AFY that has already been implemented.

SWID-2 Bell Recharge Project and Pump Station - Conversion of 35 acres of farmland to recharge basins, and a pipeline modification to maximize water deliveries to the project. This was a demand reduction of 123 AFY that has already been implemented.

SWID-3 Farmers Coop and Pipeline - Conversion of 25 acres of farmland to recharge basins, and a pipeline modification to maximize water deliveries to the project. This was a demand reduction of 88 AFY that has already been implemented.

SWID-6 Southeast Recharge - Conversion of 35 acres of farmland to recharge basins. This was a demand reduction of 123 AFY that has already been implemented.

SWID-7 Dresser Recharge - Conversion of 112 acres of farmland to recharge basins. This is a demand reduction of 392 AFY that has already been implemented as of 2024.

SWID-8 Poplar Recharge - Conversion of 77 acres of farmland to recharge basins. This was a demand reduction of 270 AFY that took place in 2023.

SWID-9 Jack Recharge - Conversion of 118 acres of farmland to recharge basins. This is a demand reduction of 413 AFY that will take place in 2025.

SWID-17 Ag to Urban Conversion - As the cities expand, they will retire agricultural land and it'll be converted to urban land, with a substantially lower demand for water. High Speed Rail is also building through SWID, and has taken an estimated 250 acres out of production, and will take another 250-500 acres out of production by 2027 (projected 4,100 AFY by 2040, 1500 AFY by High Speed Rail and 2600 AFY by expanding Cities).

7th Standard Annex

7th Standard Annex-2 ET Limitations/Water Budget - 7th Standard Annex has done rotational fallowing since 2020, and in 2025 will begin implementing a Water Budget that ramps down allowable ET from 3 AF/Acre to 0.57 AF/Acre by 2040, or a higher number if 7th Standard Annex is successful in purchasing supplies for recharge. If all other projects are unsuccessful in 7th Standard Annex, this P/MA alone will be sufficient to lead to sustainability.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in Appendix C-2. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of Implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" under the 2030 Climate Change Scenario described above by the January 2040 GSP implementation deadline.

P/MAs that have either been implemented or are currently being implemented and contribute to water supply augmentation include:

Shafter-Wasco Irrigation District

SWID-1 Kimberlina Recharge Project - Conversion of 280 acres of farmland to recharge basins. This will allow SWID to capture 6,412 AFY more water available through its contract. This project came online in 2016.

SWID-2 Bell Recharge Project and Pump Station - Conversion of 35 acres of farmland to recharge basins, and a pipeline modification to maximize water deliveries to the project. This will allow SWID to capture 1,000 AFY more water available through its contract. This project came online in 2019.

SWID-3 Farmers Coop and Pipeline - Conversion of 25 acres of farmland to recharge basins, and a pipeline modification to maximize water deliveries to the project. This will allow SWID to capture 562 AFY more water available through its contract. This project came online in 2020.

SWID-4 Grower Recharge and Subsurface Recharge Program - Implementation of policy that encourages landowners to install subsurface recharge systems and/or

recharge water on fallowed acreage during wet years. This will allow SWID to capture more water available through its contract. This project came online in 2017.

SWID-6 Southeast Recharge - Conversion of 35 acres of farmland to recharge basins. This will allow SWID to capture 787 AFY more water available through its contract. This project will come online in 2024.

SWID-7 Dresser Recharge - Conversion of 112 acres of farmland to recharge basins. This will allow SWID to capture 2,655 AFY more water available through its contract. This project will come online in 2025.

SWID-8 Poplar Recharge - Conversion of 77 acres of farmland to recharge basins. This will allow SWID to capture 1,732 AFY more water available through its contract. This project will come online in 2025.

SWID-9 Jack Recharge - Conversion of 118 acres of farmland to recharge basins. This will allow SWID to capture 2,655 AFY more water available through its contract. This project will come online in 2026.

SWID-12 2:1 Recharge Programs - SWID has signed four 2:1 programs, where partners import 2 AF and SWID returns to them 1 AF at a future year. This will be a water supply benefit for SWID of an estimated 3,000 AFY. These agreements were executed in 2023.

SWID-13 2:1 SLR Program - SWID has historically had access to roughly 1250 AFY in San Luis Reservoir as a result of the SJRRP Restoration Program and more specifically the water management goal. SWID has agreements to begin to double that water through 2:1 exchange programs, and import it into the District. This will be a water supply benefit for SWID. These agreements were executed in 2022.

SWID-14 Water Quality Mitigation - The recently signed Water Quality Guidelines of the Friant Kern Canal will give SWID additional water annually for Reclamation Leaching based on the water quality throughout the year. This will be a water supply benefit for SWID of an estimated 500 AFY and will likely grow in the future as pump-ins increase during drought cycles.

SWID-16 FWA Drought Plan MOU - Execution of a Drought Plan that will reduce the number of "Call on Friant", which have historically decreased the Class 1 Friant Allocation in dry years. Under this Drought Plan MOU, USBR, Exchange Contractors, Friant Contractors and Westside Contractors will work together to bolster dry year supplies.

7th Standard Annex

7th Standard Annex-1 Purchase Supplemental Water Supplies - 7th Standard Annex collects assessments and will use them to purchase water supplies during wet years for recharge in adjacent Districts, most often in SWID. As these supplies accumulate, they will increase the quantity that can be sustainably pumped in 7th Standard Annex.

Operational Improvements

Management Actions that have either been implemented or are currently being implemented and contribute to operational improvements include:

Shafter-Wasco Irrigation District

SWID-5 Diltz/Leonard Interties with SWSD - Installation of two interties to allow for 2-way movement of water to and from SWSD, to enable both Districts to fully maximize wet year supplies when available.

SWID-10 Southern Calloway Turnout - Installation of a turnout to enable the SWID southern FKC turnout to deliver water to the Calloway, which will feed Poplar, Dresser, Bell, and Jack Recharge. This will enable SWID to maximize the use of those facilities.

SWID-11 Improved Water Level Measurement - Installation of a monitoring well at the Kimberlina Recharge facility to ensure that banking operations do not contribute to localized impacts.

SWID-15 Well Mitigation Policy - SWID will adopt a well mitigation policy that is consistent with basin-wide efforts to mitigate effects from lowering groundwater levels.

SWID-18 WQ Trend Study/Program Coordination - Filling data gap on water quality, and the impact of groundwater management activities on the groundwater quality. Also coordinating with WQ Programs (CVSALTS, etc.) if and when impacts occur.

7th Standard Annex

7th Standard Annex-3 Well Mitigation Policy - SWID will adopt a well mitigation policy that is consistent with basin-wide efforts to mitigate effects from lowering groundwater levels.

7th Standard Annex-4 WQ Trend Study/Program Coordination - Filling data gap on water quality, and the impact of groundwater management activities on the groundwater quality. Also coordinating with WQ Programs (CVSALTS, etc) if and when impacts occur.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that “any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results.” Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA

jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans

surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study (see Appendix U). The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting

electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.

c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located

within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by SWID GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact PMA's to accomplish at least a linear path to sustainability. A management action to impose evapotranspiration limits on water users in the SWID GSA has been identified and listed "**As Needed**" on Table 4 to provide further water demand reduction in the future, if needed. The 7th Standard Annex already has a landowner-level demand reduction program that is in place; however, SWID does not currently have a landowner-level demand reduction plan, since it appears that through its P/MAs it will reach sustainability well ahead of the 2040 deadline. If for any reason, SWID's planned demand reduction and supply augmentation projects are unsuccessful, and in the year 2033 SWID still has a historical

10-year average deficit, SWID will implement SWID-19 P/MA which is landowner-level ET allocations, pumping restrictions, and encourage land fallowing to reduce demand and reach sustainability.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 4 as: **Implemented**, **Functional**, **In-Process**, or **As-Needed.**

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review.

Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ **23 CCR § 354.44(b)(2)**

As discussed in **Section 9**, **Appendix N**, SWID (The portion of SWID GSA excluding the 7th Standard Annex) has a Pre-SGMA net water budget deficit of 22,489 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, SWID has a diminished deficit of water with a negative water budget in the amount of 13,041 AFY, due to the implementation of its recharge projects and demand reduction, enabling SWID to capture more water available through its contract with the US Bureau of Reclamation. As the 2015 drought year comes off the average, and the 2024 water year comes on, the deficit in this 9-year period is further reduced to *less than 1,500 AFY*. It should be noted that this is less than the 4,400 AFY deficit that is a result of the demand of the Cities of Shafter and Wasco, who are fully reliant on groundwater. *This means that at the end of 2024, SWID has effectively reduced its deficit by over 90%*. This progression of SWID's water budget reduction is consistent with the implementation schedule laid out in Appendix S, and it shows that SWID is on track to have a sustainable water budget before 2030, and well before Undesirable Results occur.

7th Standard Annex has a net water budget deficit of 17,287 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. For the Post-SGMA period between 2015 and 2023, 7th Standard Annex's deficit is reduced to 16,377 AFY through voluntary land fallowing programs. It should be noted the 7th Standard Annex does not have a significant surface water supply. The primary management action begins in 2025, where each landowner will have a water budget, and the full deficit of 17,287 AFY will be reduced to 0 AFY by 2040, avoiding undesirable results in the process. 7th Standard Annex intends to purchase water supplies when they are available for recharge, but the Demand Reduction Management Action plans for the worst-case scenario where no additional water supplies are secured.

In summation, SWID GSA (combining SWID and 7th Standard) has an assured path to sustainability while avoiding Undesirable Results.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, Caltrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2 and Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit will be quantified directly through flow measurement. For P/MAs that involve indirect supply augmentation through increased groundwater storage or banking, quantification of the benefit will require tracking of project water deliveries and estimates of indirect supply increases based on specific project conditions. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against the recent historical and projected condition without the P/MA in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies for water supply augmentation P/MAs (SWID-1, SWID-2, SWID-3, SWID-4, SWID-6, SWID-7, SWID-8, SWID-9, SWID-12, SWID-13, SWID-14, and SWID-16) could come from the following sources:

Central Valley Project

SWID (excluding the 7th Standard Annex Area) is a Friant Contractor, and thusly receives water through the Central Valley Project (CVP), which is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. As a result, SWID has access to Class 1 water (50,000 AF contract), Class 2 water (39,600 AF contract), and several other types of water through its contract (Unreleased Restoration Flows, Recaptured/Recirculated supplies, Section 215 water, and RWA water). In addition to this, SWID's recharge facilities are located off the Calloway Canal, which connects to the Cross Valley Canal, which means that SWID is able to receive water from the California Aqueduct, Cross Valley Canal, Friant Kern Canal, and the Kern River system, if SWID is able to execute purchases or exchanges for the water supplies it doesn't have access to through its contract. With its additional recharge, SWID will be able to fully utilize all flows available to it through its contract, whereas historically it has been limited to what its growers would use in a given year. The 7th Standard Annex has no major surface water supply, and does not share in SWID's surface water supplies. Its only source of surface water supply is a small amount of recycled water it uses for irrigation in areas of the District.

Exchange Agreements

SWID has a history of participating in exchange agreements with parties within and outside the Subbasin. Over the last several years, there has been increased interest and SWID has executed five 2:1 exchange agreements which provide additional water supply for P/MAs and localized water supply benefits.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The SWID is an irrigation district that possesses the legal authority to implement P/MAs discussed herein. SWID GSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on

the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of “one-time” costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 4, and include the following:

- Property assessments and/or SWID water charges.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and SJRRP.

Estimated costs for P/MAs by implementation status for SWID and for the 7th Standard Annex alone are summarized in Table 5 and Table 6, respectively. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 5. (P/MA Cost by Implementation Status, SWID GSA excluding 7th Standard Annex)

Shafter-Wasco Irrigation District GSA	Estimated Costs	
	One-time	Annual
Implemented	$18,725,000	$165,000
Functional		
In-Process	$22,530,000	$215,000
As-Needed		
Total	**$41,255,000**	**$380,000**

Table 6. (P/MA Cost by Implementation Status, 7th Standard Annex)

7th Standard SWID	Estimated Costs	
	One-time	Annual
Implemented	$0	$95,000
Functional		
In-Process	$25,000	$60,000
As-Needed		
Total	**$25,000**	**$155,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As stated previously in **Section 9** ***Water Budget Information***, under historical conditions (WY 2010 – 2019) the SWID GSA is in a state of approximate water supply/demand deficit (i.e., a small net shortfall based on the "checkbook" water budget planning tool). Under the projected Baseline and 2030 (and 2070) Climate Change Scenarios, however, a net water supply deficit is projected to continue within the GSP area. However, as discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. Through this combination of increased recharge during wet years and demand reduction, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Semitropic Water Storage District GSA

Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage "deficit" of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address

25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

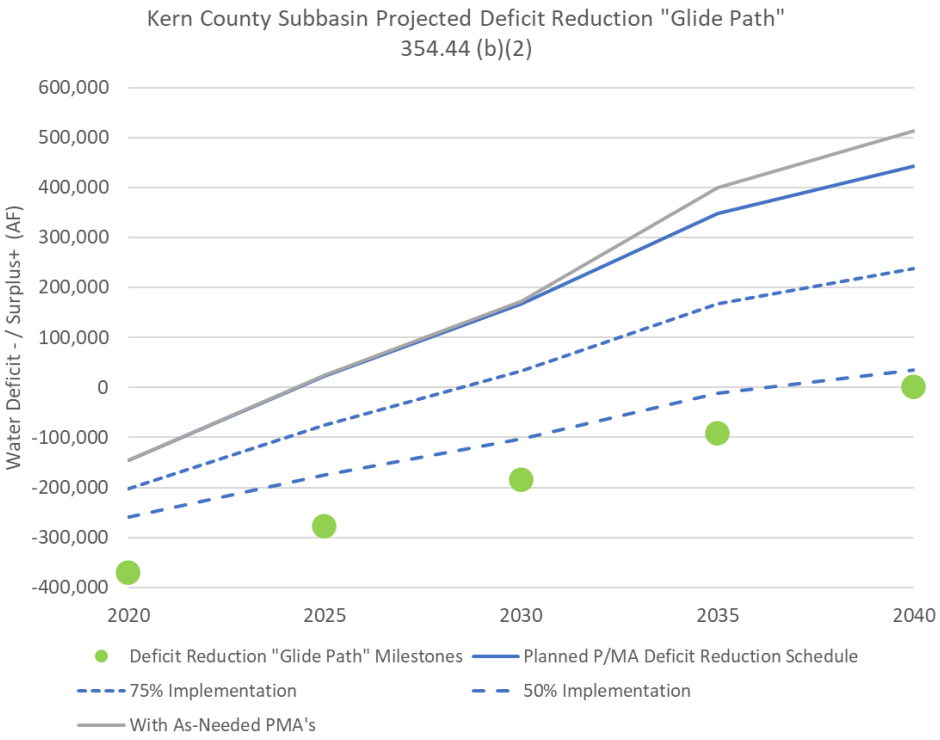


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

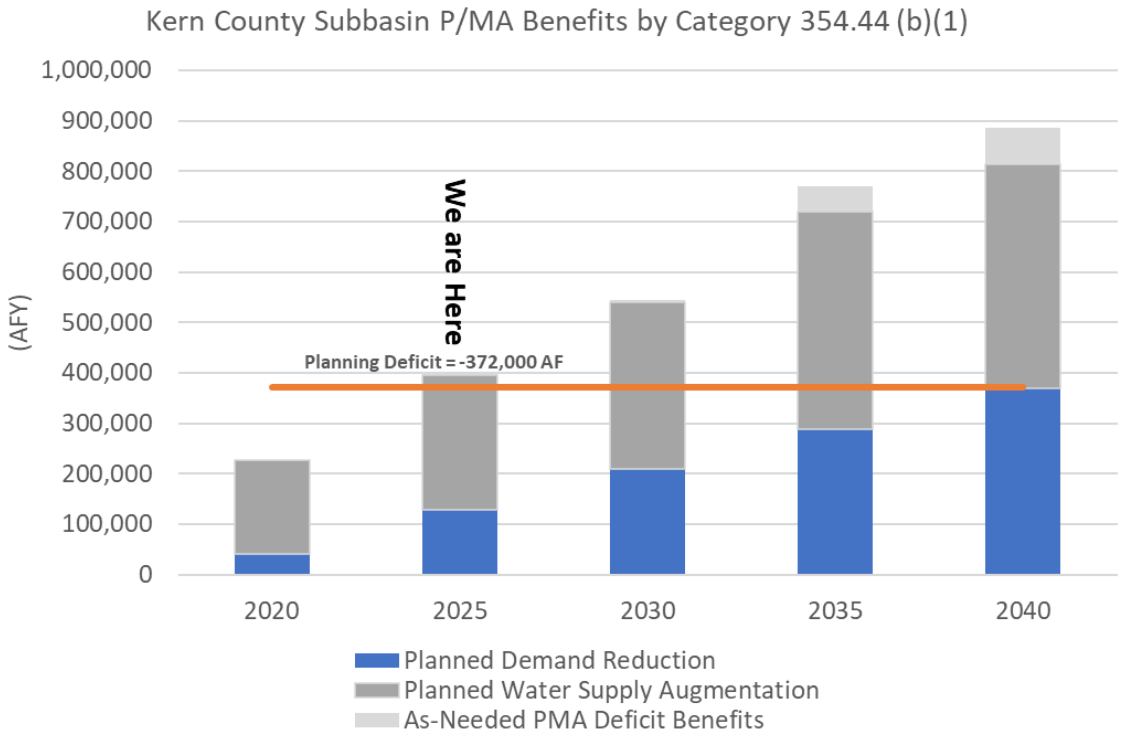


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Semitropic Water Storage District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for SWSD GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (40,735 AFY) of the projected deficit of 162,940 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2033.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
SWSD GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-162,940			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-40,735**	**-81,470**	**-122,205**	**-162,940**
Deficit Reduction "Glide Path" Milestones		**-162,940**	**-122,205**	**-81,470**	**-40,735**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	0	0	0	0	0
	Demand Reduction	0	40,668	81,337	122,005	162,673
	Ag to Urban Conversion	0	0	0	0	0
	Water Conservation-Efficiency	0	0	0	0	0
	Subtotal	**0**	**40,668**	**81,337**	**122,005**	**162,673**
Planned Water Supply Augmentation	Supplemental Water Recharge	0	0	0	0	0
	Supplemental Water Use	19,000	19,000	19,000	19,000	20,800
	Third-Party Banking	0	0	0	0	0
	New Local Supply	0	0	0	35,000	35,000
	Exercise of Rights	2,800	2,800	2,800	2,800	2,800
	Subtotal	**21,800**	**21,800**	**21,800**	**56,800**	**58,600**
P/MA Implementation Schedule*		**21,800**	**62,468**	**103,137**	**178,805**	**221,273**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**-141,140**	**-100,472**	**-59,803**	**15,865**	**58,333**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

