CHAPTER 4
PROJECTS AND MANAGEMENT ACTIONS

4.0 PROJECTS AND MANAGEMENT ACTIONS TO ACHIEVE SUSTAINABILITY GOAL

Standards for Projects and Management Actions

Under the Regulations, the Groundwater Sustainability Plan (GSP, Plan) is to include the following:

1. "Each Plan shall include a description of the projects and management actions the Agency [Groundwater Sustainability Agency (GSA)] has determined will achieve the sustainability goal for the basin, including projects and management actions to respond to changing conditions in the basin.
2. Each Plan shall include a description of the projects and management actions that include the following:
   a. 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:
      i. 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.
      ii. 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.
   b. If overdraft conditions are identified through the analysis required by California Code of Regulations (CCR) Section 354.18 [Water Budget], the Plan shall describe projects or management actions, including a quantification of demand reduction or other methods, for the mitigation of overdraft.
   c. A summary of the permitting and regulatory process required for each project and management action.
   d. The status of each project and management action, including a time-table for expected initiation and completion, and the accrual of expected benefits.

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

f. 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.

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

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

i. 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.

3. Projects and management actions shall be supported by best available information and best available science.

4. An Agency shall take into account the level of uncertainty associated with the basin setting when developing projects or management actions" (CCR Section 354.44).

Further, a GSA "has and may use the powers [in the Sustainable Groundwater Management Act (SGMA)] to provide the maximum degree of local control and flexibility consistent with the sustainability goals of [SGMA]" (California Water Code (CWC), Section 10725(b)). "A groundwater sustainability agency may perform any act necessary or proper to carry out the purposes of [SGMA]" (CWC, Section 10725.2(a)).

4.1 INTRODUCTION TO PROJECTS AND MANAGEMENT ACTIONS

Projects and management actions (PMAs) have been developed to address sustainability goals, measurable objectives, and undesirable results identified for the Borrego Springs Subbasin (Subbasin), with a view towards reducing the potential socioeconomic impacts associated with actions required to sustainably manage the Subbasin. The applicable undesirable results are chronic lowering of groundwater levels, reduction of groundwater storage, and degradation of water quality as explained in Section 3.2, Undesirable Results. In addition, groundwater dependent ecosystems (GDEs), which suffered significant and unreasonable adverse impacts well before January 1, 2015 (CWC, Section 10727.2(b)(4), were also evaluated, quantified, and considered.

The PMAs have been selected and developed with consideration of the arid climate that affords few opportunities for capture of excess precipitation. The Subbasin is remote to potential sources of imported water and totally dependent on groundwater for its water supply as described in Section 2.2.3.8, Surface Water Available for Groundwater Recharge or In-Lieu Use. In addition, water uses by volume within the Subbasin are primarily for agriculture and recreation with lesser amounts for municipal, domestic and industrial uses as described in Section 2.1.4, Beneficial Uses and Users. Water quality degradation is attributable to overlying land uses and the mobilization of naturally occurring contaminants from the underlying geologic formations as described in Section 3.2.4, Degraded Water Quality – Undesirable Results. Finally, the magnitude of the overdraft, estimated to be almost 400% above sustainable yield, is a primary factor in the selection of PMAs and the degree to which they will need to be implemented to achieve Subbasin sustainability.

The PMAs determined to achieve the sustainability goals for the Subbasin are: (1) Water Trading Program, (2) Water Conservation, (3) Pumping Reduction Program, (4) Voluntary Fallowing of Agricultural Land, (5) Water Quality Optimization, and (6) Intra-Subbasin Water Transfers. These proposed PMAs have been developed using preexisting basin studies and vetted through a public outreach and agency collaboration process as described in Section 2.1.5, Notice and Communication.

The identified PMAs are interrelated in many respects and the benefits of each may be augmented by co-implementation. The following are prospective examples of interrelated PMA benefits:

- PMA No. 1 – Water Trading Program incentivizes PMA No. 2 – Water Conservation.
- Water use reductions from PMA No. 3 – Pumping Reduction Program and PMA No. 4 – Voluntary Fallowing of Agricultural Land may mitigate groundwater quality as part of PMA No. 5 – Water Quality Optimization.
- PMA No. 6 – Intra-Subbasin Water Transfers may be used to match water quality to its potable and non-potable beneficial uses in accordance with PMA No. 5 – Water Quality Optimization.

4.2 PROJECTS AND MANAGEMENT ACTION NO. 1 – WATER TRADING PROGRAM

In 2005, the Borrego Water District (BWD) implemented a water credits program as described in Section 2.1.2, Water Resources Monitoring and Management Programs, that assigned a water allocation for fallowing of primarily agricultural land based on crop or turf type and allowed for water credits to be transferred to new development to offset water demand. The program was initiated in response to overdraft conditions within the groundwater basin and was designed to encourage water conservation and reduce high water consumptive land uses.

4.2.1 Water Trading Program Description

The GSP Water Trading Program will have a similar intent as the existing Water Credit Program but be informed by the pumping allocations developed in conjunction with the GSP, and the estimated sustainable yield of the Subbasin, and be administered by the GSA. The program will enable permanent transfer and potentially long-term or short-term lease of baseline pumping allocations (BPA) (as reduced over time per PMA No. 3) and may replace the existing Water Credits Program. The program is intended to allow groundwater users or new development to purchase needed groundwater allocation from others to maintain economic activities in the Subbasin, encourage and incentivize water conservation, and facilitate adjustment of pumping allocations as water demands and basin conditions fluctuate during the 20-year GSP implementation period.

