

Section 8 Implementation and Monitoring Plans

This section describes the proposed implementation plan, the monitoring required under the continuation of the existing SJBGFP, and the implementation of the recommended alternative—either Alternative 6 or Alternative 10. These alternatives are identical except that Alternative 6 contains an extraction barrier to control seawater intrusion and to generate a new water supply and assumes the SOCOD project is not constructed. Alternative 10 assumes the SOCOD project is built and excludes the extraction barrier.

8.1 Implementation of the Recommended San Juan Basin Groundwater Management and Facilities Plan

Table 8-1 lists the implementation steps for the recommended alternatives, a proposed ten-year implementation plan, and a reconnaissance-level cost estimate up to and excluding construction cost. The intent of Table 8-1 is to characterize the schedule, scope, and cost of activities required to implement the recommended alternatives. This characterization is provided below.

8.1.1 Adaptive Production Management

Adaptive production management will refine the current status quo management plan to comply with the diversion permits held by the CSJC, the SJBA, and the SCWD, and related interagency agreements. It involves the management of groundwater production by the CSJC and the SCWD to prevent or at least minimize seawater intrusion and to what is otherwise available on an annual basis. The SJBA, in its role as the Basin Manager⁴⁰, will set an Annual Safe Yield⁴¹ based on groundwater in storage in the spring of each year and the spring assessment of seawater intrusion. The SJBA will depend on groundwater level and chemistry monitoring and the interpretation of the monitoring data to make its determination. The implementation time frame illustrated in Table 8-1 shows the monitoring occurring each year and the SJBA, acting as the Basin Manager, setting the Annual Safe Yield each year. The time frame also shows the occurrence of a triennial update of the criteria that the SJBA will use to set the Annual Safe Yield. The annual cost, shown in Table 8-1, would be about \$140,000 (current cost of monitoring and reporting) for two out of three years and about \$160,000 in years when the Annual Safe Yield assessment criteria are reviewed and updated (current cost of monitoring and reporting plus cost to review and update tool used by the SJBA to set the Annual Safe Yield).

In the implementation of the recommended alternative, it is proposed to include the groundwater substitution program element within the adaptive production management program element. By replacing the water supplied by private wells with an alternative supply, the SJBA and SCWD will have greater flexibility in complying with their diversion permits in

⁴⁰ Mar 1, 1998 SCWD/SJBA Settlement Agreement provides that the SJBA will establish a Project Committee 10 “Basin Management Committee” which would serve as the “Basin Manager”. The Basin Manager is responsible for determining on an annual basis the amounts of Available Safe Yield (ASY) which can be diverted by SCWD and SJBA from their water rights.

⁴¹ The method to determine ASY is described in Appendix B and is currently implemented by the SJBA.

the near term and when the more aggressive program elements are implemented. The implementation steps include:

- Preliminary engineering to identify all of the private wells and the water demands placed on those wells
- Determine the facilities and operations required to provide those water users a substitute supply
- Assess feasibility
- Complete CEQA documentation
- Finalize agreements with private well owners
- Obtain permits
- Prepare final designs
- Construct conveyance facilities to enable substitute supplies

The implementation of the groundwater substitution program element is proposed to start in year 1 (2013-14) and be completed in year 3 (2015-16). The implementation cost, excluding construction, is estimated to be about \$190,000.

8.1.2 Planning and CEQA Process for the Recommended Alternative

The recommend alternatives contain very complex water management program elements that will require additional investigations to determine their feasibility, their integration into the existing water resource management plans, and their impacts on the environment. This information will evolve in the early engineering and feasibility investigations required for implementation. Some of the program elements in the recommended plan may end up not being feasible as described herein. For planning purposes, it was assumed that a programmatic environmental impact report (PEIR) will be completed. The implementation steps include:

- Conduct CEQA process through the preparation of a draft PEIR for the SJBGFMP
- Prepare application/change petitions for new points of diversion, revised diversion amounts, surface water diversion for recharge, storage and subsequent recovery
- Conduct engineering investigations to develop alternative preliminary designs, determine feasibility, and identify fatal flaws for:
 - Groundwater extraction barrier
 - In-stream stormwater recharge
 - In-stream recycled water recharge and groundwater recycled water reuse

- Finalize and certify programmatic EIR
- Finalize SWRCB application/change petitions

The planning and CEQA process are proposed to occur in years 2 (2014-15) to 4 (2016-17). This phase of the work is estimated to cost about \$1,800,000.