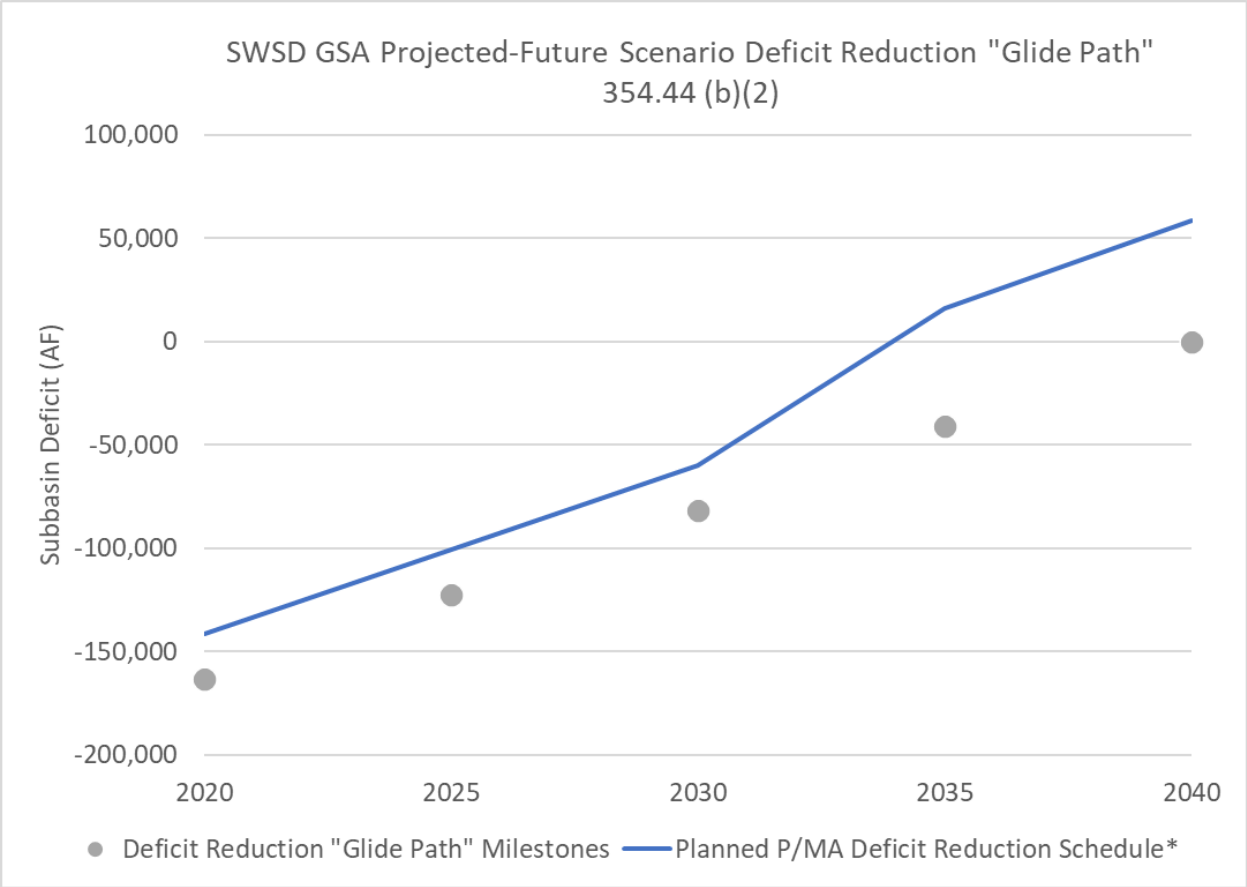


Figure 3. P/MA-5 (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example SWSD-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MA)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional	In-Process				As-Needed						
SWSD-1	Monitoring Network Improvement Plan	Assess and identify monitoring network requirements for full compliance with SGMA and development of an implementation plan for achieving full compliance. Additional wells leverage existing network of monitoring wells.	✓	✓	✓		Upon approval by SWSD BOD	Semitropic GSA Board Meetings & Website	Site specific (CEQA)	**Implemented**	Complete	Complete	2023-	**0**	**0**					✓		District authorities	$10,000	$0	District
SWSD-2	Leonard Avenue System	Conveyance capacity to support delivery of surface water for groundwater recharge. Interconnection with Shafter-Wasco Irrigation District.	✓		✓		Complete	Semitropic GSA Board Meetings & Website	CEQA	**Implemented**	Complete	Complete	2023-	**0**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$16,100,000	$0	District
SWSD-3	Diltz Intertie	Conveyance capacity to support delivery of surface water for groundwater recharge. Interconnection with Shafter-Wasco Irrigation District.	✓		✓		Complete	Semitropic GSA Board Meetings & Website	CEQA	**Implemented**	Complete	Complete	2020-	**0**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$3,200,000	$0	District
SWSD-4	Cox Canal Pump Station	Conveyance capacity to support delivery of surface water for groundwater recharge. Interconnection with Buena Vista Water Storage District.	✓		✓		Complete	Semitropic GSA Board Meetings & Website	CEQA	**Implemented**	Complete	Complete	2022-	**0**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$3,600,000	$0	District
SWSD-5	Water Market Acquisitions	Increased participation in state-wide water markets for spot market and long-term water transfers. And maximize acquisition of wet year water supplies for recharge.	✓		✓	Supplemental Water Supplies	Upon approval by SWSD BOD	Semitropic GSA Board Meetings & Website	CEQA / DWR	**Implemented/ Ongoing**	NA	On-going	2020-	**19,000**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$0	$9,500,000	District
SWSD-6	Stored Water Recovery Unit-XYZ	Development of water storage to expand in-lieu service areas.	✓		✓	Exercise of Rights	Upon approval by SWSD BOD and identification of funding	Semitropic GSA Board Meetings & Website	None	**Completed**	Current	2018	2022-	**0**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$17,000,000	$0	District
SWSD-7	Pond-Poso Spreading Grounds, Phase II	Development of spreading facilities to increase groundwater recharge capacity.	✓		✓	Supplemental Water Recharge	Upon approval by SWSD BOD and identification of funding	Semitropic GSA Board Meetings & Website	CEQA	**Construction**	Current	2025	2025-	**0**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$32,000,000	$0	District
SWSD-8	Schuster Spreading Grounds	Development of spreading facilities to increase groundwater recharge capacity.	✓		✓	Supplemental Water Recharge	Upon approval by SWSD BOD and identification of funding	Semitropic GSA Board Meetings & Website	CEQA	**Design**	Current	2026	2026-	**0**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	$1,200,000	$0	District
SWSD-9	Poso Creek MAR	Development of floodwater capture and recharge program from Poso Creek flood flows.	✓		✓	Supplemental Water Recharge	Upon completion of feasibility and permitting requirements	Semitropic GSA Board Meetings & Website	CEQA	**Feasibility**	Current	2028	2028-	**2800**	**0**		✓	✓			Poso Creek & Friant-215	District authorities	$17,700,000	$0	District
SWSD-10	Pond-Poso Entrance Ponds	Development of spreading facilities to increase groundwater recharge capacity.	✓		✓	Supplemental Water Recharge	Upon approval by SWSD BOD and identification of funding	Semitropic GSA Board Meetings & Website	CEQA	**Design**	Current	2028	2028	**0**	**0**	✓	✓	✓			Poso Creek & Friant-215	District authorities	$8,000,000	$0	District

KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	District
SWSD-11	**Tulare Lake Project**	Development of conveyance facilities to divert Kings River flood flows for direct use and recharge in the SWSD.	✓	✓	✓	Supplemental Water Recharge	Upon completion of water rights determination	Semitropic GSA Board Meetings & Website	CEQA / State Board / Regulatory	**Feasibility/ Water Rights**	Current	2035	2035-	**35000**	**0**	✓	✓	✓			Kings River flood flows	District authorities	$270,000,000	$1,000,000	District
SWSD-12	**Enhanced Groundwater Recharge**	Development of surface and subsurface recharge projects underlying developed agricultural lands to increase groundwater recharge capacity.	✓			Exercise of Rights/ Supplemental Water Recharge	Upon approval by SWSD BOD and identification of funding	Semitropic GSA Board Meetings & Website	Site Specific (CEQA)	**In-Process**	Current	2040	2020-	**0**	**0**	✓		✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District authorities	TBD	$25,000	District
SWSD-13	**Evaluation and Assessment of GDEs within the Semitropic Area**	Conduct additional analysis to verify the presence and extend of GDE's in the Semitropic and, if present, develop appropriate monitoring protocols.	✓				As needed	Semitropic GSA Board Meetings & Website	TBD	**As needed**	Current	2030	2030-	**0**	**0**					✓		District authorities	$50,000	bank	District
SWSD-14	**Brackish Water Desalination**	Development of a brackish water treatment facility to treat locally sourced brackish water for District use.	✓			New Local Supply	Upon completion of environmental and regulatory requirements As needed	Semitropic GSA Board Meetings & Website	CEQA	**As needed**	Current	2040	2040-	**1,800**	**0**	✓		✓			Local brackish water	District authorities	$0	$900,000	District
SWSD-15	**In-District Water Markets and Transfers**	District will allow for the development of market for in-district transfers.	✓			Exercise of Rights Supplemental Water Use	As needed	Semitropic GSA Board Meetings & Website	TBD	**As needed**	As needed	2040	2040-	**TBD**	**0**			✓			SWP, Friant, Kern River, CVP and other imported and local sources.	District / SGMA authorities	TBD	$25,000	District

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		**Implemented** / **Functional** / **In-Process**		**As-Needed**									**Implemented**		**Functional**		**In-Process**			**As-Needed**					
SWSD-16	**Landowner Water Budgets**	Establish individual water budgets for landowners by landowner classes. Implemented to reduce District's demand to	✓	✓	✓	Demand Reduction	Establish water budgets by landowner	Semitropic GSA Board Meetings & Website	CEQA	**Implemented**	Complete	Complete	2017	**0**	**132,000**			✓	✓		NA	District / SGMA authorities	$0	$250,000	District
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	District
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	District

KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	Cawelo Water District (Assessments) CGSA Landowners
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	District
SWSD-17	**Tiered Pricing for Groundwater Pumping**	Develop pricing structure to incentivize groundwater users to manage groundwater extractions to SWSD-16 landowner budgets.	✓	✓	✓	Demand Reduction	Implementation of SWSD-16	Semitropic GSA Board Meetings & Website	218 Process	**Ongoing**	Current	2025	2025-	**0**	**33,000**			✓	✓		NA	District / SGMA authorities	$100,000	$25,000	District
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	District
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	District
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
SWSD-18	**District Fallowing Program**	Support land fallowing as a District action and by individual landowners or groups of landowners.	✓	✓	✓	Demand Reduction	Implementation of SWSD-16	Semitropic GSA and District Board CEQA compliant process	CEQA	**As needed**	Current	2040	2040-	**0**	**TBD**			✓	✓			District authorities	TDB	$0	District

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in eliminating the currently identified "deficit" of 162,940 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline. Demand reduction is primary action being implemented by the SWSD GSA to eliminate the identified deficit.

GSA-specific P/MAs that have either been implemented or are currently being implemented or in-process and contribute to water demand reduction include:

SWSD-16 Landowner Water Budgets – The SWSD GSP includes SWSD-16 Landowner Water Budgets as the principal Management Action to achieve sustainability. SWSD-16 Landowner Water Budgets established individual water budgets for landowners by landowner classes to reduce SWSD's demand to available surface water considering effective precipitation and the Native Yield which is currently assumed to be 0.15 acre-feet per acre The Program consists of surface water and groundwater supplies of the SWSD allocated to each unique parcel according to their Land Class and/or the SWSD's Project as funded by the General Project Service Charge (GPSC) and special GPSC. The Program includes a Temporary Consumptive-Use Allowance (TCA) for each parcel consisting of a temporary water supply allocation to meet the consumptive use of irrigated crops or managed habitats. The TCA will be incrementally reduced each year until 2040, when the TCA will be zero for all parcels such that the aggregate consumptive use of the remaining irrigated crops and management habitat will equal the sustainable water supply of the SWSD.

Beginning in 2022, SWSD allocated the total water supply of SWSD to each landowner based on their land class and level of contractual agreement with SWSD for either SWP supplies or the GPSC to meet the consumptive use or crop evapotranspiration of their properties. All parcels or portions of parcels within the SWSD GSA can be categorized into four categories depending on their level of contractual participation in the SWSD water supply programs and land use practices. The water budgets developed for each landowner define the required reduction in consumptive water demand and associated groundwater extractions necessary to balance SWSD's total water budget and eliminate local overdraft within the boundaries of the SWSD GSA. Landowner Water Budgets were delivered to all landowners in 2021 and became effective in 2022. While water budgets, per SWSD-16, became effective in 2022, SWSD has been working with landowners since 2015.

SWSD-17 Tiered Pricing for Groundwater Pumping – SWSD GSA is developing the tier pricing structure identified as Management Action SWSD-17 Tiered Pricing for Groundwater Pumping to incentivize groundwater users to manage their respective water demand as provided in the SWSD-16 Landowner Water Budgets. SWSD-17

reinforces the adherence to SWSD-16 Landowner Water Budgets and provides funding for other projects and management actions, including a Domestic Well Mitigation Program (Management Action KSB-5). The tiered pricing structure creates a rate structure such that if a landowner's consumptive use (Et) includes the use of their TCA or exceeds their annual Total Consumptive Use Water Budget, as provided in the SWSD-16 Landowner Water Budgets, then fees would be charged to incentivize adherence to the water budgets and such fees would be used by the SWSD GSA to mitigate potential impacts to domestic wells in the GSA and to fund project and management actions including the acquisition of supplemental water supplies.

This tiered water rate structure has been developed in coordination with the Tiered Water Rate Structure technical memorandum developed by GEI Consultants (April 2022) with the support of M.Cubed, an economic consultant retained to develop recommendations for proposed tiered rates. This tiered structure allocates the tiered rates developed by M.Cubed relative to the magnitude of a water budget exceedance in relation to a landowner's Total Consumptive Use Budget for the calendar year.

However, it is the intent of the SWSD GSA to work with its landowners to continue to develop new and enhanced supplemental water supply projects, and to the extent possible, maintain as many irrigated acres within the SWSD GSA as economically viable. As needed, the SWSD GSA will initiate environmental and regulatory compliance efforts for other projects and management actions that enhance SWSD's supplemental water supplies.

The implementation of SWSD 16 and 17 are the primary management actions undertaken by the SWSD GSA to achieve sustainability.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in providing supplemental water above that needed to eliminate the "deficit" of 162,940 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs that have either been implemented or are currently being implemented or in-process and contribute to water demand reduction include:

SWSD-5 Water Market Acquisitions – Increased participation in state-wide water markets for spot market and long-term water transfers and maximize acquisition of wet year water supplies for recharge.

SWSD-11 Tulare Lake Project – Development of conveyance facilities to divert Kings River flood flows for direct use and recharge in the SWSD.

SWSD-12 Enhanced Groundwater Recharge – Development of surface water and subsurface water recharge projects underlying developed agricultural lands to increase groundwater recharge capacity.

Additionally, the SWSD GSA is implementing the following projects to improve operational efficiencies and water management flexibility.

SWSD-2 Leonard Avenue System – Conveyance capacity to support delivery of surface water for groundwater recharge. Interconnection with Shafter-Wasco Irrigation District.

SWSD-3 Diltz Intertie – Conveyance to support delivery of surface water for groundwater recharge. Interconnection with Shafter-Wasco Irrigation District.

SWSD-4 Cox Canal Pump Station – Conveyance capacity to support delivery of surface water for groundwater recharge. Interconnection with Buena Vista Water Storage District.

SWSD-6 Stored Water Recovery Unity-XYZ – Development of water storage to expand in-lieu service areas.

SWSD-7 Pond-Poso Spreading Grounds, Phase II – Development of spreading facilities to increase groundwater recharge capacity.

SWSD-8 Shuster Spreading Grounds – Development of spreading facilities to increase groundwater recharge capacity.

SWSD-9 Poso Creek Flood MAR – Development of floodwater capture and recharge program from Poso Creek flood flows.

SWSD-10 Pond-Poso Entrance Ponds – Development of floodwater capture and recharge program from Poso Creek flood flows.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that “any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results.” Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is

proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

- SWSD-1 Monitoring Network Improvement Plan – Assess and identify monitoring network requirements for full compliance with SGMA and development of an implementation plan for achieving full compliance. Additional wells leverage existing network of monitoring wells.
- KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums

of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting

electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.

c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located

within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by SWSD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The SWSD GSA will enact projects and actions to accomplish at least a linear path to sustainability. Several PM/As have been identified and listed "As Needed" on Table 4 and could reduce the deficit by up to 1,800 AFY or more if needed as summarized below.

SWSD-12 Evaluation and Assessment of GDEs within the Semitropic Area – Conduct additional analysis to verify the presence and extent of GDEs in the Semitropic area and, if present, develop appropriate monitoring protocols.

SWSD-14 Brackish Water Desalination – Development of a brackish water treatment facility to treat locally sourced brackish water for SWSD use.

SWSD-15 In-District Water Markets and Transfers – SWSD will allow for the development of market for in-district transfers.

SWSD-18 District Fallowing Program – The intent of SWSD-18 District Fallowing Program is to support the fallowing of up to 39,000 acres over the 20-year SGMA implementation period. The SWSD GSA land fallowing program supports land fallowing as an SWSD GSA action, and action by an individual landowner, groups of landowners, or a combination thereof. An objective of the program is a reduction in consumptive use required to reduce or eliminate SWSD GSA's estimated water budget deficit of approximately 136,040 AFY. If achieved through land fallowing alone, this would result in the fallowing of between 32,650 and 44,250 acres of irrigated lands, if no additional water supplies can be developed to offset this deficit. The range of potentially fallowed lands is based on a range of per acre consumptive use (measured as crop evapotranspiration (Et)) of 3.8 to 2.8 acre-feet per acre of currently irrigated lands.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished

P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting processes that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the SWSD GSA has a Pre-SGMA net water budget deficit of 162,940 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the SWSD GSA's deficit was 196,260 AFY for this historical period due to persistent drought conditions and limited SWP supply availability, SWSD primary surface supply. As described above, demand management is the primary action by SWSD to eliminate its portion of the Subbasin's deficit. The SWSD GSA began implementing demand reduction actions in 2016. For the period 2017 to 2024 the SWSD GSA has reduced its total irrigated acres by approximately 14,400 acres and from 2017 to 2023 crop evapotranspiration has been reduced by approximately 35,800 acre-feet (see Appendix N and supplemental SWSD Blue Pages)

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the “Glide Path” level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the “Glide Path”), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (SWSD-2, SWSD-3, SWSD-4, SWSD-5, SWSD-6, SWSD-7, SWSD-8, SWSD-9, SWSD-10, SWSD-11, SWSD-15) could come from the following sources:

State Water Project

The primary source of imported water to SWSD is supplied by the State Water Project (SWP), which is conveyed through the California Aqueduct, transporting water from the Sacramento-San Joaquin Delta along the west side of the San Joaquin Valley to Kern County. The SWSD holds a contract with the Kern County Water Agency (KCWA) for a share of the imported water conveyed by the SWP. Due to recent regulatory and judicial decisions, hydrologic conditions, and reservoir storage, the SWP is not able to deliver full amounts of the 155,000 AFY of Table A contracted water to SWSD in most years. Additionally, during hydrologically wet years, DWR may declare Article 21 water available, allowing for the diversion of uncontrolled water that cannot be stored in State reservoirs. SWSD purchases Article 21 water through its state water contract and

recharges it in existing recharge facilities for later use during drought or dry years when surface water is scarce.

Supplemental SWSD Supplies

In addition to SWP water, SWSD is also within the Federal place of use and is eligible to receive waters from the Federal projects. SWSD occasionally receives Section 215 floodwater from the Central Valley Project (CVP). Furthermore, SWSD may also receive Kern River water via interconnections with adjoining districts and by way of its participation in the Pioneer and Kern Water Bank projects located within the Kern Fan. Other sources of supplemental SWSD supplies include dry year transfers, other water purchases, and leave behind from third party banking operations in which SWSD banks water in their recharge facilities on behalf of its neighbors for a leave behind credit.

Poso Creek

Poso Creek is the main natural surface water body flowing into SWSD, which originates in the Sierra Nevada and only provides surface water in very wet years. West of Central Avenue, Poso Creek Flood Channel was built to control flood events. Diversions off Poso Creek are governed by an agreement between North Kern Water Storage District, Cawelo Water District, and Semitropic, who share flood flow runoff from the creek. Under the agreement, riparian users have first right to the water. Once these are satisfied, the water is shared among the three agencies in accordance with the established guidelines based on flow measured in Poso Creek at Highway 65. SWSD may divert floodwater for flows between 300 cfs and 685 cfs.

Kings River

The Tulare Lake Project aims to contribute to the long-term, reliably water supply for SWSD and its landowners. The proposed project would capture floodwater from the South Fork of the Kings River and possibly other Tulare Lake tributaries and deliver captured surface water to SWSD and other places of use. Project water may be stored in the SWSD's groundwater banking facilities or other banking facilities outside of SWSD that are accessible by the California Aqueduct and/or other water conveyance facilities accessible by SWSD. Water captured and stored by the project would be pumped by SWSD landowners or transferred by direct delivery or exchange for use on existing irrigated lands. The proposed project assumes the diversion of 1,200 cfs of Kings River floodwaters at Empire Weir No. 2 into the South Fork Canal and Blakeley Canal, conveyance of 100 cfs via the Blakeley Canal into storage in the Kettleman Reservoir, conveyance of 1,200 cfs of water via the South Fork Canal and proposed Kettleman Canal to the Aqueduct, and an Aqueduct Intertie facility and ancillary project facilities, including an electrical switchyard and substation and a maintenance yard. SWSD is currently waiting on determination of water rights for project implementation. If approved, the proposed project is estimated to provide 35,000 AFY.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

For the SWSD GSA, most of the groundwater banking recharge and storage projects do not provide a direct supply augmentation benefit but instead provide the means to realize benefits of water market acquisitions and purchases.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The SWSD is a water storage district, that possesses the legal authority to implement P/MAs discussed herein. SWSD GSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein. SWSD is also a GSA for those lands within its boundaries. SWSD has entered into SGMA contracts with certain landowners outside of SWSD's water service area that are within the boundary of KNDLA. Pursuant to such SGMA contracts and SWSD's membership in KNDLA, SWSD has the authority to include these areas outside the SWSD service area in its GSA boundaries and otherwise impose P/MAs, including demand management, on the lands that are subject to the contracts. SWSD is also a general member of the KNDLA and has entered into an agreement with KNDLA providing SWSD the jurisdiction to implement P/MAs, including the demand management P/MAs discussed herein, on those lands outside of the SWSD boundary but within the KNDLA boundary where SWSD has contracted with the landowner for SGMA purposes. This arrangement is consistent with the intent of the legislature in enacting SGMA, to manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible. (Cal. Water Code § 10720.1(h)).

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR and United States Bureau of Reclamation (USBR).