8.1.3 Complete Agreements for SJBA Members Participation, Construction, and Operation

The prior implementation efforts will provide detailed estimates of new yield and associated costs. Agreements will be drafted to define participation by individual SJBA members, their responsibilities in the construction and operations of facilities, their yield allocations, financing arrangements, their cost share, and other arrangements as required to implement the SJBGFM. The effort to prepare implementation agreements is proposed to occur in years 3 (2015-16) to 4 (2016-17). The cost to negotiate and prepare these agreements is projected to be about \$200,000.

8.1.4 Design and Construction

By the end of year 4 (2016-17), all of the planning for the program elements and implementation agreements will have been completed. The time frames and costs (through design) for each program element are summarized below:

- Groundwater extraction barrier
 - The design will take about two years to complete and is assumed to start in year 5 (2017-18)
 - Design and permit acquisition costs are projected to be about \$4,000,000
 - Construction will take about two years
- In-stream stormwater recharge
 - The design will take about a year to complete and is assumed to start in year 5 (2017-18)
 - Design and permit acquisition costs are projected to be about \$150,000
 - Operation of the temporary in-stream recharge facilities will start in year 6 (2018-19)
- In-stream recycled water recharge and groundwater recycled reuse
 - The design will take about two years to complete and is assumed to start in year 5 (2017-18)
 - Design and permit acquisition costs are projected to be about \$4,000,000
 - Construction will take about three years

The permits referred to in this implementation step include all of the permits related to construction and operation exclusive of the SWRCB and the Regional Board. The cost to implement Alternative 6 up to and excluding construction is about \$12 million. The cost to implement Alternative 10 through and excluding construction is about \$8 million.

8.2 Minimum Monitoring Program Required for Implementation of the Recommended SJBGFMP

8.2.1 Background

In early 2003, the SJBA implemented a groundwater, surface water, and vegetation field monitoring program to comply with the conditions outlined in its Permit for Diversion and Use of Water, No. 21074 (Permit 21074), issued by the SWRCB Division of Water Rights in October 2000. The original monitoring program, which was developed in 2001, focused primarily on collecting the data needed to satisfy the monitoring requirements enumerated in Permit 21074. In October 2011, the SWRCB amended Permit 21074 to reflect the results of monitoring performed by the SJBA.

In 2012, WEI was retained to prepare an updated Basin Management Monitoring and Reporting Program to comply with the amended conditions of Permit 21074 and to develop the SJBGFMP. In developing the 2013 SJBGFMP, WEI identified basin management issues requiring specific monitoring activities to be included in 2013 Basin Management Monitoring and Reporting Program in addition to the explicit requirements of Permit 21074. These additional activities required to implement the 2013 SJBGFMP include monitoring and interpretation activities to investigate (1) groundwater storage and net recharge, (2) seawater intrusion, and (3) point-source groundwater contamination from LUSTs. Additional monitoring components can be added to the monitoring plan in subsequent years to address any management issues that arise as the SJBGFMP is implemented and potentially from the Salt and Nutrient Management Plan that is currently being prepared by SOCWA, which will be complete by 2014. The SJBA should anticipate a significant, but as yet undefined, increase in monitoring associated with the recharge of recycled water when that program element is implemented.

The following is a description of each regulatory and basin management issue that should be addressed as part of the Basin Management Monitoring and Reporting Program.

8.2.1.1 Permit 21074 Monitoring and Reporting

Amended Permit 21074 describes, among other things, the groundwater and vegetation monitoring requirements that must be satisfied to evaluate the impacts to groundwater-level elevation, groundwater quality, and riparian vegetation that result from groundwater extractions related to the operation of the SJBA desalter facility at two levels of production: groundwater extractions less than 4,800 acre-ft/yr and groundwater extractions in excess of 4,800 acre-ft/yr. The SJBA anticipates groundwater extractions will exceed 4,800 acre-ft/yr in 2013 and after. Thus, the monitoring program for extractions in excess of 4,800 acre-ft/yr is assumed herein. The explicit monitoring requirements include: (1) quarterly groundwater level monitoring at eight monitoring wells to comply with the DWR California Statewide Groundwater Elevation (CASGEM) program, (2) quarterly groundwater quality monitoring

for Electrical Conductivity (EC) at eight monitoring wells, and (3) monthly monitoring of riparian vegetation health at five monitoring sites along San Juan Creek.

In addition to the explicit monitoring requirements listed in the permit, additional data is needed to satisfy other permit conditions, such as reporting total groundwater extractions from the basin and computing water in storage. The additional data needed to address the permit conditions include groundwater production, total water use, precipitation, groundwater elevation data across the basin, groundwater storage, and TDS and chloride concentrations at wells. A GIS-based storage model was built for the SJBGFMP, and it will be used to estimate groundwater in storage. An annual progress report documenting permit compliance must be submitted each year to the SWRCB by June 30th.