Estimated costs for SWSD GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Semitropic Water Storage District GSA	Estimated Costs	
	One-time	Annual
Implemented	$22,910,000	$9,845,000
Functional		
In-Process	$346,025,000	$1,100,000
As-Needed	$50,000	$925,000
Total	**$368,985,000**	**$11,870,000**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, the primary means by which SWSD GSA's deficit will be addressed is through implementing demand reduction P/MAs. Additional supplemental water will also be developed to augment supplies from additional outside sources of water, in particular during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be under those conditions. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

Tejon-Castac Water District GSA

Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address

25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

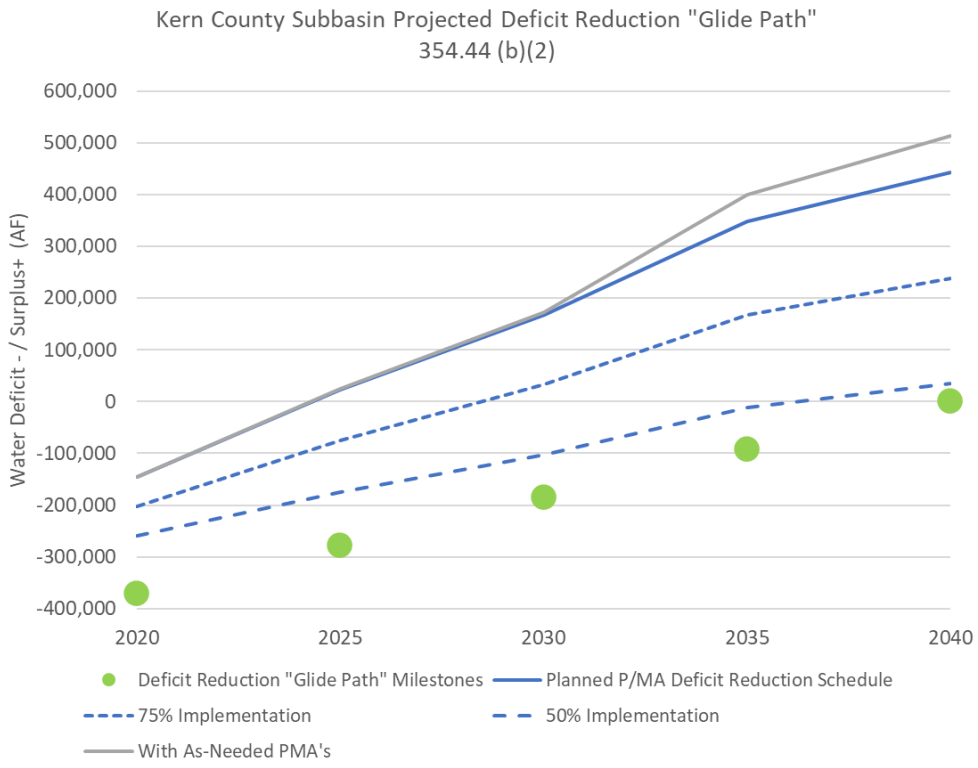


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

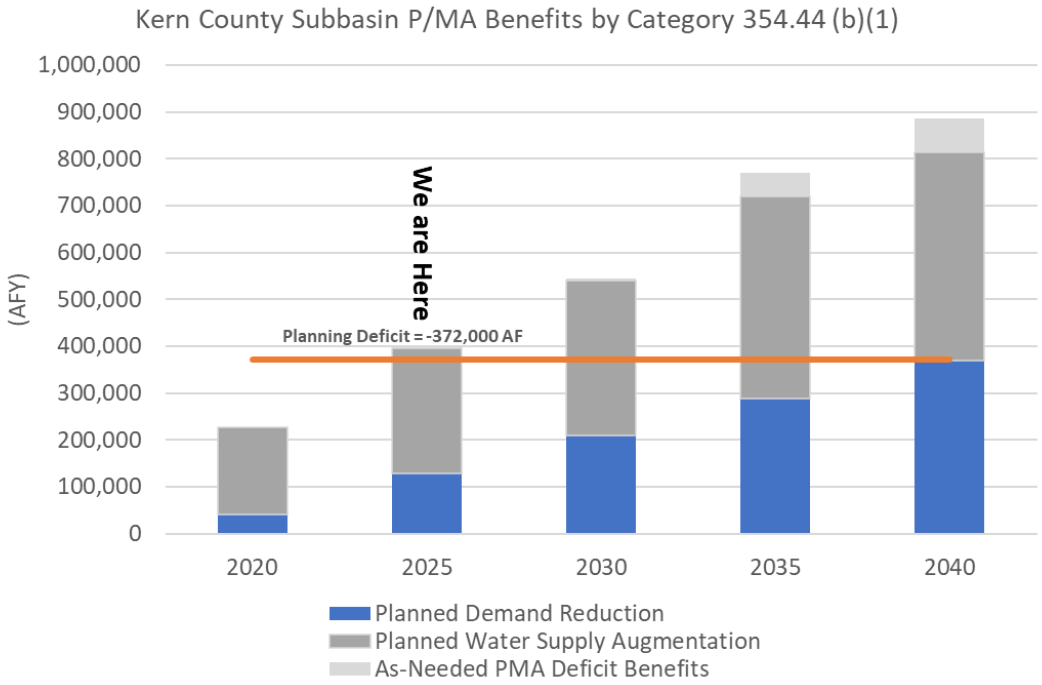


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Tejon-Castac Water District GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Tejon-Castac Water District (TCWD) GSA Table 2 below and illustrated on Figure 3. TCWD GSA is not currently in a deficit and therefore no target deficit reduction is planned through 2040; however, TCWD GSA has initiated two P/MAs which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
TCWD GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement					
	Demand Reduction					
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**0**	**0**	**0**	**0**
Planned Water Supply Augmentation	Supplemental Water Recharge	300	300	1,800	1,800	1,800
	Supplemental Water Use					
	Third-Party Banking					
	New Local Supply					
	Exercise of Rights					
	Subtotal	**300**	**300**	**1,800**	**1,800**	**1,800**
P/MA Implementation Schedule*		**300**	**300**	**1,800**	**1,800**	**1,800**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**300**	**300**	**1,800**	**1,800**	**1,800**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

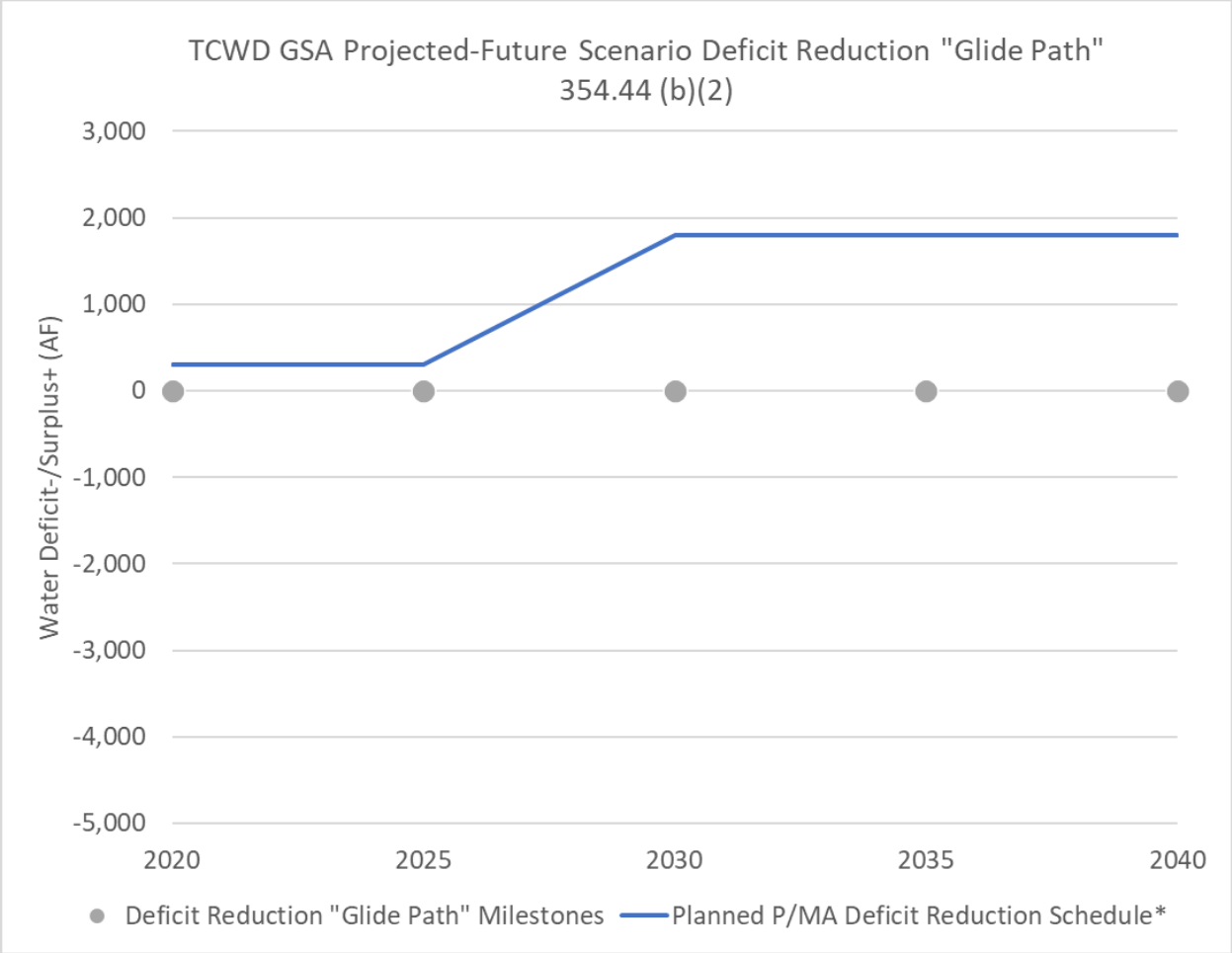


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example TC-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed					
TC-1	**Recharge of Carrot Wash Water**	Tejon Ranch Company (TRC) recharges carrot wash water generated at a nearby carrot processing facility to a 75.5-acre parcel located just outside of the Tejon-Castac Management Area (Township 32S Range 30E Section 6). The site, which has been in operation since 2016, receives carrot wash water from a nearby carrot processing facility which is discharged to a set of recharge ponds. A total of over 1,000 AF has been recharged at these ponds between 2016 and early 2019. This project is anticipated to continue in the future, and results in a local recharge benefit. A production well may be installed in the future at the site to allow for recovery of recharged groundwater.	✓			Supplemental Water Recharge	Underway	NA	WDR No. 5-01-22; well construction permit from Kern County	**Complete; new recovery well may be constructed in the future.**	Complete	2016	2016-	**300**	**0**	✓		✓			Carrot wash water from processing facility	None	$4,500	$0	Carrot Processing Facility; TCWD
TC-2	**Conversion of Granite Quarry to Sycamore Ranch**	The Granite Co. quarry, located upstream of the Sycamore Spreading Basins, is approaching the end of its operational life and could be converted into a balancing / detention / spreading reservoir. Excess flows in the North Canal could be pumped into the quarry reservoir, so the detained water could be recirculated for irrigation demands in-lieu of groundwater pumping and/or recharged.	✓	✓		Supplemental Water Use	To be implemented upon adoption of GSP / Grant funding	Infrastructure improvement; no public noticing necessary	CEQA; DMR SMARA permit closure; NEPA requirements if grant funds are used	**Geotechnical study complete; AEWSD and TCWD have participated in several meetings to discuss the permitting process for this project**	Once Granite completes reclamation; anticipated initiation by 2027	Construction duration TBD	2030	**1500**	**0**	✓		✓			Additional wet-year imported water supplies	Property acquisition or land use agreement with quarry owner	$15,000,000	TBD	AEWSD, TCWD, grants
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	TCWD, subsidized by landowner (TRC)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented		Functional		In-Process			As-Needed					
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	TCWD, subsidized by landowner (TRC)
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	TCWD, subsidized by landowner (TRC)
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	TCWD, subsidized by landowner (TRC)
KSB-4	Coordination with Basin Study	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	TCWD, subsidized by landowner (TRC)
KSB-6	White Land Demand Management	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	TCWD, subsidized by landowner (TRC)
KSB-7	Well Registry	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	TCWD, subsidized by landowner (TRC)
KSB-8	Consumptive-Use Study	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	TCWD, subsidized by landowner (TRC)
KSB-9	California Aqueduct Subsidence Action Plan	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	RMW Data Gaps	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

Subbasin-wide P/MAs either that contribute to water demand reduction include:

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" by 0 AFY by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or have been implemented that contribute to water supply augmentation include:

TC-1 Recharge of Carrot Wash Water - Tejon Ranch Company (TRC) recharges carrot wash water generated at a nearby carrot processing facility to a 75.5-acre parcel located just outside of the Tejon-Castac Management Area (Township 32S Range 30E Section 6). This project is anticipated to continue in the future, and results in a local recharge benefit of 300 AFY. A production well may be installed in the future at the site to allow for recovery of recharged groundwater.

TC-2 Conversion of Granite Quarry to Sycamore Ranch - The Granite Co. quarry, located upstream of the Sycamore Spreading Basins, is approaching the end of its operational life and could be converted into a balancing / detention / spreading

reservoir. Excess flows in the North Canal could be pumped into the quarry reservoir, so the detained water could be recirculated for irrigation demands in-lieu of groundwater pumping and/or recharged. Estimated benefit from this project is 3,000 – 6,000 AFY in wet years, or 1,500 AFY on average when considering non-wet years.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.

d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

(whenever feasible) to restore long-term water access to the home.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K). See Appendix J for GSA-specific details on targeted P/MAs within close proximity to the California Aqueduct.

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is

one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by TCWD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting processes that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** the TCWD GSA has a Pre-SGMA positive net water budget of 1,751 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the TCWD GSA retains a positive water budget of 3,366 AFY for 2015-2023. The P/MA combined portfolio represented herein is expected to continue the net positive annual water budget of the pre-SGMA and post-SGMA periods and avoid Undesirable Results by reducing demand and increasing supply within the GSA area.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 1. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the “Glide Path” level of expected benefits shown in Table 2.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve indirect supply augmentation through, for example, increased groundwater storage, quantification of the benefit will require tracking of deliveries to said projects against the estimated case. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the “Glide Path”), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (TC-1 and TC-2) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provide water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. TCWD would contract with AEWSD to receive excess flows in the North Canal. AEWSD has a contract with the United States Bureau of Reclamation (USBR) for 40,000 acre-feet per year (AFY) of Class 1 water and 311,675 AFY of Class 2 water from the Friant Division of the Central Valley Project (CVP). AEWSD also has access to water from the following associated sources: Recovered Water Account (RWA), Unreleased Restoration Flows (URF), Recapture & Recirculation (R/R), and Section 215 water.

Industrial Process Water

TC-1 utilizes industrial process water from a carrot washing facility.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Water banking recharge projects have been designed assuming a wet year occurs every 2.5 years, with a maximum benefit over 100 days. Water supply augmentation benefits have been calculated as follows:

Annual Water Benefit = estimated infiltration rate ft/day * wetted acres * 100 days operation per year * 40 percent of years being wet

P/MAs (TC-1 and TC-2) will be met with AEWSD contract water or industrial process water.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The TCWD is a water district, that possesses the legal authority to implement P/MAs discussed herein. As GSAs, per California Water Code (CWC) § 10725 through 10726.8, the TCWD GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of “one-time” costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- TCWD general funds, generally supported and subsidized by landowner fees;
- Partnering agencies or entities or certain P/MAs (e.g., AEWSD, carrot processing facility); and/or
- Grant funding from sources including DWR and others.

Estimated costs for TCWD GSA P/MAs by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Tejon-Castac Water District GSA	Estimated Costs	
	One-time	Annual
Implemented	$4,500	$95,000
Functional		
In-Process	$15,025,000	$60,000
As-Needed		
Total	**$15,029,500**	**$155,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that augment supplies from additional outside sources of water, particularly during normal to wet years. Some of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes participating in Subbasin-wide policy-based management actions aimed at demand reduction and mitigation. Through this combination of increased recharge during wet years, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Westside District Water Authority GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44(b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

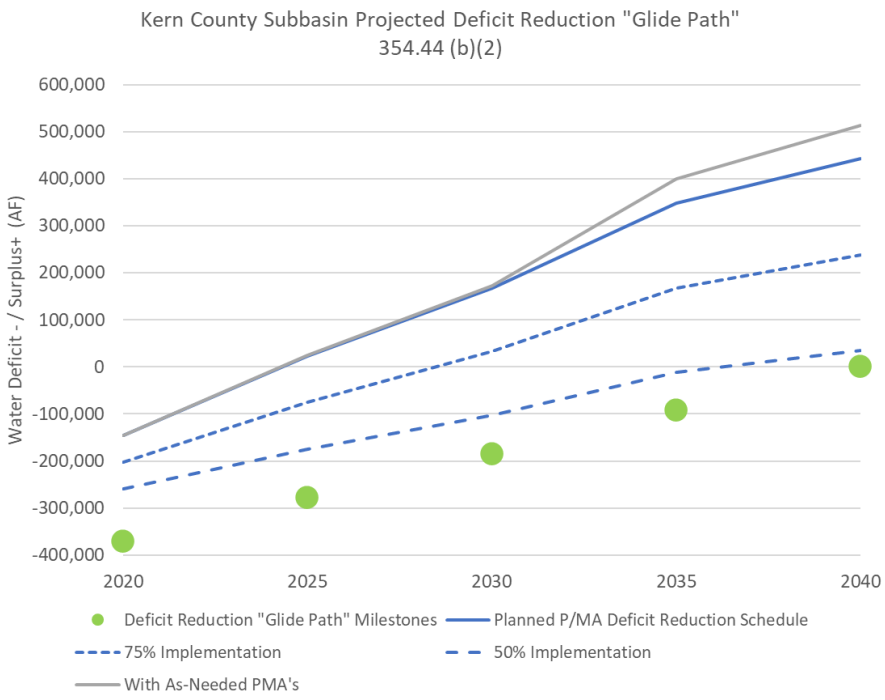


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

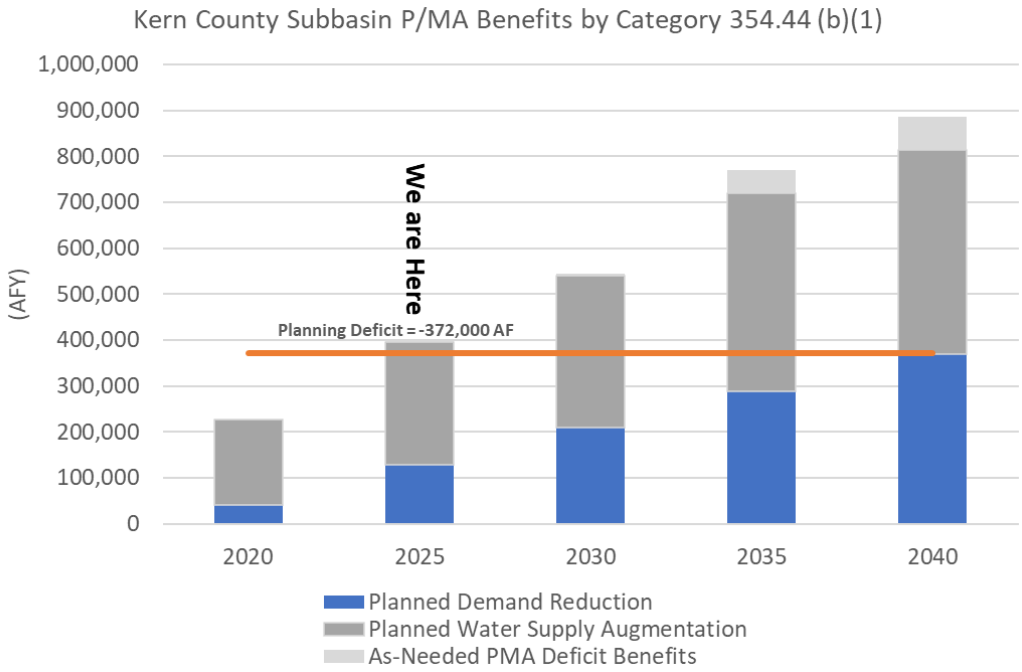


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Westside District Water Authority GSA (WDWA)

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for WDWA GSA in Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (0 AFY) of the projected deficit of 0 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)

WDWA GSA Projected-Future Scenerio Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	0	0	0	0	0
	Demand Reduction	0	500	0	0	0
	Ag to Urban Conversion	0	0	0	0	0
	Water Conservation-Efficiency	0	0	0	0	0
	Subtotal	**0**	**500**	**0**	**0**	**0**
Planned Water Supply Augmentation	Supplemental Water Recharge	0	0	0	0	0
	Supplemental Water Use					
	Third-Party Banking	0	0	0	0	0
	New Local Supply	0	0	0	50,000	50,000
	Exercise of Rights	0	0	0	0	
	Subtotal	**0**	**0**	**0**	**50,000**	**50,000**
P/MA Implementation Schedule*		**0**	**500**	**0**	**50,000**	**50,000**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*0*
Planned P/MA Deficit Reduction Schedule*		**0**	**500**	**0**	**50,000**	**50,000**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

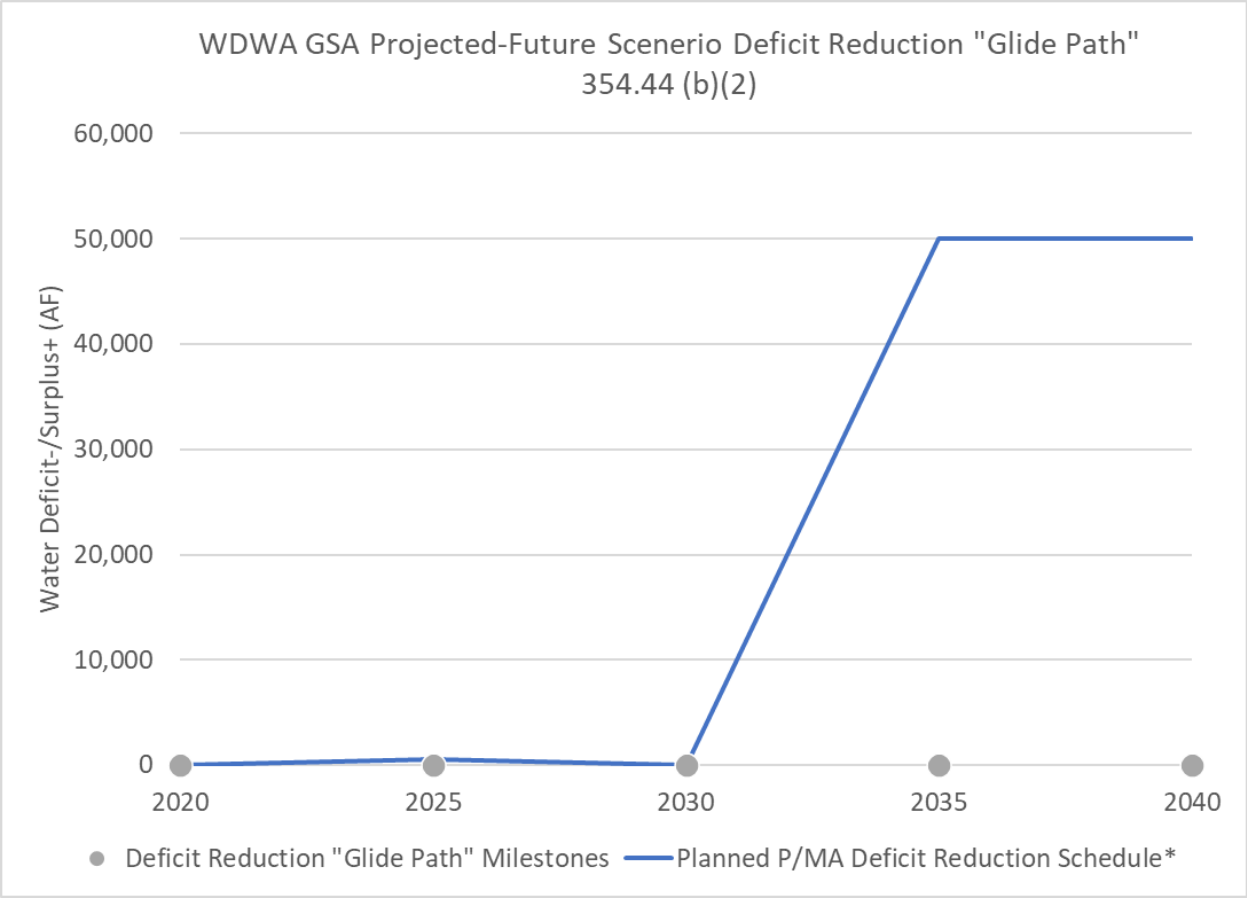


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example RRB-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (WDWA GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Complete / Functional / In-Process	As-Needed										Implemented	Functional	In-Process				As-Needed					
WDWA-1	**Long-Term Supplemental Water Programs**	WDWA GSA is a Joint Powers Authority comprised of Belridge Water Storage District, Berrenda Mesa Water District, and Lost Hills Water District. Between 2015 and 2023, the three districts have successfully purchased over 1.6 million acre feet from State Water Contractors, Central Valley Project Contractors, pre-1914 water rights holders, and the SWP Dry-Year transfer program. Several of these purchases are multi-year long term agreements valid until 2030, with first right of refusal to renew.	✓	✓	✓	Supplemental import secured by existing contract	Complete	Board meetings, CEQA EIR review period, other DWR/SWRCB public noticing requirements	CEQA EIR, DWR SWAPO approval, CVP Bureau of Reclamation approval, Kern County Water Agency approval, SWRCB water rights petition of change of place of use	**Implemented and Continuously Ongoing**	Complete	Complete	Implemented	**80,000**	**0**			✓			State Water Project (Table A, Article 21, Article 56), CVP, Pre-1914 appropriative rights, local Kern River supplies, SWP Dry-Year program	None	$0	$10,000,000	Participating landowner assessments
WDWA-2	**Conjunctive Reuse of Naturally Degraded Brackish Groundwater**	Phased project that will integrate the modular treatment and conjunctive use of brackish groundwater and oil field produced water. A Phase I project engineering feasibility study for has been completed. Negotiations with project partners, financing options, and development of a Front-End Engineering & Design (FEED) report are the next phase of project implementation.	✓	✓		New Local Supplies	Results of feasibility study indicate viable project	To be determined by feasibility study	CEQA, additional regulatory requirements to be determined by feasibility study	**In-Process**	2025	2035	2035-	**50,000**	**0**	✓				✓	Treated brackish groundwater and oilfield produced water	None	$60,000,000	$2,000,000	Landowner assessments, federal and state grant programs
WDWA-3	**Delta Conveyance Project**	Via KCWA's status as a State Water Contractor, WDWA GSA's JPA members (BMWD, BWSD, and LHWD) participate in funding the Delta Conveyance Project. DCP aims to modernize the aging water infrastructure and improve the reliability of water transported through the Delta. It seeks to address the challenges posed by climate change, seismic risks, and environmental concerns.	✓	✓		Exercise of Rights	Completion of Project	Stakeholder Meetings, Board Meetings, CEQA EIR review period, other DWR/SWRCB public noticing requirements	All permitting and regulatory processes are being managed by DWR	**Environmental Design**	Current	2045-	2045-	**17,806**	**0**	✓					SWP Table A, Article 21	None	$12,465,349	$4,000,000	District contributions to KCWA DCP funding costs (gathered via District landowner assessments)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		**Implemented** **Functional** **In-Process**	**As-Needed**											**Implemented**	**Functional**	**In-Process**				**As-Needed**					
WDWA-4	**Net Zero Well Drilling Moratorium within Close Proximity to Critical Infrastructure**	To ensure no net increase of groundwater extraction capacity within the California Aqueduct Subsidence Program (CASP) 5 mile CA Aqueduct "Buffer Zone", new well drilling is prohibited within the Buffer Zone unless explicitly approved by the Board of Directors, which may allow replacements only if an existing well within the Buffer Zone is abandoned.	✓		✓		Complete	Impacted stakeholder meetings (4) and public Board of Directors meeting (2/20/24)	NA	**Implemented**	Complete	Complete	2024-	**NA**	**NA**					✓	NA	None	$2,500	$1,000	WDWA GSA via landowner assessments
WDWA-5	**Mandatory Well Registration**	To further supplement Kern County Subbasin Well Registry (KSB-7) management action, WDWA GSA has implemented a mandatory well registration program that requires all currently existing and future wells drilled within WDWA GSA register with the GSA and provide well construction reports and water quality analyses, if available. The policy also requires new wells have a flowmeter installed, well owners allow the GSA to use the well for monitoring (if located in a data gap area), and well owners provide annual status updates for each well (active, inactive, damaged, abandoned, etc.).	✓	✓	✓		Complete	Impacted stakeholder meetings (4) and public Board of Directors meeting (2/20/24)	NA	**Implemented**	Complete	Complete	2024-	**NA**	**NA**					✓	NA	None	$5,000	$1,000	WDWA GSA via landowner assessments
WDWA-6	**Well Extraction Volume Reporting within Close Proximity to Critical Infrastructure**	All well owners within the CASP 5-mile Buffer Zone of the CA Aqueduct are required to report annual groundwater extraction volume (measured by flowmeter) by February 1 of the following year.	✓		✓		Complete	Impacted stakeholder meetings (4) and public Board of Directors meeting (2/20/24)	NA	**Implemented**	Complete	Complete	2024-	**NA**	**NA**					✓	NA	None	$2,500	$1,000	WDWA GSA via landowner assessments
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**NA**	**NA**	✓				✓	NA	NA	$0	$25,000	WDWA GSA via landowner assessments
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**NA**	**NA**				✓	✓	NA		$0	$25,000	WDWA GSA via landowner assessments

WDWA-9	**Groundwater Extraction Moratorium within Close Proximity to Critical Infrastructure**	The WDWA GSA has implemented a pumping moratorium for all supply wells within the CASP Monitoring Corridor between California Aqueduct Mileposts 195 to 215. The purpose of this PM/A is to further ameliorate the potential for GSA related activities contributing to the California Aqueduct subsidence identified adjacent to the Lost Hills Oil Field.	✓		✓	Demand Reduction	Complete	NA	NA	**Implemented**	Ongoing	Ongoing	2024-	**0**	**<500 AF/year on average**				✓	✓	NA	Completed	$5,000	$2,500	WDWA GSA via landowner assessments
KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2025	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	WDWA GSA via landowner assessments
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	WDWA GSA via landowner assessments
WDWA-7	**CA Aqueduct CASP Collaboration and Data Sharing Agreement**	To address subsidence along Mileposts 195-215 of the CA Aqueduct and fill data gaps, WDWA GSA is developing a collaboration and data sharing agreement with CASP. Components of the agreement may include (1) quarterly coordination meetings between WDWA GSA and CASP, (2) share well location and extraction volume within the CA Aqueduct Buffer Zone data with CASP, and (3) reviewing annual subsidence rates and CASP collected well and extensometer data.			✓		In-Process	NA	NA	**In-Process**	In-process	2025	2024-	**0**	**0**					✓	NA	None	$5,000	$2,500	WDWA GSA via landowner assessments
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	WDWA GSA via landowner assessments
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	WDWA GSA via landowner assessments
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	WDWA GSA via landowner assessments

KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing	2025-						✓	✓	NA	NA	$0	Unknown at this time	Unknown at this time
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
WDWA-8	**As-Needed Land Fallowing**	Since 2015, WDWA GSA landowners have fallowed over 13,000 acres of permanent crops. Due to naturally high salinity levels, WDWA GSA's groundwater cannot be used for agricultural beneficial use without blending or other prohibitively expensive treatment. Thus, WDWA GSA landowners are 98% reliant on imported surface water supplies (on average between 2015 to 2023) to meet irrigation demand. In dry years where irrigation demand exceeds the Table A allocation provided by the SWP, WDWA GSA landowners utilize their robust supplemental surface water purchase and storage program (P/MA WDWA-1) rather than increase groundwater pumping and risk permanent crop damage or death due to salt stress.	✓			Demand Reduction	Complete	NA	NA	**As Needed**	Ongoing	Ongoing	As-Needed	**0**	**39,000 cumulative acres since 2015**						NA	None	Landowner asset losses of more than $400,000,000 in market value	N/A	None required, landowners absorb revenue losses

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a “Glide Path” that will result in closing the currently identified the WDWA GSA “deficit” of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA specific P/MAs either currently being implemented or which have been implemented or in-process, that contribute to water demand reduction include “voluntary” land fallowing.

WDWA-8 As-Needed Land Fallowing - WDWA GSA has no further demand reduction projected under the 2030 Climate Change Scenario thus no additional demand reduction P/MAs are required to be implemented. However, WDWA GSA has identified “voluntary” land fallowing as an “as-needed” P/MA. Since 2015, WDWA GSA landowners have fallowed over 13,000 acres of permanent crops. Due to naturally high salinity (TDS) levels, WDWA GSA's groundwater cannot be used for agricultural beneficial use without blending or other prohibitively expensive treatment. On average, between 2015 to 2023, WDWA GSA landowners were 98% reliant on imported surface water supplies, primarily supplied by the State Water Project (SWP), to meet irrigation demand. WDWA GSA JPA member districts (Belridge Water Storage District [BWSD], Berrenda Mesa Water District [BMWD], and Lost Hills Water District [LHWD]) collectively hold 333,218 AFY of SWP Table A entitlement via the Kern County Water Agency. In dry years where irrigation demand exceeds the SWP Table A allocation, WDWA GSA landowners first utilize their robust supplemental surface water purchase and storage program (PMA WDWA-1) to supplement water supplies. Due to high salt levels, landowners cannot use groundwater to compensate for inadequate surface water supplies without risking permanent crop damage/death. If PMA WDWA-1 fails to provide sufficient supplemental surface water supplies, landowners are forced to either deficit irrigate (reducing crop yields) or selectively fallow acreage to conserve available surface water supplies.

Historically, WDWA GSA landowners have “voluntarily” fallowed acreage if irrigation demand exceeds surface water supply. While WDWA GSA does not mandate land fallowing in dry years, economic viability of surface water costs and impacts to crop health due to poor groundwater quality act as natural enforcement mechanisms against groundwater overdraft. Landowners are empowered to make strategic fallowing decisions via WDWA GSA’s member districts’ use of Latis Water District Management Software. Latris tracks available surface water supplies versus delivered surface water volumes on a weekly time step at the landowner level. Landowners use these data to determine if they have sufficient surface water supplies for their acreage and make voluntary fallowing decisions to re-direct available supplies to the remainder of their planted acreage.

WDWA-9 Groundwater Extraction Moratorium within Close Proximity to Critical Infrastructure - In consultation with the California Aqueduct Subsidence Program (**CASP**), WDWA GSA and the former Kern Groundwater Authority (**KGA**) have completed six technical studies that lay the foundation for the current understanding of subsidence dynamics in the area between Mileposts 195 to 215 of the California Aqueduct. While these technical studies have not indicated that groundwater extraction is currently a factor contributing to this subsidence, WDWA GSA is committed to working in close consultation with CASP and adjacent GSAs to monitor and collect additional data to further refine its current understanding of the causes and rate of subsidence. In order to protect the California Aqueduct from any future subsidence impacts while additional data are collected, the WDWA GSA Board of Directors adopted a Moratorium on Groundwater Extractions within Proximity to Critical Infrastructure Impacted by Subsidence Management Action on November 5, 2024. This management action was developed utilizing stakeholder input gathered over four direct meetings with impacted stakeholders, including CASP, and a public WDWA GSA board meeting. The full text of this management action can be found on WDWA GSA's website: https://www.westsidedwa.org/.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-Districted Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" That will result in maintaining WDWA GSA "deficit" by 0 AFY (i.e., a surplus) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA specific Projects either currently being implemented, previously implemented, or in-process that contribute to water supply augmentation include:

WDWA-1 Long Term Supplemental Water Programs - Prior to the passage of SGMA, WDWA GSA landowners could not rely upon groundwater supplies to weather surface water supply shortages due to poor groundwater quality. Therefore, WDWA GSA JPA member districts made, and continue to make, significant investments in supplemental surface water acquisition and banking programs to diversify their water supply portfolio. WDWA GSA, via its JPA member districts, has successfully purchased over 1.6 million AF from State Water Contractors (SWCs), Central Valley Contractors, pre-1914 water rights holders, and the SWP Dry-Year program since 2015. Several WDWA GSA landowners also have independent supplemental surface water acquisition programs; however, to be conservative in calculating available supplemental supplies, the volumes acquired from these independent landowner programs are not included in this P/MA WDWA-1. Several of these purchases are long-term agreements valid through 2030, with first right of refusal for renewal. In wet years, WDWA GSA JPA member districts have the ability to purchase and bank surplus surface water supplies within the Pioneer Project and Berrenda Mesa Spreading Grounds for later recovery in dry years. In comparison to other agricultural water districts that can utilize groundwater supplies in dry years, WDWA GSA JPA member districts are 98% dependent upon imported surface water and, as a result, purchase water at market-driven prices as needed. As a result, even in critically dry years, WDWA GSA member districts have demonstrated success acquiring significant volumes of supplemental surface water supplies. For example, in 2022, a critically dry year and second back-to-back year of 5% allocation on the SWP, WDWA GSA member districts were able to acquire nearly 40,000 AF (costing approximately $54,000,000) in supplemental surface water supplies while other water districts reverted to significantly less expensive groundwater supplies. In addition to historical success acquiring surface water supplies, the Department of Water Resources (DWR) amended the SWP water supply contracts with all SWCs in 2021 to include new “water management tools” that allow for greater flexibility on transfers and exchanges between SWCs. The revised “water management tools” increases WDWA GSA’s member districts’ ability to acquire supplemental surface water supplies from other SWCs, when needed.

WDWA-2 Conjunctive Reuse of Degraded Brackish Groundwater - The project, which is in its initial stages of development, will integrate modular treatment and beneficial conjunctive reuse of brackish groundwater and oil field produced water. A Phase I engineering feasibility study has been completed. Next steps include negotiations with project partners, identifying funding options, and development of a Front End Engineering Design (FEED) study. Current estimates indicate this project could come online in 2030. When all project phases are complete, the project would provide approximately 50,000 AFY of treated water derived from non-conventional resources.

WDWA-3 Delta Conveyance Project - WDWA's member districts currently participate in funding the current Delta Conveyance Project via payments made by member units of the Kern County Water Agency. While future benefits from this in process project are anticipated, benefits are not currently included or relied upon to maintain groundwater sustainability within WDWA GSA (i.e., zero water budget deficit).

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

WDWA-4 Net Zero Well Drilling Moratorium within Close Proximity to Critical Infrastructure - To further refine the current understanding of the causes of subsidence along the California Aqueduct Mileposts 195-215, fill potential future data gaps, and address previous comments made by the California Aqueduct Subsidence Program (CASP), WDWA GSA implemented a net-zero well drilling moratorium within the CASP 5 mile-wide California Aqueduct "Buffer Zone". The PM/A prohibits new groundwater extraction well drilling within the CASP Buffer Zone unless explicitly approved by the WDWA GSA Board, which may allow replacement wells only if an existing groundwater extraction well within the Buffer Zone is abandoned. The purpose of this management action is to ensure there is no increase in GSA-related groundwater extraction within the CASP Buffer Zone. This management action was developed utilizing stakeholder input gathered over five direct meetings with impacted stakeholders, including CASP, and two public WDWA GSA board meetings. The full text of this management action can be found on WDWA GSA's website: https://www.westsidedwa.org/.

WDWA-5 Mandatory Well Registration - To further supplement the Kern County Subbasin Well Registry management action (KSB-7), WDWA GSA has implemented a mandatory well registration program that requires all currently existing and future groundwater extraction wells drilled within WDWA GSA register with the GSA. Information required from well-owners includes well construction reports and water quality data, if available. The policy also requires new wells to have a flowmeter installed and allow the GSA to use the well for monitoring, if located in an identified data gap area. Well owners are required to provide annual status updates to the GSA for each well. This management action was developed utilizing stakeholder input gathered over five direct meetings with impacted stakeholders, including CASP, and two public WDWA GSA board meetings. The full text of this management action can be found on WDWA GSA's website: https://www.westsidedwa.org/.

WDWA-6 Well Extraction Volume Reporting Within Close Proximity to Critical Infrastructure - To further refine the current understanding of the causes of subsidence along the California Aqueduct Mileposts 195 to 215, fill potential future data gaps, and address previous comments made by CASP, all well owners within the CASP Aqueduct Buffer Zone are required to report annual groundwater extraction volumes (as

measured by flowmeter) to the GSA. This management action was developed utilizing stakeholder input gathered over five direct meetings with impacted stakeholders, including CASP, and two public WDWA GSA board meetings. The full text of this management action can be found on WDWA GSA's website: https://www.westsidedwa.org/. This management action was adopted prior to the WDWA-9 Groundwater Extraction Moratorium within Close Proximity to Critical Infrastructure Management Action and will be used as an enforcement mechanism of WDWA-9.

WDWA-7 CASP Collaboration and Data Sharing Agreement - To further refine the current understanding of the causes of subsidence along California Aqueduct Mileposts 195-215 and fill potential future data gaps, the WDWA GSP is developing a collaborative data sharing agreement with CASP. Components of the agreement may include:

- Quarterly technical meetings with CASP
- Sharing of GSA-related well location and extraction volumes
- Annual review of subsidence rates measured by InSAR and CASP collected data.
- KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Safe and Affordable Funding for Equity and Resilience Program (SAFER) projects, as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

- Improve the understanding of the groundwater response to the implementation of P/MAs.
- Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.

- Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
- Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern

Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to

an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by WDWA GSA related activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in **Appendix K-1**. If either the projects or management actions are unable to produce the projected supplies or more cost-effective alternatives arise, WDWA GSA may deviate from the actions described above. At each 5-year planning window, each previously described project and management action will be evaluated, and new projects and management actions considered for implementation. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary “Glide Path” has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the “Glide Path” Milestones as a minimum requirement. As previously discussed, WDWA GSA does not have a groundwater deficit, thus WDWA GSA has already achieved the “Glide Path” 2020-2040 five-year milestones and total deficit reduction goal and is not required to implement additional deficit reduction measures. The anticipated P/MA implementation schedule presented forecasts WDWA GSA ability to continue to remain in groundwater surplus through 2040.