8.2.1.2 Groundwater Storage and Production Management

Through the work performed for the 2013 SJBGFMP, WEI determined that the storage capacity and groundwater in storage were significantly less than has long been reported by the DWR and others studying the basin. The groundwater “yield” estimates developed from the most recent groundwater model developed by the MWDOC for the SOCOD planning work is of limited value because it is based on limited useful groundwater production and groundwater level data. Additional high quality groundwater production and groundwater level data are necessary to calibrate a groundwater model in the near future to improve groundwater yield estimates and thereby improve decision making.

The recommended SJBGFMP includes a program element called Adaptive Production Management. This program element requires an estimate of groundwater storage in the spring of each year. Each year, the SJBA, in its role as the Basin Manager, will use the spring storage estimate and spring groundwater level data to establish an “Available Safe Yield” (ASY) from which the CSJC and SCWD will be allocated an annual production allocation for that year until next spring.⁴²

The SJBA will conduct a regional, comprehensive groundwater-level survey and analysis of the San Juan Basin in the spring and the fall of each year to compute the volume of water in storage and the change in storage between each period (spring to fall, fall to spring, and so on). The spring levels and storage change calculations can be used by the SJBA to determine an appropriate level of pumping until the next spring storage determination. Additionally, the period change in storage and period pumping can be used to estimate the net period inflow to the San Juan Basin. The net period inflow can then be correlated to precipitation and stream discharge measurements to characterize near-term and long-term recharge⁴³. This would be invaluable for future groundwater model calibration.

⁴² An annual Available Safe Yield must be established pursuant to the March 1, 1998 SCWD/SJBA Settlement Agreement.

⁴³ It is anticipated that surface discharge and water quality data at the boundaries of the basin will be available from the monitoring conducted for the SOCWA SNMP.

8.2.1.3 Seawater Intrusion

Preliminary planning simulations done by the MWDOC for the proposed SOCOD project suggest that seawater intrusion is an imminent threat to the basin with the projected groundwater production plans of the SJBA member agencies. To track seawater intrusion into the San Juan Basin, it is critical to begin collecting groundwater level and specific groundwater chemistry data that will help the SJBA to understand the current extent of seawater intrusion.

This monitoring includes sampling groundwater and surface water in the Basin, from the coast to the forebay areas, for intrinsic seawater tracers, including boron, bromide, iodide, and strontium. The CSJC and the SCWD will need to sample their production wells for the same intrinsic seawater tracers. These, or other tracers, will need to be monitored in the future until it is determined from both groundwater level and chemistry data that seawater intrusion will likely not occur or the seawater extraction barrier is implemented and working as designed.

The intrinsic tracers will be monitored across the basin to initially characterize the spatial baseline distribution of these constituents and to identify the most promising set of constituents. This initial period will last two years after which the sampling for intrinsic constituents will be limited to monitoring and production wells from the SCWD Desalter to the coast, unless the data indicate that additional monitoring upgradient of the SCWD Desalter is necessary.

8.2.1.4 Point-Source Groundwater Contamination

Seven point-sources of groundwater contamination from LUST sites have been identified in the San Juan Basin. Contamination by MTBE, has already required the CSJC to incorporate high-cost treatment systems into their municipal water system. As the pumpers in the San Juan Basin continue to increase production over time, there is a concern that the contaminants associated with the various LUST sites could be mobilized and further impact municipal water supplies. We recommend that the SJBA include an annual groundwater-sampling event for volatile organic compounds (VOCs), including MTBE, as part of the monitoring program.

8.2.2 Scope of Work

The following is the scope of work required to implement the recommended monitoring and reporting program described above. The scope of work is designed to rely on groundwater and surface water data collected by others in the basin to the extent possible, supplementing that data with data collected in a field-monitoring program to fill in data gaps. The Basin Management Monitoring and Reporting Program is divided into three tasks: Field Monitoring Program, Data Acquisition and Management, and Reporting. The scope of work that follows is paraphrased from the current monitoring contract issued to WEI for 2013 (see Appendix B) and includes the monitoring required for the implementation of the SJBGFMP over the next year or two. The scope of work for the monitoring program should be reviewed and updated annually, or more frequently if necessary. The objectives, sub-tasks, schedule of implementation, and deliverables for each task are described below.

8.2.2.1 Task 1 –Field Monitoring Program

The objective of the field-monitoring program is to collect data in the field that is not available from the other agencies that monitor the Basin. This task is broken down into four subtasks based on data type and monitoring frequency.