P/MAs have been categorized on Table 3 as: Implemented, Functional, In-Process, or As-Needed.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ **23 CCR § 354.44(b)(1)(B)**

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. WDWA GSA board meetings are noticed and open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ **23 CCR § 354.44(b)(2)**

As discussed in **Section 9**, **Appendix N**, WDWA GSA does not have a minimum target P/MA goal. WDWA GSA does not currently have, nor is it projected to have, a groundwater deficit. The projected water budget indicates that under the 2030 Climate Change Scenario, imported water supplies to the WDWA GSA may be reduced. However, this modeled reduction in surface water supply would not have a significant effect on WDWA GSA's ability to maintain a groundwater surplus due to the magnitude of WDWA GSA's currently modeled surplus and the inability to significantly increase groundwater extractions due to poor groundwater quality. The P/MAs presented herein are expected to result in benefits that will help avoid Undesirable Results and maintain sustainability.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3. Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 2**.**

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential supplemental water supplies for PMA WDWA-1 could come from the following sources:

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. BMWD, BWSD, and

LHWD currently receive SWP water through a water supply contract (combined entitlement of 333,218 AFY) with Kern County Water Agency, one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and imported into Kern County. When applicable, BWSD, BMWD, and LHWD also participate in the State Water Project dry-year program, facilitated by the State Water Contractors, which provides SWCs with the ability to purchase additional surface water in low SWP allocation years from partners who make water available via groundwater substitution, reservoir re-operations, and rice fallowing. In addition to already contracted SWP Table A entitlement, BWSD, BMWD, and LHWD have multiple long-term purchase agreements in place with other SWCs to purchase varying volumes of supplemental supplies, providing an additional consistent source of supplemental surface water. BMWD, BWSD, and LHWD are active participants in the Kern Fan Banking Projects, which allow the districts to store acquired surface water for later use during times of drought.

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. While WDWA GSA's districts (BMWD, BWSD, and LHWD) are not CVP contractors, BWSD has some land located within the CVP place of use (POU). BMWD, BWSD, and LHWD have historically purchased supplemental surface water from CVP contractors and utilized the surface water in-district via exchange or application to lands within the BWSD’s CVP POU.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion. When available, WDWA GSA member districts can receive Kern River water through water service agreements with the Kern County Water Agency. In addition, WDWA GSA member districts have existing, long-term agreements with district partners outside of Kern County to purchase and import conserved pre-1914 water.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Due to naturally occurring poor groundwater quality, there are no groundwater recharge or storage projects implemented or planned for future implementation within WDWA GSA's boundaries.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

WDWA GSA is a JPA comprised of BMWD, BWSD, and LHWD and possesses the legal authority to implement the P/MAs discussed herein. Per California Water Code (CWC) § 10725 through 10726.8, WDWA GSA also possesses the legal authority necessary to implement the demand management P/MAs described herein. WDWA is also a GSA for those lands within its boundaries. WDWA has entered into SGMA contracts with certain landowners outside of WDWA's water service area that are within the boundary of KNDLA. Pursuant to such SGMA contracts and WDWA's membership in KNDLA, WDWA has the authority to include these areas outside the WDWA service area in its GSA boundaries and otherwise impose P/MAs, including demand management, on the lands that are subject to the contracts. WDWA is also a general member of the KNDLA and has entered into an agreement with KNDLA providing WDWA the jurisdiction to implement P/MAs, including the demand management P/MAs discussed herein, on those lands outside of the WDWA boundary but within the KNDLA boundary where WDWA has contracted with the landowner for SGMA purposes. This arrangement is consistent with the intent of the legislature in enacting SGMA, to manage groundwater basins through the actions of local governmental agencies to the greatest extent feasible. (Cal. Water Code § 10720.1(h)).

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- BMWD, BWSD, and LHWD district assessments and/or water charges.
- Grant funding from sources including, but not limited to DWR, SRWCB, United States Bureau of Reclamation (USBR), and CA WISP.
- Estimated costs for WDWA GSA P/MA's by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Westside District Water Authority GSA	Estimated Costs	
	One-time	Annual
Implemented	$15,000	$10,100,500
Functional		
In-Process	$72,495,349	$6,062,500
As-Needed		
Total	**$72,510,349**	**$16,163,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, the primary means any future potential deficits will be addressed is through implementation of P/MAs that reduce demand and/or augment supply using the water supply sources identified herein.

In addition to utilizing PM/A WDWA-1 to supplement imported surface water supplies, PM/A WDWA-2 would utilize treatment of degraded brackish water for conjunctive reuse to produce a new supplemental water supply. PM/A WDWA-2 is not assumed to be functional until at least 2030. An initial feasibility study had been completed and next steps are in process. However, WDWA-2's supplemental supplies are not needed to maintain groundwater sustainability within WDWA GSA; rather, treated supplies would represent additional irrigation supply derived from non-conventional, drought tolerant sources.

In addition to these supply augmentation projects, WDWA GSA also included a policy-based management action aimed at demand reduction in the form of a voluntary fallowing program (WDWA-8) and a moratorium on groundwater extractions within the California Aqueduct CASP buffer zone. Via a combination of naturally occurring poor groundwater quality limiting agricultural and beneficial use of groundwater within WDWA

GSA, and the implementation of the PM/As presented herein, WDWA GSA will continue to maintain the groundwater supply surplus within the GSA through 2040 and beyond.

West Kern Water District GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage "deficit" of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address 25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year

milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		2020	2025	2030	2035	2040
Projected Deficit			-372,000			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

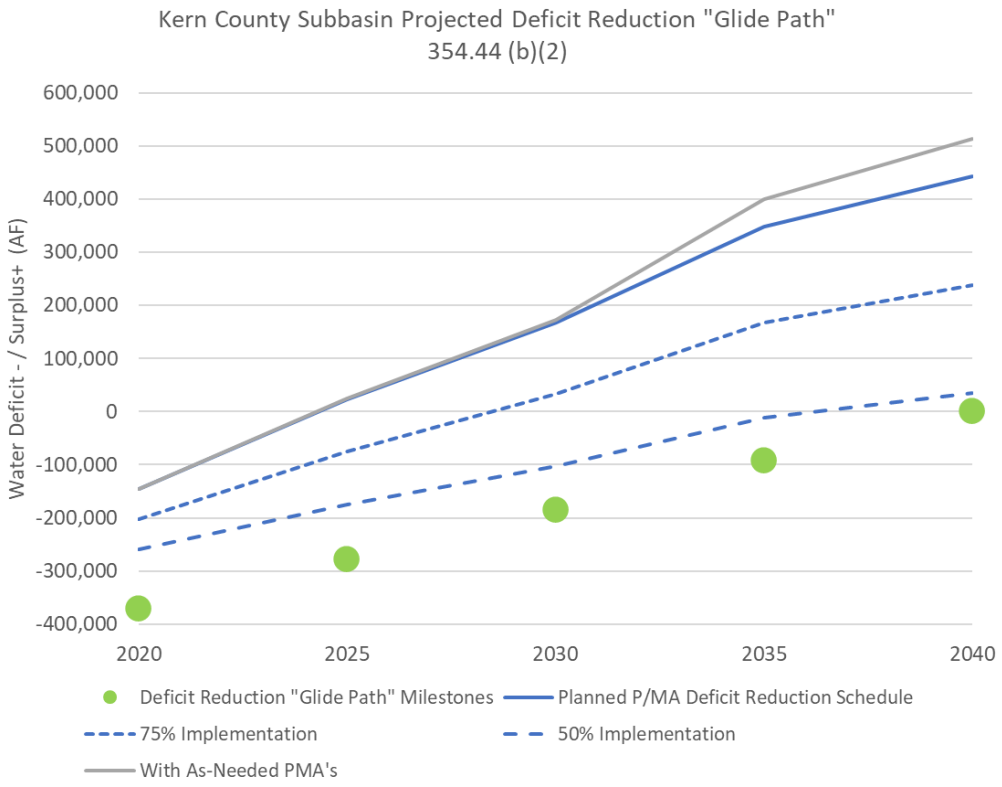


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

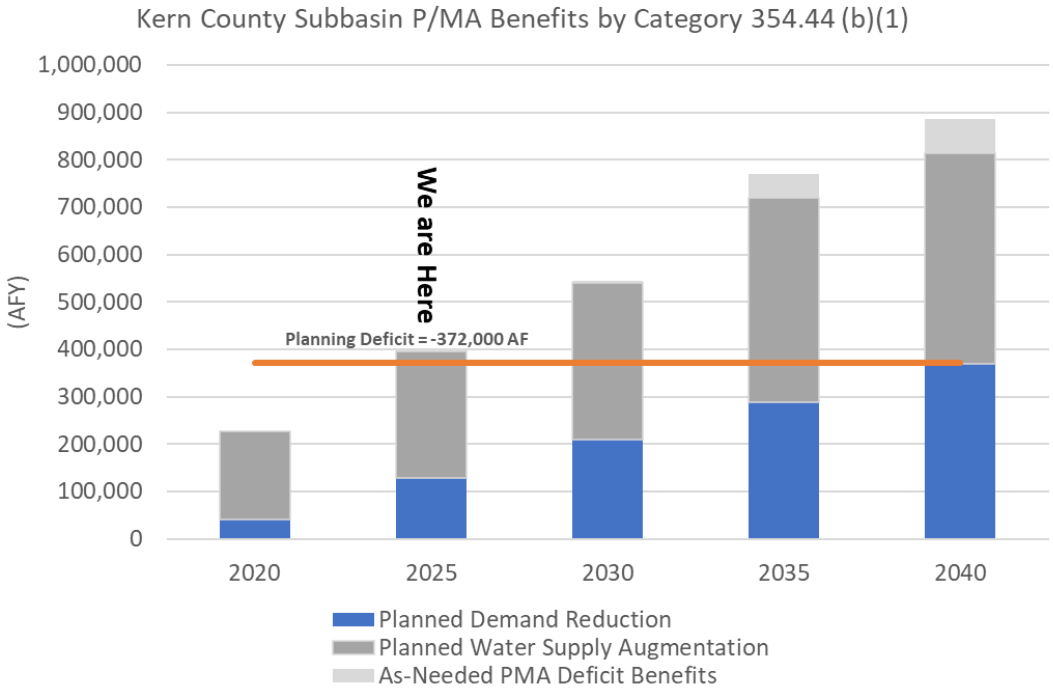


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – West Kern Water District (WKWD) GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the exact schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for WKWD GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (0 AFY) of the projected deficit of 0 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2020.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
WKWD GSA Projected-Future Scenerio Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			0			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**0**	**0**	**0**	**0**
Deficit Reduction "Glide Path" Milestones		**0**	**0**	**0**	**0**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	0	0	0	0	0
	Demand Reduction	0	0	0	0	0
	Ag to Urban Conversion	0	0	0	0	0
	Water Conservation-Efficiency	0	191	191	191	191
	Subtotal	**0**	**191**	**191**	**191**	**191**
Planned Water Supply Augmentation	Supplemental Water Recharge	0	0	0	0	0
	Supplemental Water Use	0	0	0	0	0
	Third-Party Banking	0	0	0	0	0
	New Local Supply	0	0	0	0	0
	Exercise of Rights	0	0	0	0	0
	Subtotal	**0**	**0**	**0**	**0**	**0**
P/MA Implementation Schedule*		**0**	**191**	**191**	**191**	**191**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*0*	*5,423*
Planned P/MA Deficit Reduction Schedule*		**0**	**191**	**191**	**191**	**191**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

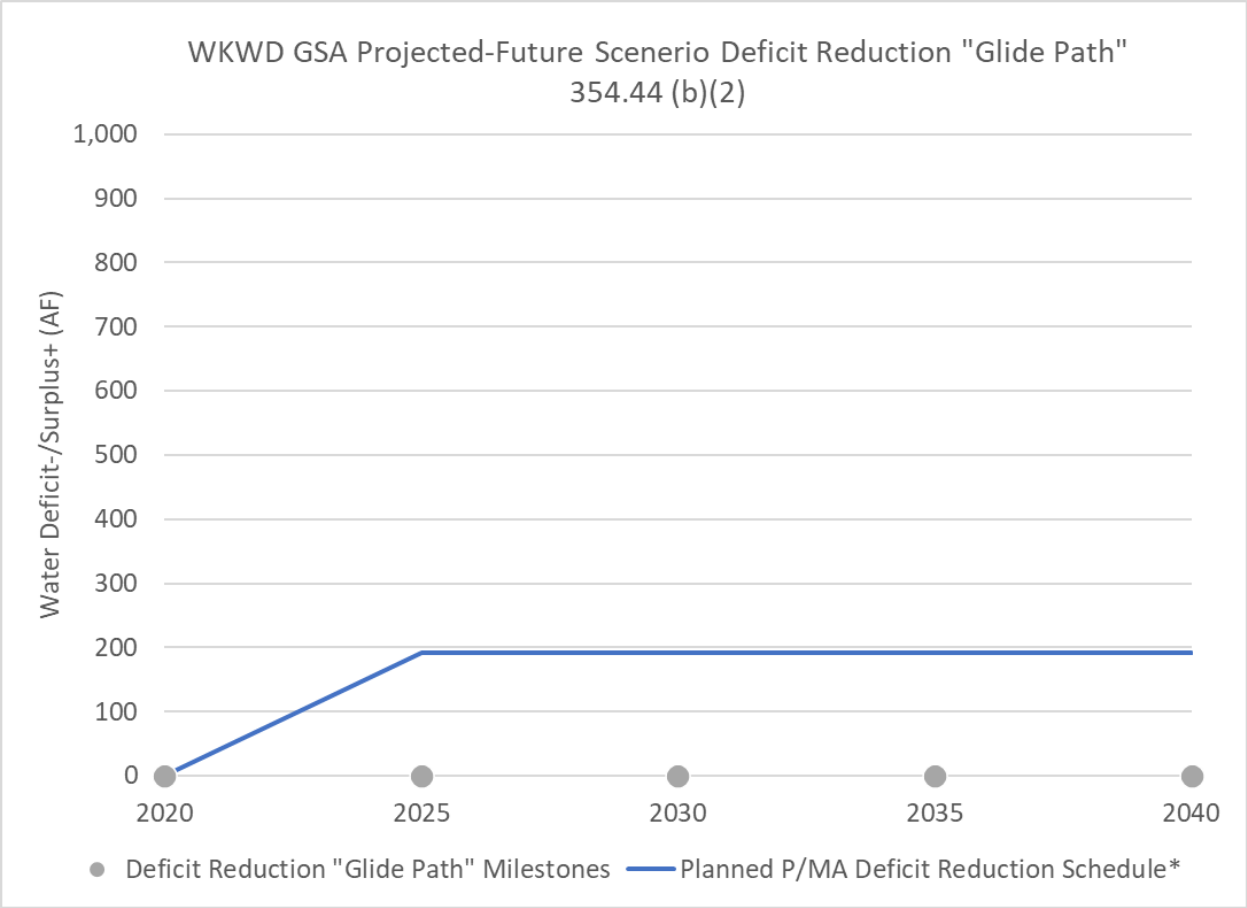


Figure 3. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example WKWD-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process				As-Needed					
WKWD-1	**Automatic Meter Reading Project**	This includes the installation of Automatic Meter Readers on all residential and commercial customers in the WKWD.	✓	✓	✓	Water Conservation-Efficiency	Pre-SGMA, supports SGMA goals	Notices and WKWD Board Meetings	NA	**Complete**	2023	2023	2023-	**0**	**191**	✓		✓			NA	NA	$1,500,000	$0	Grant
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	Rate Payers, Grants
WKWD-2	**Participation in Delta Conveyance Facility**	Participation in the DCP. Alternative under Delta tunnels.	✓	✓	✓	Exercise of Rights	Completion of Project	Stakeholder Meetings Board Meetings Hearing	NA	**Environmental Design**	Ongoing	2045-	2045-	**3100**	**0**						SWP Table A, Article 21	None		$700,000	Water Rates
WKWD-3	**Buena Vista Recreation Area Water Supply Management Coordination**	Coordination with Kern County on the operations and extractions required for BVARA.	✓			Exercise of Rights	Fill data gap	NA	NA	**In-Process**	Began during GSP development	TBD	TBD	**0**	**0**	✓	✓	✓	✓	✓	NA	NA			NA

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits								Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary										
			Groundwater Level & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring				One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process				As-Needed						
KSB-2	Coordination with Groundwater Regulatory Programs	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	Rate Payers, Grants
KSB-3	Exceedance Policy	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	Rate Payers, Grants
KSB-5	Well Mitigation Program	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	Rate Payers, Grants
KSB-4	Coordination with Basin Study	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	Rate Payers, Grants
KSB-6	White Land Demand Management	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	Rate Payers, Grants
KSB-7	Well Registry	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	
KSB-8	Consumptive-Use Study	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	
KSB-9	California Aqueduct Subsidence Action Plan	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													

KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time
WKWD-4	**Continued Participation in Basin-Wide Coordination**	Coordinate with all other GSA's within the Kern Subbasin to address regulatory requirements and determination.	✓	✓	✓	Exercise of Rights	NA	Stakeholder Meetings Board Meetings	NA	**In-Process**	NA	2040	2020-	**0**	**0**	✓	✓	✓	✓	✓	NA	NA	$0	$100,000	Rate Payers, Grants
WKWD-5	**Continued Balanced Pumping and Recharge**	Continued balanced pumping of groundwater and recharge of imported supplies has and will continue to be the operational norm for WKWD. Under this management action, recharge and recovery activity will continue to be monitored closely by WKWD to maintain balanced conditions.	✓	✓	✓		As-needed	NA	NA	**As-Needed**	As-Needed	NA	NA	**0**	**0**	✓		✓			NA	NA	$0	$0	NA
WKWD-6	**Implement Water Shortage Response Plan**	Implement conservation measures during drought periods	✓	✓	✓	Demand Reduction	As-needed	Stakeholder Workshops, Board meeting, customer communications	NA	**As-Needed**	As-Needed	NA	NA	**0**	**2500**			✓	✓		NA	NA	$0	$0	NA
WKWD-7	**Taft Recycled Water Program**	The Taft Recycled Water Program could potentially generate 423 AFY of tertiary recycled water for Title 22 approved applications.	✓	✓	✓	New Local Supply	As-needed	Stakeholder Workshops, Board meeting, customer communications	Construction permits, General Waste Discharge Requirement Permit,.	**As-Needed**	As-Needed	NA	NA	**423**	**0**	✓		✓	✓		Recycled Water	NA	$14,455,000	$415,000	Rate Payers, Grants
WKWD-8	**Shift Balance of Pumping between North and South Wellfields**	Shifting and balancing pumping between the North Wellfield and South Wellfield entails WKWD increasing the proportion of groundwater pumped at the wellfield that is experiencing the least decline in groundwater levels. This strategy would allow local recovery of groundwater levels in the other wellfield.	✓	✓	✓		As-needed	NA	NA	**As-Needed**	As-Needed	NA	NA	**0**	**0**	✓		✓			NA	NA	$0	$0	NA
WKWD-9	**Implement Permanent Demand Management Measures**	This adaptive management strategy would convert the Response Level 1 actions in the WSRP from voluntary to mandatory. These water restrictions would require a 25 percent reduction in large landscape watering from 2007 levels, prohibit water waste, and reduce non-contracted industrial water use by 15 percent from 2007 levels.	✓	✓	✓	Demand Reduction	As-needed	Stakeholder Workshops, Board meeting, customer communications	NA	**As-Needed**	As-Needed	NA	NA	**0**	**2500**			✓	✓		NA	NA	$0	$0	NA

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" of 0 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

- WKWD-1 Automatic Meter Reading Project - Includes the installation of Automatic Meter Readers on all residential and commercial customers in the WKWD service area, monitoring for leaks and encouraging customers to reduce water consumption through near-real-time data using an on-line monitoring tool

WKWD-2 Buena Vista Recreation Area Water Supply Management Coordination - Includes the coordination with Kern County on the operation and groundwater extractions required for the Buena Vista Recreation Area. Through this coordination, efficiency, demand reduction, and better understanding of future demands may assist the WKWD in reducing long term demands.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation

assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy - The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation

through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry – In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction

fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by WKWD GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the

GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts. Several projects and management actions have been identified and listed "**As Needed**" on Table 3. and could reduce the deficit by up to 5,423 AFY if needed to help maintain the WKWD GSA's Sustainability.

WKWD-5 Continued Balanced Pumping and Recharge – Continued balanced pumping of groundwater and recharge of imported supplies has and will continue to be the operational norm for WKWD. Under this management action, recharge and recovery activity will continue to be monitored closely by WKWD to maintain balanced conditions.

WKWD-6 Implement Water Shortage Response Plan – This adaptive management strategy would implement conservation measured during drought periods for WKWDs customers to reduce demand. This could reduce demands by 2,500 AFY.

WKWD-7 Taft Recycled Water Program – The Taft Recycled Water Program could potentially generate 423 AFY of tertiary recycled water for Title 22 approved applications.

WKWD-8 Shift Balance of Pumping between North and South Wellfields – Shifting and balancing pumping between the North Wellfield and South Wellfield entails WKWD increasing the proportion of groundwater pumped at the wellfield that is experiencing the least decline in groundwater levels. This strategy would allow local recovery of groundwater levels in the other wellfield.

WKWD-9 Implement Permanent Demand Management Measures – This adaptive management strategy would convert the Response Level 1 actions in the WSRP from voluntary to mandatory. These water restrictions would require a 25 percent reduction in large landscape watering from 2007 levels, prohibit water waste, and reduce non-contracted industrial water use by 15 percent from 2007 levels. This action could reduce demand by 2,500 AFY.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on (GSA P/MAs) as: Implemented, Functional, In-Process, or As-Needed.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting process that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9, Appendix N,** WKWD GSA has a Pre-SGMA net water budget surplus of 2,534 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, WKWD GSA has maintained a budget surplus, despite several dry and critically dry years during that time period, by continuing to manage its water supply sustainably. A net positive annual water budget is expected to

continue in coming years through demand reduction and conservation efforts required to meet Water Use Efficiency Standards promulgated in *Making Conservation a California Way of Life regulation*.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).
- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows. For P/MAs that involve water demand reduction, the benefit will be evaluated by comparison of the observed water demand condition (e.g., irrigated acreage, consumptive use) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (WKWD-2 and general operations) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau

of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. If conveyance is available, this surplus CVP water could be delivered from the Friant-Kern Canal through the CVC to WKWD facilities.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. WKWD currently receives SWP water through a water supply contract (Table 1 Entitlement 31,500 AF) with Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. WKWD purchases excess Article 21 water through its State Water Contractor for delivery to existing project recharge facilities using the CVC when such water is available.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion.

WKWD currently receives Kern River water when it is available for water recharge through water service agreements with KCWA.

3rd Party Programs

WKWD has long operated as 3rd party banking program for several Kern County Kern County agencies. Over the past several years more interest has been expressed in participating in WKWD's project for drought protection needs. Most of these programs are structured on a 2:1 basis, meaning for every acre-foot stored for the 3rd party for later drought supply, WKWD receives one for providing banking capacity. These supplies come from the above three identified sources and have provided groundwater supply for WKWD and drought protection for the 3rd party.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Because WKWD is a water district and surface water banking operation, developing additional recharge projects and storage projects outside its project vicinity is not a priority at this time.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The WKWD is a water district that operates a surface water banking project t, and possesses the legal authority to implement P/MAs discussed herein. WKWD GSA is also a GSA, per California Water Code (CWC) § 10725 through 10726.8, the GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 3. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of “one-time” costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 3, and include the following:

- District assessments and/or water charges.
- Grant funding from sources including DWR, United States Bureau of Reclamation (USBR), and CA WISP.

Estimated costs for WKWD GSA P/MA’s by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include “one-time” costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

West Kern Water District GSA	Estimated Costs	
	One-time	Annual
Implemented	$1,500,000	$95,000
Functional		
In-Process	$25,000	$860,000
As-Needed	$14,455,000	$415,000
Total	**$15,980,000**	**$1,370,000**

Management of Recharge and Groundwater Extractions

☑ **23 CCR § 354.44(b)(9)**

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase, water conservation, storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water metering and efficiencies programs, while others can be enacted as needed to reduce demands within the GSA. Through this combination of increased recharge during wet years, demand reduction, coordination, and continued successful sustainable and balanced utilization of groundwater resources, the GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.

Wheeler Ridge-Maricopa GSA
Projects and Management Actions

Goals and Objectives of Projects and Management Actions

☑ 23 CCR § 354.44(a)
☑ 23 CCR § 354.44 (b)(1)(A) and (B)

The objectives of Projects and Management Actions (P/MAs) are to achieve the Kern County Subbasin's (Subbasin) Sustainability Goal through implementation of a glide path that will result in closing the estimated Subbasin groundwater storage deficit of 372,120 acre-feet per year (AFY) under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline, as well as address data gaps and provide for mitigation measures to protect beneficial users.

Each Groundwater Sustainability Agency (GSA) developed P/MA's individually and collectively as a Subbasin. Evaluation of components such as costs, viability, and benefits, was all completed at a GSA level. The coordinated goal of the P/MA Planned Deficit Reduction for each GSA is to meet (with some flexibility) each interim milestone and to eliminate their respective deficit reduction goal by 2040.

The Subbasin GSAs, as it relates to this planning document, have agreed to use a historical supply and demand analysis using a checkbook approach to determine the minimum target P/MA goal for each individual GSA. This is for P/MA planning purposes only, as these values are not considered final, and will be revised during the Basin Study KSB-4. Minimum target P/MA goals for each GSA were calculated using this historical checkbook surface water supply and demand analysis for the 1995-2014 period, then applying an adjustment for estimated climate change which results in increased minimum target P/MA goal above historical levels. These estimates are for P/MA planning purposes only and will be updated in subsequent planning cycles, informed by Basin Study management action KSB-4.

(a) Implementation Glide Path Kern County Subbasin

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address existing overdraft conditions that could trigger Undesirable Results as P/MAs are incrementally implemented to achieve the sustainability goal. While the exact schedule and timetable for implementation of the individual P/MAs is not known at this time, general implementation schedules, also known as a glide path, have been developed as summarized in Table 1 and illustrated on Figure 1. This glide path is aimed to address

25 percent (93,000 AFY) of the projected deficit of 372,000 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the Subbasin as shown in Table 1. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction by 2030 and exceed the 2040 milestone with a safety factor of 2.2, illustrating an extremely high degree of P/MA redundancy. A sensitivity analysis is illustrated on Figure 1 for both 50 percent and 75 percent actual realized benefits from P/MAs. Even if only 50 percent of P/MA benefits are realized, 109 percent of the projected deficit would be eliminated by 2040. Figure 1 and Figure 2 depicts that the Subbasin will rely on 387,000 AFY of demand reduction to mitigate the 372,000 AFY deficit and has identified as-needed projects available for development that would provide an additional estimated 71,000 AFY of deficit reduction capacity, bringing the total safety factor to 2.3 times the planned goal.

Table 1. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)

Kern County Subbasin Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			**-372,000**			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Projected Deficit No P/MA's		**372,000**	**372,000**	**372,000**	**372,000**	**372,000**
Deficit Reduction "Glide Path" Milestones		**-372,000**	**-279,000**	**-186,000**	**-93,000**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement	14,964	28,772	36,835	43,835	45,835
	Demand Reduction	86	61,964	124,714	189,343	258,983
	Ag to Urban Conversion	389	9,189	18,378	26,817	35,256
	Water Conservation-Efficiency	25,099	28,690	28,690	28,690	28,690
	Subtotal	**40,538**	**128,614**	**208,617**	**288,684**	**368,764**
Planned Water Supply Augmentation	Supplemental Water Recharge	34,156	51,887	86,548	89,768	89,768
	Supplemental Water Use	33,060	48,050	55,450	62,350	70,150
	Third-Party Banking	13,713	27,473	28,013	28,013	29,263
	New Local Supply	0	8,000	25,557	114,557	120,107
	Exercise of Rights	104,539	131,308	135,890	135,890	135,890
	Subtotal	**185,468**	**266,718**	**331,458**	**430,578**	**445,178**
P/MA Implementation Schedule*		**226,006**	**395,332**	**540,075**	**719,262**	**813,942**
As-Needed PMA Deficit Benefits		*0*	*550*	*4,800*	*51,826*	*71,645*
Planned P/MA Deficit Reduction Schedule*		**-145,994**	**23,332**	**168,075**	**347,262**	**441,942**

* Implementation Date includes estimated time to start accruing benefits

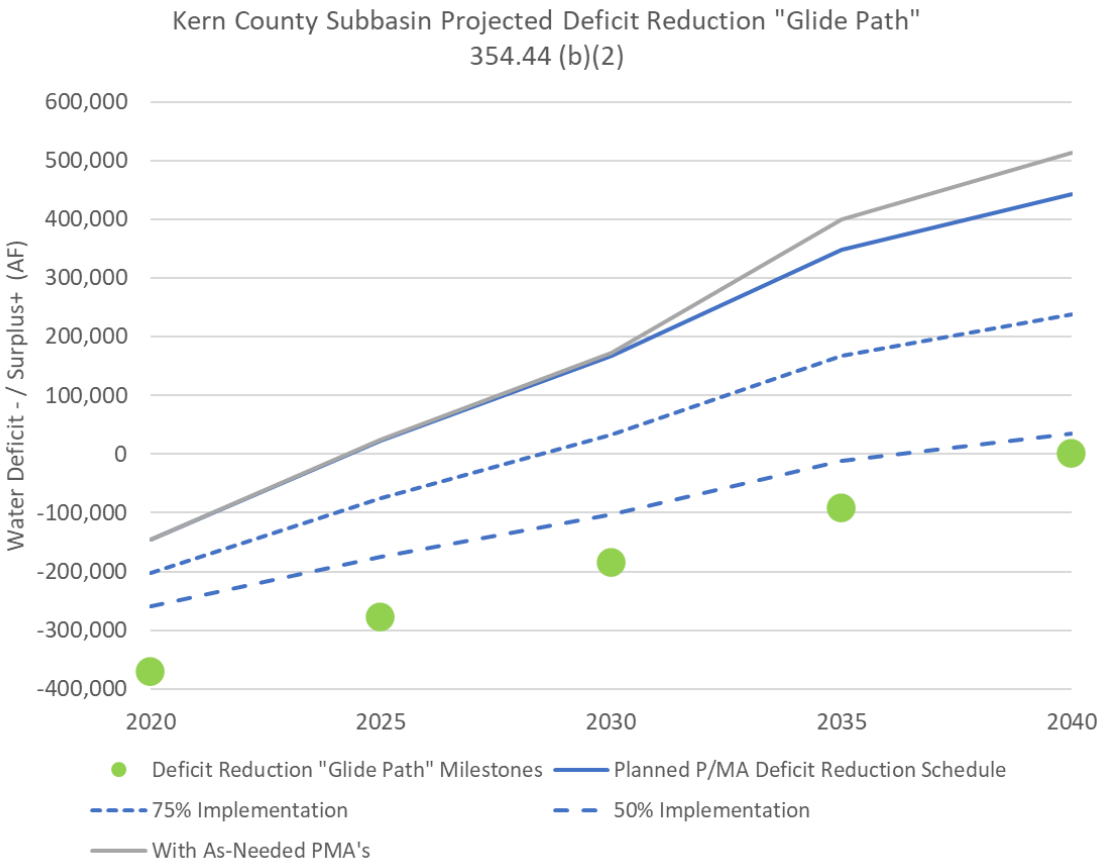


Figure 1. (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

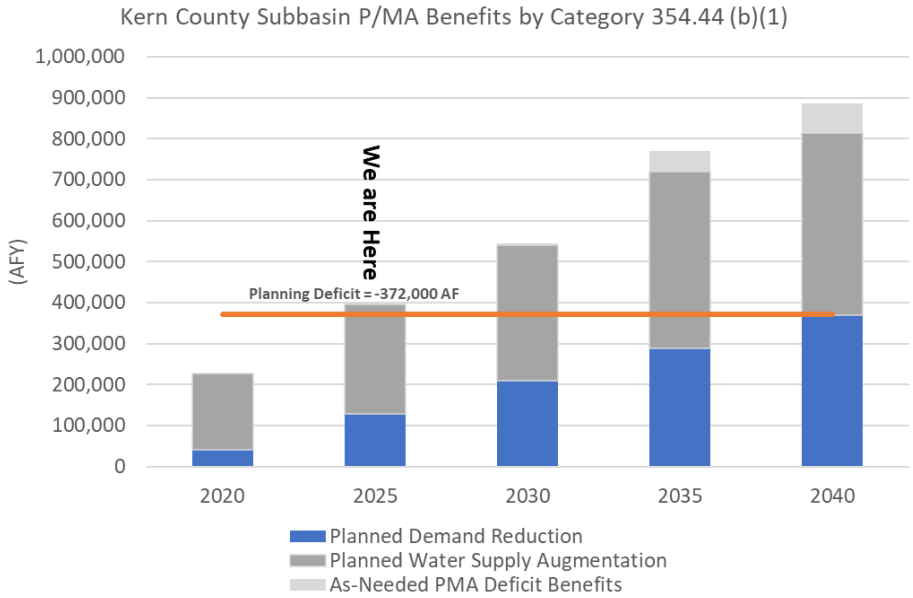


Figure 2. (P/MA by Category)

(b) Implementation Glide Path – Wheeler Ridge-Maricopa GSA

☑ 23 CCR § 354.42(d)

As stated above, the goals and objectives of the P/MAs presented herein are to address any existing or potential Undesirable Results by the GSP implementation deadline for Kern County Subbasin (i.e., by January 2040). As such, P/MAs will be implemented incrementally to achieve this goal. While the schedule and timetable for implementation of all individual P/MAs is not exactly known at this time, general implementation schedules, also known as a "Glide Path," have been developed as summarized for Wheeler-Ridge Maricopa GSA Table 2 below and illustrated on Figure 3. This "Glide Path" is aimed to address 25 percent (3,590 AFY) of the projected deficit of 14,360 AFY during each five-year milestone through 2040, which in turn will affect conditions of the relevant Sustainability Indicators based on the assumption that those conditions are directly related to the balance of supplies and demands within the GSA. The anticipated P/MA implementation schedule is forecasted to exceed the target deficit reduction as early as 2025.

Table 2. (Glide Path – Target Deficit Reduction)

Project and Management Action Implementation Schedule (AFY)						
Wheeler Ridge-Maricopa WSD GSA Projected-Future Scenario Deficit Reduction "Glide Path" 354.44 (b)(2)		**2020**	**2025**	**2030**	**2035**	**2040**
Projected Deficit			-14,360			
Target Deficit Reduction (%)		0	25%	50%	75%	100%
Target Deficit Reduction		**0**	**-3,590**	**-7,180**	**-10,770**	**-14,360**
Deficit Reduction "Glide Path" Milestones		**-14,360**	**-10,770**	**-7,180**	**-3,590**	**0**
Project and Management Action, by Type (AFY)						
Planned Demand Reduction	Land Retirement		10,000	12,500	12,500	12,500
	Demand Reduction		2,000	2,000	2,000	2,000
	Ag to Urban Conversion					
	Water Conservation-Efficiency					
	Subtotal	**0**	**12,000**	**14,500**	**14,500**	**14,500**
Planned Water Supply Augmentation	Supplemental Water Recharge		3,600	5,600	5,600	5,600
	Supplemental Water Use	5,000	5,000	5,000	5,000	5,000
	Third-Party Banking	6,730	6,730	6,730	6,730	6,730
	New Local Supply					
	Exercise of Rights		4,500	4,500	4,500	4,500
	Subtotal	**11,730**	**19,830**	**21,830**	**21,830**	**21,830**
P/MA Implementation Schedule*		**11,730**	**31,830**	**36,330**	**36,330**	**36,330**
Total As-Needed P/MA Deficit Benefits		*0*	*0*	*0*	*31,000*	*31,000*
Planned P/MA Deficit Reduction Schedule*		**-2,630**	**17,470**	**21,970**	**21,970**	**21,970**

* Implementation Date includes estimated time to start accruing benefits

Target = 0

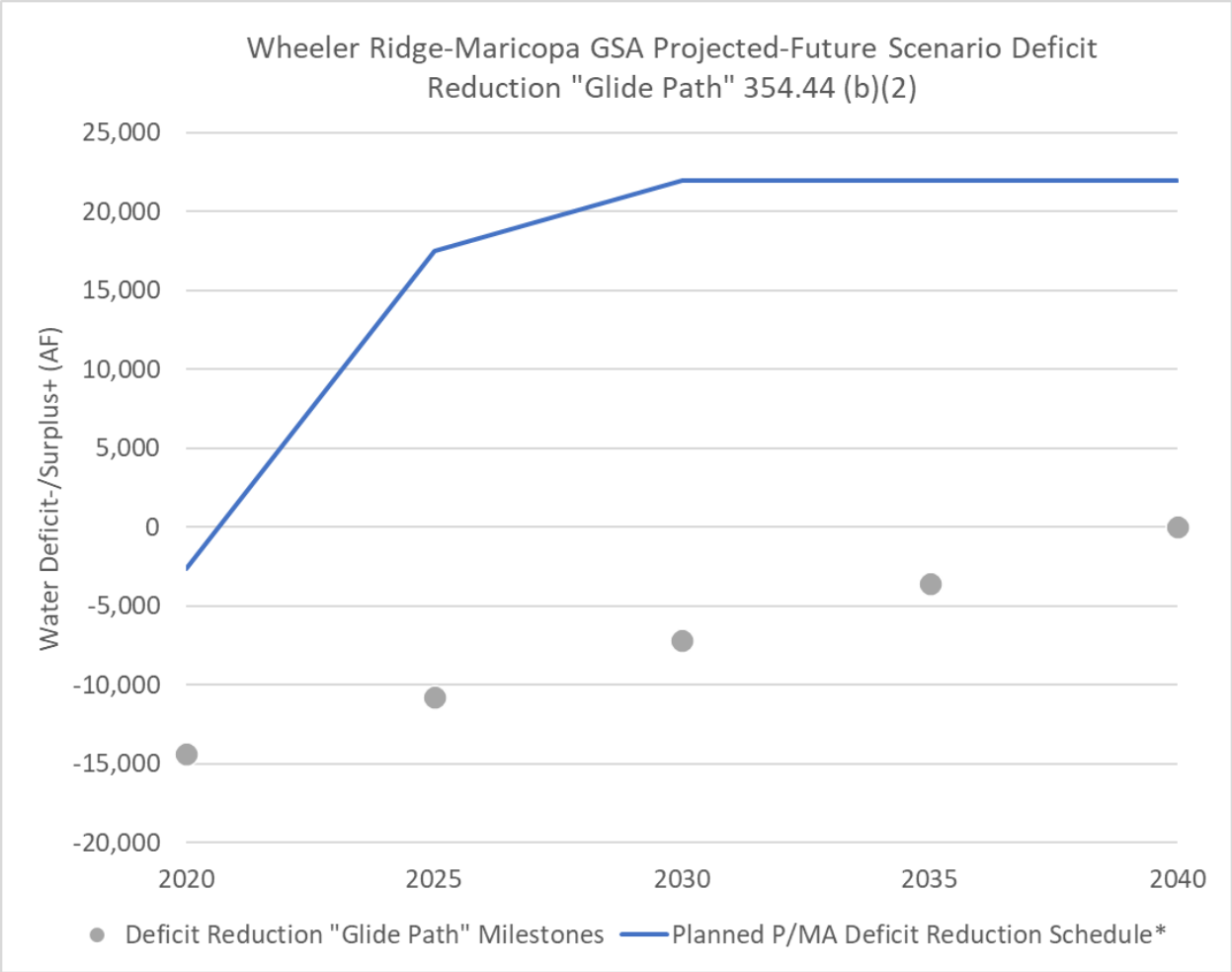


Figure 3. P/MA-5 (Glide Path – P/MA Planned Deficit Reduction vs. Milestones)

List of Projects and Management Actions

§ 354.44. *Projects and Management Actions*

(a) Each Plan shall include a description of the projects and management actions the Agency has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.

(b) Each Plan shall include a description of the projects and management actions that include the following:

(1) A list of projects and management actions proposed in the Plan with a description of the measurable objective that is expected to benefit from the project or management action. The list shall include projects and management actions that may be utilized to meet interim milestones, the exceedance of minimum thresholds, or where undesirable results have occurred or are imminent. The Plan shall include the following:

(A) A description of the circumstances under which projects or management actions shall be implemented, the criteria that would trigger implementation and termination of projects or management actions, and the process by which the Agency shall determine that conditions requiring the implementation of particular projects or management actions have occurred.

(B) The process by which the Agency shall provide notice to the public and other agencies that the implementation of projects or management actions is being considered or has been implemented, including a description of the actions to be taken.

(2) If overdraft conditions are identified through the analysis required by Section 354.18, the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.

(3) A summary of the permitting and regulatory process required for each project and management action.

(4) The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

(5) An explanation of the benefits that are expected to be realized from the project or management action, and how those benefits will be evaluated.

(6) An explanation of how the project or management action will be accomplished. If the projects or management actions rely on water from outside the jurisdiction of the Agency, an explanation of the source and reliability of that water shall be included.

(7) A description of the legal authority required for each project and management action, and the basis for that authority within the Agency.

(8) A description of the estimated cost for each project and management action and a description of how the Agency plans to meet those costs.

(9) A description of the management of groundwater extractions and recharge to ensure that chronic lowering of groundwater levels or depletion of supply during periods of drought is offset by increases in groundwater levels or storage during other periods.

(c) Projects and management actions shall be supported by best available science.

(d) An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions.

P/MAs are numbered with the acronym of the GSA (example WRM-1) if the P/MA is specific to the individual GSA. Subbasin-wide P/MAs are labeled with “KSB-#” which represents P/MAs that all – or nearly all - GSAs are participating in to achieve the Subbasin’s Sustainability Goal. All P/MAs are described in detail on the tables below.