8.2.2.1.1 Task 1.1 Quarterly Groundwater Level Monitoring

Currently, the SJBA has pressure transducers and data loggers installed in eight monitoring wells across the San Juan Basin to continuously record groundwater-level elevations. The data loggers are also equipped to record electrical conductivity (EC). Groundwater elevation and EC data collected from these wells are used for water rights permit compliance reporting, CASGEM reporting, storage management, and seawater intrusion monitoring. Each quarter, the groundwater-level elevation and EC data will be downloaded from the data loggers, manual measurements of depth to groundwater will be made to calibrate the pressure transducers, EC probes will be calibrated, and routine transducer maintenance will be performed. The field data will be processed, checked for quality assurance/quality control (QA/QC) and loaded into a relational database.

8.2.2.1.2 Task 1.2 – Quarterly Groundwater Quality Monitoring

To establish the baseline condition for monitoring seawater intrusion into the Basin, 14 monitoring wells in the San Juan Basin will be sampled on a quarterly basis for a two year period. The quarterly groundwater quality sampling events consist of purging each well, measuring field water quality parameters (e.g. temperature, pH, and EC), and collecting groundwater quality samples for laboratory analysis. Note that groundwater samples will only be tested for VOCs during one of the four quarterly sampling events. Data collected for this task can also be used for the analysis and reporting required by Permit 21074. All field and laboratory data will be processed, checked for QA/QC, and loaded into a relational database.

8.2.2.1.3 Task 1.3 – Surface Water Quality Monitoring

To establish the baseline condition for monitoring seawater intrusion, five surface water sites in the Basin will be sampled twice a year during dry-weather conditions over a two-year period. The field and laboratory data will be processed, checked for QA/QC, and loaded into a relational database.

8.2.2.1.4 Task 1.4 – Vegetation Monitoring

The SJBA's water rights permit requires monthly vegetation monitoring at five sites along San Juan Creek. Monthly vegetation monitoring consists of a biologist visiting five monitoring stations to collect written and photographic records of vegetation health and current climate conditions. The field data will be checked for QA/QC and the photographs will be stored in a project file.

8.2.2.2 Task 2 – Data Acquisition and Management

The objective of this task is to coordinate with and collect data from all public and private entities that collect groundwater, surface water, or climate data in the San Juan Basin. This data will supplement the data generated by the SJBA to satisfy the regulatory reporting

requirements and basin management issues identified herein. At the end of this task, the SJBA will have an updated database through the end of the calendar year.

8.2.2.2.1 Task 2.1 – Data Acquisition from Collecting Agencies

Each public and private entity that participates in the monitoring plan will be contacted on a quarterly basis to collect the relevant data sets (April, July, October, and January). The SCWD, CSJC, and MWDOC will be sent a request, asking that they sample their wells for the intrinsic seawater tracers that are not included as part of their standard analytical testing programs.

8.2.2.2.2 Task 2.2 – Data QA/QC, Processing, and Upload to Relational Database

After each quarterly data collection event, all groundwater, surface water, and climate data will be processed, checked for QA/QC, and loaded into a relational database.

8.2.2.3 Task 3 – Reporting

The objective of this task is to prepare reports and presentations that summarize the data collected in the San Juan Basin during each year.

8.2.2.3.1 Task 3.1 – Water Rights Permit Reporting

A letter report will be prepared and submitted to the SWRCB, summarizing the status of compliance with the requirements of Permit No. 21074. This report will be formatted as a letter report that directly answers the questions posed in the permit.

8.2.2.3.2 Task 3.2 – CASGEM Reporting

The quarterly groundwater level data collected in Task 1.1 will be uploaded to the DWR through the CASGEM online reporting system. Data will be uploaded in April, July, October, and January.

8.2.2.3.3 Task 3.3 – Spring and Fall Storage Estimate and Annual Safe Yield Reports

Two letter reports will be prepared and submitted to the SJBA, summarizing the analysis of storage change, the estimation of net inflow to the San Juan Basin, and a preliminary estimate of the ASY. The first letter report will document the change in storage in the San Juan Basin from fall to spring and will be submitted to the SJBA by May 31. This report will contain an estimate of the ASY, based on the estimated storage in the spring of the current year. The second letter report will document the change in storage in the San Juan Basin from spring to fall and will be submitted to the SJBA by December 30. Both reports will contain an estimate of the net inflow in the prior period.