Table 3. (GSA P/MAs)

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Projects		Implemented / Functional / In-Process	As-Needed										Implemented	Functional		In-Process			As-Needed						
WRM-1	**Increase Out-of-District Banking Operations**	Increase size/participation in out-of-District banking facilities (i.e., Kern Water Bank and Pioneer Project). Increased banking of wet year supplies outside of the District would support deliveries of imported water into the District in normal/dry years.	✓	✓		Third-Party Banking	Underway	Regular District Board meetings	CEQA	**Implemented**	Complete	Complete	2020-	**6730**	**0**	✓		✓			Combination of lower Kern River water supplies and article 21	None	$1,000,000	$100,000	District water charges
WRM-2	**Purchase Additional Supplies**	Continue purchase of additional supplies, as available, for banking outside of the District or direct delivery within the District.	✓	✓	✓	Supplemental Water Use	Underway	Regular District Board meetings	CEQA	**Implemented**	Complete	Complete	2020-	**5000**	**0**	✓		✓			Combination of lower Kern River water supplies and article 21	District authority as a Water Storage District	NA	$2,500,000	District water charges
WRM-3	**On-Farm Recharge**	A Landowner Recharge Program was established in April 2023 and pays participating landowners $75/AF to spread certain low-cost water supplies available to WRMWSD on private lands.	✓	✓		Supplemental Water Recharge	Underway	Regular District Board meetings	CEQA	**Implemented**	Complete	Complete	2023-	**3600**	**0**	✓		✓			Combination of lower Kern River water supplies and article 21	None	$0	$1,350,000	District water charges
KSB-1	**Friant-Kern Canal Capacity Mitigation**	1) Collaborate with FWA to develop costs estimates for the Lower Reach Capacity Correction, 2) develop an attribution analysis of post-2020 subsidence impacts, 3) participate in developing a value of water analysis in cooperation with FWA and 4) develop and implement a funding mechanism to pay for post-2020 conveyance impacts on the FKC attributable to subsidence.	✓		✓		Completion of Design and Impact Analysis	Stakeholder Meetings Board Meetings	NA	**Feasibility Study**	NA	2030	2030-	**0**	**0**			✓	✓	✓	NA	None	Unknown	Unknown	GSA Admin Charge
WRM-4	**"Thru Delta" Facility**	Participation in a "Thru Delta" Facility to increase access to contracted (SWP) supplies.	✓	✓	✓	Exercise of Rights	State-led effort underway	Prop 218	CEQA	**Design & Permitting**	Underway	2045	2045-	**5000**	**0**	✓					State Water Project	None	$311,000,000	TBD	District water charges
WRM-5	**In-District Recharge Facilities**	Program to promote private and/or District-owned recharge facilities within the District.	✓	✓		Supplemental Water Recharge	To be implemented upon adoption of GSP	Regular District Board meetings	CEQA	**Feasibility Study**	2023	2030	2030-	**2000**	**0**	✓		✓			Combination of lower Kern River water supplies and article 21	None	$3,200,000	$100,000	District water charges; GSA Admin Charge

WRM-13	**Capture of Imported Water Return Flows from White Wolf Subbasin**	WRMWSD has provided imported water deliveries to landowners within the White Wolf Subbasin. Return flows of imported water flow across the White Wolf Fault into Wheeler-Ridge Maricopa GSA. Wheeler-Ridge Maricopa GSA would capture the proportion of Subbasin inflows attributed to WRMSD's imported water return flows for distribution and use within the surface water service area.	✓			Exercise of Rights	Underway	GSA Board meetings	NA	**Wheeler-Ridge Maricopa GSA has initiated discussions and negotiations with Subbasin GSAs and White Wolf GSA**	2024	2025	2025-	**4500**	**0**						Imported water return flows	None	$0	$0	NA
WRM-6	**Expand District Distribution System**	Project to expand District distribution system into area currently using only private groundwater.	✓	✓	✓	Supplemental Water Use	Upon modification of water service contracts	Regular District Board meetings	CEQA	**Not yet Initiated**	TBD	TBD	TBD	**2000**	**0**	✓		✓			Additional wet-year imported water supplies	District as a water storage authority	$18,000,000	$100,000	District water charges; grants
WRM-7	**Desalination Facilities**	Desalination facilities to allow for use of additional poor quality groundwater for agricultural use, easing demand on principal aquifer.	✓	✓	✓	New Local Supply	Localized pumping lowering GW levels near MT	Regular District Board meetings	CEQA	**Feasibility Study**	TBD	TBD	TBD	**0**	**0**	✓					poor-quality (currently unused) groundwater	None	NA	$2,400,000	District water charges; GSA Admin Charge

P/MA Number	P/MA Name	Summary Description	Relevant Sustainability Indicators Affected			Overdraft Correction Description Category	Circumstances for Implementation	Public Noticing Process	Permitting and Regulatory Process Requirements	Status	Timetable / Circumstances for Initiation	Timetable for Completion	Timetable for Accrual of Expected Benefits	Expected Benefits							Source(s) of Water, if applicable	Legal Authority Required	Estimated Costs		
														Primary (AFY)		Secondary									
			Groundwater Levels & Storage	Groundwater Quality	Land Subsidence									Water Supply Augmentation	Demand Reduction	Water Quality Improvement	Flood Control	Water Management Flexibility / Efficiency	Mitigation Programs	Data Gap Filling/ Monitoring			One-time Costs	Ongoing Costs (per year)	Potential Funding Source(s)
Management Actions		**Implemented** **Functional** **In-Process**	**As-Needed**										**Implemented**	**Functional**		**In-Process**				**As-Needed**					
WRM-8	**Pumping Assessment**	Set policy to implement a pumping assessment to fund purchase of additional supplies, purchase of land for fallowing, and other investments to support SGMA compliance.	✓		✓	Demand Reduction	To be implemented upon adoption of GSP	Prop 218	CEQA	**Implemented**	Complete	Complete	2024-	**0**	**2000**						NA	District authority as a Water Storage District	$200,000	$50,000	District water charges
KSB-2	**Coordination with Groundwater Regulatory Programs**	Coordination with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking MOUs.	✓	✓			When domestic or small community wells require assistance maintaining access to safe and reliable water supplies.	Refer to Subbasin Outreach and Engagement Plan	NA	**Implemented**	NA	2020	2020-	**0**	**0**	✓				✓	NA	NA	$0	$25,000	GSA Admin Charge
KSB-3	**Exceedance Policy**	Subbasin-wide policy to outline what measures are taken if an MT is exceeded (levels, quality, or subsidence). This policy involves the implementation of action plans and notifications to beneficial users.	✓	✓	✓		When an MT exceedance occurs for any sustainability indicator.	NA	NA	**Implemented**	NA	2024	2024-	**0**	**0**				✓	✓	NA		$0	$25,000	GSA Admin Charge
WRM-14	**Well Registry within Close Proximity to the California Aqueduct**	Well registration program that will require all currently existing and future groundwater extraction wells located proximate to the California Aqueduct to be reported to the WRM GSA	✓	✓	✓				NA	**Implemented - Included within the WRMWSD Groundwater Service Charge**	NA	2025-	2025-	**0**	**0**				✓	✓	NA	Authority of a GSA under SGMA to develop and implement a GSP	$0	$25,000	GSA Admin Charge
WRM-15	**Well Extraction Volume Reporting Within Close Proximity to the California Aqueduct**	Well extraction volume reporting program for groundwater extraction wells located proximate to the California Aqueduct. Extractions will need to be metered using either the District's adopted well meter standards or an ET based methodology.	✓	✓	✓				NA	**Implemented Through WRMWSD Groundwater Service Charge**	NA	2025-	2025-	**0**	**0**				✓	✓	NA	Authority of a GSA under SGMA to develop and implement a GSP	$0	$25,000	GSA Admin Charge

KSB-5	**Well Mitigation Program**	Implementation of a well mitigation program to address water level and quality impacts on drinking water. The program provides emergency bottled water, well assessments, hauled water, and well improvements or replacements.	✓				When groundwater management activities impact domestic wells.	Refer to Subbasin Outreach and Engagement Plan	NA	**With the adoption of the GSP in December, the Well Mitigation Plan will be adopted and implemented beginning on January 1, 2025.**	NA	2026	2025-	**0**	**0**				✓		NA	NA	$0	$45,000	GSA Admin Charge
KSB-4	**Coordination with Basin Study**	Coordination with local GSA's to gain a better understanding of the Kern Subbasin and how best to manage for sustainability, native yield, subsurface flow, and evapotranspiration. The further development of the data management system to improve data access and transparency.	✓	✓	✓		Supporting data collection, reviewing and validating results with GSA-specific data.	NA	NA	**Ongoing**	NA	2025	2025-	**0**	**0**					✓	NA	NA	$25,000	$0	GSA Admin Charge
KSB-6	**White Land Demand Management**	Development of governance structure and demand reduction action for Subbasin white lands (lands not within a district or management area). Correct the water supply imbalance by setting water budgets and a linear reduction of 10% per year over the planning period of 2030-2040.	✓	✓	✓	Demand Reduction	Subbasin-wide overdraft correction.	Stakeholder Meetings Board Meetings Hearings Public Outreach & Engagement	NA	**Initiating Development**	NA	2030	2030-	**0**	**20,410**	✓				✓	NA	None	$0	$10,000	GSA Admin Charge
KSB-7	**Well Registry**	An ongoing effort to update and maintain the Subbasin well inventory and translate it into a well registry. Information will be updated and housed within the Subbasin data management system.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2024-	2024-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	GSA Admin Charge
KSB-8	**Consumptive-Use Study**	Maintain and improve existing Subbasin consumptive-use study (ITRC Metric/LandIQ) for accurate estimates of water use by parcel within GSA's.	✓	✓	✓			Refer to Subbasin Outreach and Engagement Plan	NA	**Ongoing**	NA	2020-	2020-	**0**	**0**				✓	✓	NA	NA	$0	$25,000	GSA Admin Charge
KSB-9	**California Aqueduct Subsidence Action Plan**	Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs.	✓		✓		When an subsidence IM/ MT exceedance occurs.	NA	NA	**Ongoing**	In-process	Ongoing													
KSB-10	**RMW Data Gaps**	An assessment of level and quality data gaps identified RMN data gaps for water levels and quality. Identified data gaps will be evaluated and addressed by the end of 2026 as specified in Section 15.	✓	✓	✓	NA	NA	NA	Permitting will be required if new wells need to be drilled	**Ongoing**	NA	2026	2026-	**0**	**0**					✓	NA	NA	Unknown at this time	Unknown at this time	Unknown at this time

WRM-16	**Net Zero Well Drilling Moratorium within Close Proximity to the California Aqueduct**	Net zero well drilling moratorium that would allow for replacement wells, but no new wells (excluding de minimums use) to be installed proximate to the California Aqueduct, resulting in no new groundwater extractions proximate to the California Aqueduct.	✓	✓	✓				NA	**Initiating Development**	NA	2025-	2025-	**0**	**0**				✓	✓	NA	Authority of a GSA under SGMA to develop and implement a GSP	$0	$25,000	GSA Admin Charge
WRM-9	**Groundwater Allocation and Market**	Develop a groundwater pumping allocation methodology, including a market system for trading and/or transferring of allocations.	✓		✓	Demand Reduction	To be implemented upon adoption of GSP	Regular District Board Meetings	CEQA	**By end of WY 2023, allocation policy in early stages of development**	2023	TBD	2035-	**0**	**21000**			✓			NA	Authority of a GSA under SGMA to develop and implement a GSP	$50,000	$50,000	GSA Admin Charge
WRM-10	**Voluntary Pumping Limitation**	Set non-binding pumping limitations in conjunction with a fee for pumping above limits.	✓		✓	Demand Reduction	To be implemented upon adoption of GSP	Prop 218	CEQA	**In coordination with WRM-9**	2023	TBD	2035-	**0**	**0**						NA	Authority of a GSA under SGMA to develop and implement a GSP	$200,000	$50,000	GSA Admin Charge
WRM-11	**Mandatory Pumping Limitation**	Set binding pumping limitations in conjunction with a fee for pumping above limits.	✓		✓	Demand Reduction	if other P/MAs are insufficient	Prop 218	CEQA	**In coordination with WRM-9**	2023	TBD	2035-		**5000**					✓	NA	Authority of a GSA under SGMA to develop and implement a GSP	$200,000	$50,000	GSA Admin Charge
WRM-12	**Land Retirement**	Conversion of ag lands to solar. Purchase and permanently fallow previously irrigated acreage within District to reduce overall water demand and groundwater extractions.	✓		✓	Land Retirement	if other P/MAs are insufficient	Prop 218	CEQA	**Feasibility Study**	2030	TBD	2030-	**0**	**10000 (increase by 2500 after 2030)**						NA	Authority of a GSA under SGMA to develop and implement a GSP	$0	$10,000	GSA Admin Charge

☑ 23 CCR § 354.44(b)(1)

Demand Reduction P/MAs

Demand Reduction P/MAs are the primary means of implementation of a "Glide Path" that will result in closing the currently identified "deficit" of 18,910 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA Specific P/MAs either currently being implemented or which have been implemented or in-process that contribute to water demand reduction include:

WRM-8 Pumping Assessment - Through a recently approved Groundwater Service Charge (GWSC) to be levied on each acre-foot of groundwater extracted for consumptive use within Wheeler Ridge Maricopa Water Storage District (WRMWSD) boundaries, with some exceptions, beginning as early as 2024, an approximately 2,000 AFY demand reduction benefit is expected.

WRM-12 Land Retirement - Through either District or landowner actions, by purchasing and permanently fallowing previously irrigated acreage within District to reduce overall water demand and groundwater extractions, a 10,000 AFY reduction in demand is anticipated, with an increase by 2,500 AFY after 2030.

KSB-9 Targeted P/MAs within Close Proximity to the California Aqueduct - The Subbasin has developed an Action Plan for Subsidence IM & MT Exceedance which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence. WRM GSA has initiated the following management actions in response to measured subsidence along Pools 31 through 35 of the California Aqueduct:

WRM-14 Well Registry within Close Proximity to the California Aqueduct – Implemented through the WRMWSD GSWC to further supplement the Kern County Subbasin Well Registry management action (KSB-7), the WRM GSA will implement a well registration program that will require all currently existing and future groundwater extraction wells located proximate to the California Aqueduct to be reported to the WRM GSA.

WRM-15 Well Extraction Volume Reporting Within Close Proximity to the California Aqueduct - Implemented through the WRMWSD GSWC a well extraction volume reporting program for groundwater extraction wells located proximate to the California Aqueduct. The District has also adopted well meter standards.

WRM-16 Net Zero Well Drilling Moratorium within Close Proximity to the California Aqueduct - The WRM GSA will implement a net zero well drilling moratorium that would allow for replacement wells, but no new wells (excluding de minimums use) to be installed proximate to the California Aqueduct. This management action results in no new groundwater extractions proximate to the California Aqueduct.

KSB-6 White Land Demand Management – The Subbasin is developing a governance structure and demand reduction action for Subbasin white lands (lands not within a

district). As part of the implementation of KSB-6 there would be another round of public outreach to include remaining white land landowners. Previous stakeholder outreach efforts accomplished GSA management of over 150,000 acres of white lands that were absorbed via agreement with various GSAs and managed for sustainability. Approximately 7,200 acres of white lands (less than 1% of the Subbasin) remain currently using groundwater (irrigated agriculture and urban) to have management actions assigned. KSB-5 Basin Study will provide added technical data to support setting water budgets necessary to implement a linear white lands demand reduction schedule of 10 percent per year, estimated at a total of 23,920 AF over the planning period of 2030-2040. Additional details are provided in the Kern Non-District Lands Authority Joint Powers Agreement governance document in **Appendix C-2**. Due to the white land's relatively small groundwater demand, implementing white land demand management in the 2025-2030 period will not preclude the Subbasin's ability to meet its sustainability goal.

Water Supply Augmentation P/MA's

Water Supply Augmentation P/MAs are the secondary means of implementation of a "Glide Path" that will result in closing the balance of the currently identified "deficit" of 18,910 AFY under the 2030 Climate Change Scenario by the January 2040 GSP implementation deadline.

GSA-specific Projects either currently being implemented or have been implemented or in-process that contribute to supply augmentation include:

WRM-1 Increase Out-of-District Banking Operations - Through increasing size and/ or participation in out-of-District banking facilities (i.e., Kern Water Bank and Pioneer Project), the associated increase in banking of wet year supplies outside of the District would support deliveries of imported water into the District in normal/dry years. The estimated average recharge benefit from this project is 9,225 AF/month, or 6,730 AFY.

WRM-2 Purchase Additional Supplies - By continuing to purchase additional supplies, as available, for banking outside of the District or direct delivery within the District, an estimated 5,000 AFY benefit is expected.

WRM-3 On-Farm Recharge - Through establishing the Landowner Recharge Program in April 2023, WRMWSD pays participating landowners $75/AF to spread certain low-cost water supplies available to WRMWSD on private lands not subject to perched water or overlying poor quality groundwater. Through this program, up to an estimated 18,000 AFY of WRMWSD's supply will be recharged through this project in wet years, or 3,600 AFY on average when considering non-wet years.

WRM-4 "Thru Delta" Facility - Participation in a "Thru Delta" Facility will increase access to contracted (SWP) supplies. Participation in the Delta Conveyance Project (DCP) will allow the District to firm up its existing SWP entitlement and may also enable participants to gain access to additional non-firm supplies that can be conveyed through

the Delta. It is estimated that this project could provide up to 25,000 AF of surplus supply upon completion in wet years, or 5,000 AFY on average when considering non-wet years. However, because of delays associated with the DCP, the anticipated benefits from this project are not anticipated to start until at least 2045, and therefore are not currently included in the implementation "Glide Path".

WRM-5 In-District Banking Facilities - Through a program to promote private and/or WRMWSD-owned banking facilities within the District, the District estimates it could recharge up to 10,000 AF in wet years through this program, or 2,000 AFY on average when considering non-wet years.

WRM-13 Capture of Imported Water Return Flows from White Wolf Subbasin - Inflows from the White Wolf Subbasin can be attributed to return flows of imported surface water deliveries by Arvin-Edison Water Storage District (AEWSD) and WRMWSD to landowners within the White Wolf Subbasin. The average benefit of 9,000 AFY will be split equally between AEWSD and WRMWSD (4,500 AFY).

Data-Gap Filling and Mitigation Efforts

To address identified data-gaps, Management Actions either currently being implemented or have been implemented that contribute to data-gap filling and mitigation efforts include:

KSB-1 Friant-Kern Canal Capacity Mitigation – The Kern Subbasin is working to implement this project. Conveyance conditions of the Friant-Kern Canal (FKC) have been impacted by historical subsidence and will potentially be impacted by future subsidence. The Friant Water Authority (FWA) position regarding subsidence along the FKC is that "any unmitigated conveyance loss due to subsidence beyond 2020 would lead to undesirable results." Sustainable management criteria (SMCs) have been established for the FKC that limit subsidence with target average MT rates no more than of 0.1 feet per year (ft/yr) with a maximum 3 feet of cumulative subsidence from 2015 to 2040. Beyond 2040, subsidence is to be minimized with zero inelastic subsidence (including residual subsidence) attributable to groundwater pumping under GSA jurisdiction. To address post-2020 subsidence along the FKC, a mitigation program consisting of raising the sides (liner) of the canal and upgrading associated facilities/infrastructure such as bridge crossings, check structures, wasteways, turnouts, inlet drains, siphons/underdrains, power and telephone and various size pipelines is proposed. The mitigation program will be partially funded by GSAs within the Kern Subbasin, based on the relative impact of post-2020 pumping and groundwater overdraft on subsidence along the FKC. To date, the Kern Subbasin has performed one-dimensional (1D) numerical modeling at selected sites near the FKC in the Kern Subbasin. Results from the 1D numerical modeling will be used jointly with the updated IWFM-Kern model to explore a range of scenarios for establishing the FKC subsidence mitigation cost-sharing framework as part of ongoing work in collaboration with FWA. Separately, FWA is evaluating several Lower Reach Capacity Correction alternatives

including achieving the original design conveyance capacity of 2,500 cubic feet per second (cfs). FWA has performed their own forecast of future subsidence in a reconnaissance-level study (Note: the FWA future subsidence forecast is less than historical rate from 2015 to 2023 used to develop the FKC subsidence minimum threshold and assumes groundwater levels stabilizing quickly during implementation of the 2025 Plan). FWA's position is that the Kern Subbasin GSAs should minimize and mitigate lost conveyance capacity post-2020 due to ongoing subsidence attributable to groundwater pumping under GSA jurisdiction.