8.2.2.3.4 Task 3.4 – Seawater Intrusion Monitoring Report

A seawater intrusion monitoring summary report will be prepared at the conclusion of each year of groundwater quality sampling. The report will describe the monitoring program, analyze historical and current year data to establish the baseline condition of the basin as it relates to seawater intrusion, and describe the questions, analytical methods, and ongoing monitoring needed to track seawater intrusion in subsequent years. The first draft monitoring report will be submitted to the SJBA for review and comment by January 2014, and a final report incorporating comments on the draft will be submitted by February 2014.

8.2.2.3.5 Task 3.5 – Presentations to the SJBA Board of Directors

Oral status reports will be presented to the SJBA Board at regular Board meetings.

**Table 8-1
Major Implementation Steps for the Recommended SJBGMP Alternatives 6 and 10¹**

Program Element Feature	Implementation Steps	Ten-Year Implementation Schedule										Annual Implementation Cost by Year Excluding Construction ² (\$1,000)											
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	Total	
Adaptive Production Management												\$260	\$230	\$140	\$160	\$140	\$140	\$160	\$140	\$140	\$160	\$160	\$1,670
	Groundwater level monitoring and the development of groundwater level maps and storage estimates; and groundwater chemistry monitoring to assess state of seawater intrusion and determine if SJBGMP is contributing to degradation																						
	Currently being implemented by the SJBA ³																						
	The SJBA, in its role as "Basin Manager" will establish an annual production amount for the CSJC and the SCWD as required to not interfere with private pumpers, and to ensure sustainable production																						
	The SJBA establishes the Basin Management Committee which is empowered by the March 1998 settlement agreement to set an annual Available Safe Yield																					\$0	
	The SJBA will need to develop and periodically revise a relationship between Available Safe Yield and Spring groundwater storage; the relationship will depend on the then existing production and conveyance facilities																						
	Groundwater substitution																						
	Conduct preliminary design and assess feasibility																					\$50	
	Complete CEQA process																					\$30	
	Finalize agreements with private well owners																					\$40	
	Obtain permits																					\$20	
	Prepare final design																					\$50	
	Construct conveyance facilities to enable substitute supply																						
Planning and CEQA Process												\$0	\$875	\$600	\$325	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1,800
	Conduct CEQA process through the preparation of a draft PEIR																					\$250	
	Prepare application/petition to SWRCB for new points of diversion, new pumping, to divert surface water, store and subsequently recover																						
	Prepare initial application/petition, review with SWRCB staff until application/petition is accepted																					\$100	
	Coordinate with SWRCB to complete process and acquire diversion permits																					\$50	
	Conduct engineering investigations to develop alternative preliminary designs, determine feasibility and to identify fatal flaws																						
	Groundwater extraction barrier																					\$400	
	In-stream stormwater recharge																					\$100	
	In-stream recycled water recharge and groundwater recycled water reuse																					\$800	

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Major Implementation Steps for the Recommended SJBGMP Alternatives 6 and 10¹**

Program Element Feature	Implementation Steps	Ten-Year Implementation Schedule										Annual Implementation Cost by Year Excluding Construction ² (\$1,000)															
		1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	Total					
Finalize and certify PEIR for the SJBGMP															\$50							\$50					
Finalize SWRCB application/petition															\$50							\$50					
Complete Agreements for SJBA Member Participation, Construction and Operation												\$100	\$100													\$200	
Design and Construction												\$0	\$0	\$0	\$0	\$4,150	\$4,000	\$0	\$0	\$0	\$0						\$8,150
Groundwater Extraction Barrier																											
Obtain permits																\$50	\$50					\$100					
Complete design															\$1,900	\$1,900						\$3,800					
Construct extraction barrier																											
In-stream Stormwater Recharge																											
Obtain permits																\$50						\$50					
Complete design															\$100							\$100					
Operate in-stream stormwater recharge																											
In-stream Recycled Water Recharge and Groundwater Recycled Reuse (Indirect Potable Reuse)																											
Obtain permits																\$50	\$50					\$100					
Complete design															\$2,000	\$2,000						\$4,000					
Construct recycled water conveyance, recovery wells and treatment system																											
Totals for Alternative 6												\$260	\$1,105	\$840	\$585	\$4,290	\$4,140	\$160	\$140	\$140	\$160	\$11,820					
Totals for Alternative 10⁴												\$260	\$905	\$640	\$585	\$2,340	\$2,190	\$160	\$140	\$140	\$160	\$7,520					

¹ Alternative 10 contains all the program elements of Alternative 6 except the extraction barrier

² Costs shown in italics total to the cost shown above in the grey bar highlighting the program element.

³ Costs of current program and recommended program for this part of the recommended SJBGMP. Significant additional cost will be incurred with recycled water recharge.

⁴ There could be additional reduced cost in the processing of SWRCB applications and in the CEQA process if the extraction barrier is excluded.