As part of this P/MA, the Kern Subbasin would implement the following: (1) participate in a program that monitors and tracks ongoing subsidence regionally within the Kern Subbasin and locally along the FKC, (2) compare observed rates of subsidence to established SMCs along the FKC and take action (i.e. pumping reductions) should future observed subsidence rates exceed interim milestones and the minimum threshold, (3) collaborate with FWA to develop cost estimates for the Lower Reach Capacity Correction and evaluate the degree of post-2020 lost capacity attributable to subsidence, (4) develop an attribution analysis of post-2020 subsidence impacts using either a numerical model to perform predictive analysis or other suitable tool, and (5) develop and implement a funding mechanism based on the subsidence attribution analysis to pay for post-2020 conveyance impacts on the FKC attributable to subsidence. See Appendix G-2 for additional details on the preliminary FKC mitigation assessment, cost-sharing agreement by GSAs for additional data collection and modeling; and progress on subsidence modeling to support FKC mitigation assessments. Appendix G-3 contains a letter of support for the FKC mitigation framework from the FWA.

KSB-2 Coordination with Groundwater Regulatory Programs – The Subbasin will continue to coordinate with various water quality regulatory programs by local, state, and federal agencies. Some of these programs include the Irrigated Lands Regulatory Program, Central Valley Salinity Alternatives for Long-term Sustainability (CV-SALTS), as well as local Groundwater Banking Memorandums of Understanding (MOUs), which mandates the sampling of monitoring wells and adherence to mitigation measures to protect groundwater quality.

KSB-3 Kern Subbasin Exceedance Policy – The Kern Subbasin has prepared the Kern Subbasin Exceedance Policy and Action Plans (Appendix K-1) to outline what measures are taken if an MT is exceeded for groundwater levels, groundwater quality, and/or land subsidence. This P/MA involves the implementation of action plans surrounding investigation into the exceedance, notifications to nearby beneficial users, as appropriate, and the documentation of those activities.

KSB-4 Coordination with Basin Study – The Subbasin has coordinated to perform an updated Basin Study. The work will address data and information gaps and recalibrate the Subbasin model. The update will:

a. Improve the understanding of the groundwater response to the implementation of P/MAs.
b. Develop an improved determination of the input data to address data gaps for Subbasin-wide and local water budgets.
c. Incorporate locally derived hydrogeologic conceptual model data from the Subbasin Plan into the model to better represent subsurface groundwater flow within and out of the Subbasin.
d. Improve model calibration to better simulate groundwater levels with respect to minimum thresholds and measurable objectives.

KSB-5 Well Mitigation Program – The Kern Subbasin has developed and adopted a comprehensive Well Mitigation Program (Appendix G-1) to fund and implement a Subbasin-wide mitigation program starting January 1, 2025. As part of the 2025 Plan, the Well Mitigation Program was further revised to include a specific mitigation program track that applies to Degraded Water Quality. Additional implementation details related to groundwater quality public notification and mitigation are discussed in Appendices K-1 (Action Plan for Degraded Groundwater Quality) and K-2 (Part IV).

In summary, the Well Mitigation Program includes three tracks for mitigation: Track 1 – Dry Well Mitigation; Track 2 – Dry Well Technical Assistance; and, Track 3 - Degraded Water Quality Mitigation. Currently, the GSAs implement Track 1 – Dry Well Mitigation through an agreement with Self-Help Enterprises (SHE), which allows the Kern Subbasin and SHE to coordinate as follows for that Track:

a. Emergency Bottled Water – Upon notice that a domestic well user has lost access to water, SHE distributes 2 weeks worth of bottled drinking water to the household within 24-hours.
b. Well Assessment – SHE staff conduct on-site assessments which includes review of well reports/documentation, confirming water source, checking for running water/water pressure, assessing well depth and water level, inspecting electrical and above-ground components, inspecting any existing tank systems, identifying locations for new tank system placement, and developing a site map.
c. Temporary Tanks and Hauled Water – If necessary, SHE arranges for installation of a tank system and routine delivery of hauled potable water to the site. Repair and maintenance services are provided to the system until removal.
d. Ongoing Bottled Water – SHE coordinates deliveries of ongoing bottled drinking water until a long-term solution is in place.
e. Long-Term Solutions – SHE finances, as provided by the GSAs, well repairs, well replacement, and service connections to nearby water systems (whenever feasible) to restore long-term water access to the home.

For the Degraded Water Quality Mitigation Track, the Kern Subbasin is committed to engage qualified professionals and/or an appropriate contractor/entity (e.g., Self-Help Enterprises) for implementation of the Degraded Water Quality Mitigation Track. The Kern Subbasin is committed to providing financial support for implementation of services such as providing short-term alternative water supplies and implementing long-term solutions for eligible domestic well owners. In the case of nitrate, the Kern Subbasin will seek to work with the Kern Water Collaborative to address interim and long-term solutions for nitrate impacts, as determined appropriate.

KSB-7 Well Registry - In late 2023, the GSAs initiated a Subbasin-wide well inventory that reconciles records from multiple databases to develop an accurate well inventory with verified well uses that is based on available records and field verification surveys (refer to the detailed process description in Section 5.6.1). The completed well inventory will be translated into a well registry based on district records of property owner information. This management action will be an ongoing effort as GSAs continue to update and maintain their well inventory/registry, which will be housed within the Kern Subbasin data management system. At least annually, the Kern Subbasin will update the system using DWR/County well permit information and well surveys.

KSB-8 Consumptive-Use Study – The Subbasin has annually contracted with either Cal Poly's Irrigation Training Research Center and/or LandIQ for monthly evapotranspiration data of the Subbasin for both planning and, in some GSAs, for groundwater extraction fee calculation purposes. The Subbasin will continue this effort and invest in improved technology and processes for improved accuracy.

KSB-9 California Aqueduct Subsidence Action Plan - Targeted P/MAs within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct – The Kern Subbasin has developed an Action Plan for Subsidence Interim Milestone (IM) & Minimum Threshold (MT) Exceedances which requires GSAs to evaluate and initiate targeted P/MAs to reduce GSA-related subsidence (see Sections 8.5 ;13.5.2 and Appendix K). As part of this P/MA, GSAs located within or proximate to the CASP 5-mile wide Monitoring Corridor to the California Aqueduct may initiate targeted P/MAs should future observed subsidence rates exceed IMs and MTs. These targeted P/MAs located within or proximate to the CASP Monitoring Corridor to the California Aqueduct may include: (1) well registry, (2) metered well extraction volume reporting, (3) net zero well drilling moratorium, (4) targeted pumping reductions, and (5) pumping limitations, among others deemed necessary informed by GSA analysis undertaken from the five-step Kern Subbasin Subsidence Action Plan (Appendix K).

KSB-10 RMW Data Gaps - In Section 15, an assessment of the Groundwater Level and Groundwater Quality RMN was conducted to ensure the network was monitoring beneficial users located at different depths. For the Groundwater Level RMN, this analysis yielded representative monitoring network data gaps in three grid hexagons for domestic beneficial users. The groundwater level monitoring assessment also identified seven additional grid hexagons as potential data gaps where GSAs propose to conduct

supplemental monitoring to further assess localized shallow groundwater conditions. The groundwater quality assessment yielded representative monitoring network data gaps in 30 grid hexagons. To address the three Groundwater Level RMN data gaps, the Kern Subbasin will augment the groundwater level monitoring network with one additional well. To address the 30 Groundwater Quality RMN data gaps, the Kern Subbasin anticipates augmenting the groundwater quality monitoring network with up to an additional 30 wells. The timeline for addressing these data gaps with existing wells is one year (end of calendar year 2025). The timeline for addressing these data gaps with a newly constructed well is two years (end of calendar year 2026). This timeframe is required to provide GSAs with adequate time to identify and field vet potential monitoring wells. In cases where no existing wells can be identified or access secured, new monitoring wells will be drilled to address these data gaps. See Section 15.5 for additional details regarding the data gap analysis and filling implementation plan.

Adaptive Management Efforts

To the extent that projects and management actions are unable to prevent Minimum Threshold Exceedances that are caused by Wheeler-Ridge Maricopa GSA activities, further actions will be evaluated and considered as directed by KSB-3 Exceedance Policy attached in Appendix K-1. If either the projects or management actions are unable to produce the projected supplies or other better options are found that prove more cost-effective the GSA may deviate from the actions as described above. At each 5-year planning window, each previously described project and action will be evaluated as well as new ones possibly included. The GSA will enact P/MAs to accomplish at least a linear path to sustainability. Progress on the glide path's implementation will be presented annually via the Kern County Subbasin Annual Report and inform adaptive management efforts.

Several P/MAs have been identified and listed "**As Needed**" on Table 3. (GSA P/MAs) and could reduce the deficit by up to 31,000 AFY if needed, as summarized below:

WRM-6 Expand District Distribution System – The Wheeler-Ridge Maricopa Water Storage District could expand their distribution system to include areas currently using only private groundwater. This expansion could augment supply by 2,000 AFY.

WRM-7 Desalination Facilities – By construction desalinization facilities, additional poor-quality groundwater could be processed and later used for agriculture thereby easing demand from the Primary Alluvial Principal Aquifer. Exact demand reduction is unknown.

WRM-9 Groundwater Allocation and Market – Through development of a groundwater pumping allocation methodology, including a system for trading and transferring allocations, a 21,000 AFY reduction in demand could be realized.

WRM-10 Voluntary Pumping Limitation – By setting a non-binding pumping limitation in conjunction with a fee for pumping above prescribed limits demand could be reduced.

At this time the exact demand reduction quantity is unknown and would be dependent on participation.

WRM-11 Mandatory Pumping Limitation – Through setting a mandatory, binding pumping limitation in conjunction with a fee for pumping above limit, a demand reduction of up to 5,000 AFY could be realized. Mandatory pumping limitations may be initiated along the California Aqueduct within a buffer zone to be determined based on technical analysis as a result of an MT exceedance.

Circumstances for Implementation

☑ 23 CCR § 354.44(b)(1)(A)

As discussed above, an overall P/MA implementation schedule, or preliminary "Glide Path" has been developed as a framework to guide the level of benefits that are planned to be achieved over the GSP implementation period (i.e., until 2040), and further through the SGMA planning and implementation horizon (i.e., through 2070). P/MAs will be implemented in such a way as to meet the "Glide Path" Milestones as a minimum requirement.

P/MAs have been categorized on Table 3 as: **Implemented**, **Functional**, **In-Process**, **or As-Needed**.

Implemented – In anticipation of SGMA several P/MAs had been initiated pre-2020 and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed and are accruing benefits.

Functional – In response to SGMA several P/MAs had been initiated and have since been completed. Several other P/MAs were developed in response to SGMA and have since been completed but are not yet accruing benefits.

In-Process – Other P/MAs are In-Process somewhere between Feasibility and Construction/Implementation. All of the In-Process P/MAs will be implemented except for circumstances such as litigation, failed funding, failed ballot initiatives, or environmental constraints.

As-Needed – As part of the Adaptive Management efforts several P/MAs have been identified in response to Minimum Threshold Exceedances, Failed or diminished P/MA's, new Opportunities, or other unforeseen issues. At each 5-year planning window, these and other P/MAs will be formally evaluated for implementation.

Public Notice Process

☑ 23 CCR § 354.44(b)(1)(B)

Public notice requirements vary for the different P/MAs listed above. Some projects' infrastructure improvements may not require specific public noticing (other than that

related to construction), whereas other management actions that involve, for example, imposition of fees by the GSA, may require public noticing pursuant to Proposition 218 or Proposition 26. In general, GSA meetings are open to the public. In some instances, the P/MAs will also each be subject to California Environmental Quality Act (CEQA) review and other permitting processes that are subject to public notice and review. Additional stakeholder outreach efforts will be conducted prior to and during P/MA implementation, as required by law.

Overdraft Conditions

☑ 23 CCR § 354.44(b)(2)

As discussed in **Section 9**, **Appendix N**, the WRM GSA has a Pre-SGMA net water budget deficit of 14,990 AFY over a 20-year historical period (1995-2014) based on the developed water budget model. This budget model nets out water in storage for other parties and includes groundwater transfers from other, adjacent GSA's areas. For the Post-SGMA period between 2015-2023, the WRM GSA has reduced the deficit by the implementation of several early P/MA's. These efforts resulted in a net water budget deficit of 4,340 AFY for 2015-2023. The P/MA combined portfolio represented herein is expected to result in benefits that will help avoid Undesirable Results and maintain sustainability.

Permitting and Regulatory Process

☑ 23 CCR § 354.44(b)(3)

Permitting and regulatory requirements vary for the different P/MAs depending on whether they are infrastructure projects, recharge projects, demand reduction management actions, and so forth. The various types of permitting and regulatory requirements (not all applicable to every P/MA) include the following, if applicable:

Federal

- National Environmental Policy Act (NEPA) documentation if federal grant funds are used.
- National Pollution Discharge Elimination System (NPDES) stormwater program permit (administered by the California State Water Resources Control Board).

State

- CEQA documentation, including one or more of the following: Initial Study (IS), Categorical Exemption (CE), Negative Declaration (ND), Mitigated Negative Declaration (MND).
- Environmental Impact Report (EIR).

- California State Water Resources Control Board permits and regulations regarding recycled water use, waste discharge, and stormwater capture for recharge.
- California Surface Mining and Reclamation Act (SMARA) regulations.
- California Division of Safety of Dams regulations.

Regional

- San Joaquin Valley Air Pollution Control District (SJVAPCD) permit and regulations.
- Power and Water Resources Pooling Authority (PWRPA).

County/Local

- Encroachment permits – Kern County, local agencies, CalTrans, and others.
- Kern County grading permit.
- Kern County well construction permit.

Specific currently identified permitting and regulatory requirements for each P/MA are listed in Table 3**.** Upon implementation of any P/MA, the regulatory and permitting requirements of the P/MA will be reexamined.

Status and Implementation Timetable

☑ 23 CCR § 354.44(b)(4)

As discussed above in ***Circumstances for Implementation***, P/MAs related to water quantity will be initiated in a manner and sequence that achieves the "Glide Path" level of expected benefits shown in Table 3.

Expected Benefits

☑ 23 CCR § 354.44(b)(5)

The P/MAs have expected benefits related to water quantity. Once a P/MA is implemented, there needs to be a way to evaluate, ideally to quantify, the benefits resulting from that P/MA. How P/MA benefits are evaluated/quantified depends on the P/MA type. For those P/MAs that involve direct supply augmentation, the benefit is quantified directly through the measurement of those flows and corresponding response in water levels. For P/MAs that involve indirect supply augmentation through, for example, increased surface water storage capacity and delivery flexibility, quantification of the benefit will require tracking a comparison of the observed water supply condition (e.g. total imported water) against a hypothetical condition where the P/MA was not in place. For P/MAs that involve water demand reduction, the benefit will be evaluated by

comparison of the observed water demand condition (e.g., irrigated acreage) against a hypothetical condition where the P/MA was not in place. Because it is not possible to determine with certainty what the condition without the P/MA would be like, the quantification of the benefits is inherently uncertain.

As discussed above, although the P/MAs described herein are laid out along a general timetable defined by incremental elimination of water budget deficits (i.e., the "Glide Path"), the goals and objectives of P/MA implementation are informed by a water budget outcome with the hope to ensure that Undesirable Results for relevant Sustainability Indicators are avoided by the end of the SGMA implementation period (i.e., by 2040). For this reason, ultimately the success of the collective implementation of P/MAs will be determined by whether the Sustainability Goal is achieved.

Source and Reliability of Water from Outside the Basin

☑ 23 CCR § 354.44(b)(6)

Potential water supplies that feed water recharge P/MAs (WRM-1, WRM-2, WRM-3, WRM-4, and WRM-5) could come from the following sources:

Central Valley Project

The Central Valley Project (CVP) is a network of dams, power plants, and canals that provides water supply reliability to the Central Valley in periods of drought. The Bureau of Reclamation makes excess non-storable CVP Section 215 flood water available during wet years. Although WRMWSD does not have a contract for CVP, through transfer agreements, WRMWSD has received CVP water in the past.

State Water Project

DWR delivers water to 29 State Water Contractors, including 21 south of the Sacramento River Delta, that are served from the California Aqueduct. State Water Contractors can order water up to their Table A allocation under a given allocation set by DWR, even if the water is not needed in that year, and this excess water can be stored outside the contractor's place of service for future use. WRMWSD has a contract for 197,088 AFY of Table A water from the SWP through the Kern County Water Agency (KCWA), one of the State Water Contractors. During wet hydrologic years, DWR may declare Article 21 water available, which is uncontrolled water that cannot be stored in State reservoirs. Article 21 supplies are available in short duration, and, if conveyance capacity exists, can be purchased, and stored for future use. WRMWSD also purchases excess Article 21 water through its State Water Contractor.

Appropriative Water Rights

Surface water rights, including pre-1914 and post-1914 water rights, are held by water districts and parties throughout California, including Kern River water rights. These

water rights can be transferred to other parties as long as legal users of water are not injured (per Water Code Sections 1706 and 1702). The SWRCB supervises changes to post-1914 water rights, but not pre-1914 water rights. Unregulated Kern River flows are available during wet years when the U.S. Army Corps of Engineers (USACE) conducts mandatory releases of water from Isabella Reservoir for flood control purposes. The Kern River Watermaster records the amount of water released daily from the Isabella Reservoir into the Kern River. During these periods of flooding, releases from the Isabella Reservoir may be available for diversion. WRMWSD has received considerable Kern River supplies through transfers from Kern River water right holders.

The Delta Conveyance Project (WRM-4) relies on pursuing a water right permit and/or amendment from the State Water Resources Control Board (SWRCB), which will provide them legal authority to divert water within certain conditions, for a specific purpose, and use within a specified area.

3rd Party Programs

WRMWSD participates in various water banks including: the Kern Water Bank, Pioneer Project, and the Berrenda Mesa Project, along with several Kern County and outside of Kern County agencies. These supplies come from the above three identified sources and have provided drought protection for WRMWSD.

P/MA Annual Water Benefit Estimate for Groundwater Recharge/Storage Projects

Water banking recharge projects have been designed assuming a wet year occurs every 5 years, with a maximum benefit over 100 days. Water supply augmentation benefits have been calculated as follows:

Annual Water Benefit = estimated infiltration rate ft/day * wetted acres * 100 days operation per year * 20 percent of years being wet.

Legal Authority Required

☑ 23 CCR § 354.44(b)(7)

The WRMWSD is a water storage district, that possesses the legal authority to implement the P/MAs discussed herein. The WRMWSD, with participation by Kern County, is also designated the Wheeler Ridge-Maricopa GSA, per California Water Code (CWC) § 10725 through 10726.8. Wheeler Ridge-Maricopa GSA possesses the legal authority necessary to implement the demand management P/MAs described herein.

Estimated Costs and Plans to Meet Them

☑ 23 CCR § 354.44(b)(8)

Estimated costs for each P/MA are presented in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA. The ongoing costs are associated with O&M and/or costs to otherwise continue implementing a given P/MA. It should be noted that depending on the source and nature of funding for the P/MAs, the one-time costs may or may not be incurred entirely at the beginning of the P/MA; in some instances, loans or other financing options may allow for spreading out of "one-time" costs over time.

Potential sources of funding for the various P/MAs are also presented in Table 4, and include the following:

- WRMWSD funds, generally supported by fees charged to landowners within WRMWSD, including potentially the following:
  - General fund
  - GSA Administrative Charge (implemented in 2024)
  - GSA Pumping Penalties (to be created)
- Grant funding from sources including DWR and others
- Other

Estimated costs for Wheeler-Ridge Maricopa GSA P/MAs by implementation status are summarized in Table 4. The costs are approximate and subject to refinement. These costs include "one-time" costs and ongoing costs. The one-time costs may include capital costs associated with construction, feasibility studies, permitting, environmental (CEQA) compliance, or any other costs required to initiate a given P/MA.

Table 4. (P/MA Cost by Implementation Status)

Wheeler Ridge-Maricopa GSA	Estimated Costs	
	One-time	Annual
Implemented	$1,200,000	$4,145,000
Functional	$0	$0
In-Process	$314,225,000	$185,000
As-Needed	$18,450,000	$2,660,000
Total	**$333,875,000**	**$6,990,000**

Management of Recharge and Groundwater Extractions

☑ 23 CCR § 354.44(b)(9)

As discussed above, one primary means by which deficits will be addressed is through implementing P/MAs that reduce demand and augment supplies from additional outside sources of water, particularly during normal to wet years. Many of the projects discussed herein take advantage of additional wet-year supplies that are assumed to be available as capacity increases. These P/MAs include various direct recharge projects and projects that increase storage capacity and delivery flexibility.

In addition to these supply augmentation projects; the portfolio also includes policy-based management actions aimed at demand reduction. Some of these management actions aim to reduce overall water demand through newly implemented water charges, and others are more specifically focused on reducing groundwater pumping by land retirement and imposed water budgets. The formation of an as-needed groundwater budget program (e.g., WRM-9, WRM-10, WRM-11) would likely include mechanisms to allow for trading or exchange of pumping allocations within designated areas, subject to constraints dictated by groundwater conditions observed within the Monitoring Network and policies developed by the respective Board of Directors. Through this combination of increased recharge during wet years and demand reduction, the Wheeler Ridge-Maricopa GSAs' P/MA efforts will ensure that chronic lowering of groundwater levels and reduction in storage during drought will be offset by increases in groundwater levels and storage during other periods.