Upon adoption and implementation of the Water Trading Program, the GSA will allocate a specific amount of allowable groundwater use (pumping allowance) to non-*de minimis* pumpers consistent with the finalized BPA (see PMA No. 3 – Pumping Reduction Program). Each year during GSP implementation, the GSA will publish the annual pumping allowance as a percentage of the BPA (e.g., in year five of the GSP implementation period, the pumping allowance is anticipated to be set at approximately 81% of the BPA using annual reductions through 2040 to reach the target sustainability of 5,700 acre-feet per year (AFY) for the Subbasin as a whole). Every 5 years, the GSA is required to report progress toward achieving the Subbasin's sustainability goals to Department of Water Resources (DWR). Non-*de minimis* pumpers may be able to privately negotiate the sale of all or a portion of their pumping allowance with willing purchasers, within the confines of the Water Trading Program and rules developed for the program. Upon agreement, a proposed trade would be submitted to the GSA for review and approval, or separate mechanisms may be established regarding trades. If approved, the shareholder parties would be notified, the trade certified, and the GSA would update the official, publicly accessible register to notate the trade and the updated annual pumping allowances.

The GSA will agree upon and approve details of the Water Trading Program which may include either temporary or permanent water transfers, or both. Each user's pumping allowance will represent and entitle the user to extract a specific volume of groundwater over time, adjusted commensurate with the pumping reduction schedule developed by the GSA and where applicable, water trading between non-*de minimis* pumpers. The water trade review process by the GSA is intended to be structured to prevent unintended consequences, such as hoarding, collusion, or speculation. For example, to prevent hoarding, the GSA could cap the BPA held by an individual at a maximum percentage of the total BPA allocated to all users in the Subbasin. If warranted, the Water Trading Program Policy and/or rules will be reviewed annually during GSP review, and updated as needed to address unintended consequences or other unanticipated program deficiencies.

Summary of Process to Adopt Program and How Program Will be Accomplished

The anticipated development approach of the Water Trading Program by the GSA is as follows:

- Identify stakeholders/participants and conduct interviews and meetings to receive input and identify concerns to be addressed in program development.
- Evaluate existing programs in other basins and guidance from the DWR.

- Identify potential unintended consequences of the Water Trading Program to be addressed in development of governing documents (e.g., hoarding, speculation, price fixing, collusion, etc.).
- Present findings of the interviews and provide recommendations to the GSA.
- Develop a consolidation/replacement plan for the replacement of existing groundwater restrictive easements and Water Credits Program.
- Draft preliminary regulations for the Water Trading Program (e.g., allowable frequency and amount of water to be traded), allowable water uses (e.g., Area of Origin restriction as described in Section 4.2.2), fees and penalties requirements, accounting scope, etc.
- Collaborate with non-*de minimis* pumpers and GSA to develop Water Trading Program.
- Develop a governing structure for water trades and program administration.
- Develop an enforcement structure.
- Develop and test an accounting/register system to track BPA, pumping allowance, water trades and compliance though metering of groundwater production.
- Determine applicability of California Environmental Quality Act (CEQA) review to Water Trading Program.
- Finalize the details of the initial Water Trading Program into a comprehensive Water Trading Program Policy document to be approved by the GSA.
- Adopt Water Trading Program implementing regulations.

Legal Authority and Regulatory Process

It is the established policy of the State of California "to facilitate the voluntary transfer of water and water rights where consistent with the public welfare" (CWC, Section 109(a)). "The Legislature hereby finds and declares that voluntary water transfers between water users can result in a more efficient use of water, benefitting both the buyer and the seller" (CWC, Section 475). To these ends, BWD has previously duly adopted and implemented a Demand Offset Mitigation Water Credits Policy. That policy has been implemented under the umbrella of a 2013 Memorandum of Agreement between the BWD and the County of San Diego Regarding Water Credits and Section 67.720 (Chapter 7) of the County Groundwater Ordinances. Thus, in addition to the authority described as follows, each of the members of the GSA has independent legal authority to implement water transfer programs in their respective jurisdictions under existing law and they have done so.

Under SGMA, the GSA has authority to "authorize temporary and permanent transfers of groundwater extraction allocations within the [GSA's] boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the [GSP]" CWC, Section 10726.4(a)(3). The GSA also has authority to "provide for a program of voluntary fallowing of agricultural lands or validate an existing program" (CWC, Section 10726.2(c)).

The Water Trading Program identified in this chapter carries forward the policy of the state and satisfies SGMA requirements by establishing a voluntary program that encourages water within the Subbasin to be transferred to beneficial uses of water in a manner designed to achieve the sustainability goals and to protect against undesirable results. The Water Trading Program is expected to operate in parallel with the Voluntary Fallowing of Agricultural Land Program described in Section 4.5, Projects and Management Action No. 4 – Voluntary Fallowing of Agricultural Land.

4.2.2 Water Trading Program Relationship to Sustainability Criteria

The Water Trading Program is intended to avoid undesirable results in the Subbasin by providing incentives for water conservation, the transfer of water to other beneficial uses and the reduction of water intensive land uses. The Water Trading Program will be implemented in a manner consistent with the baseline production allocations and the schedule of ramp downs necessary to achieve the sustainability objectives developed for the GSP. This program will help achieve stabilization of groundwater levels and groundwater in storage, and potentially limit water quality degradation.

Relationship to Measurable Objectives

The Water Trading Program primarily provides for the potential voluntary reallocation of available water supplies to other beneficial uses of water. Reallocation of available water supplies may result in changes to the existing distribution of pumping in the Subbasin that could result in direct effects primarily to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives. The Water Trading Policy will explicitly consider the direct effects to measurable objectives when evaluating proposed water trades. For instance, an area of origin of pumping requirement (i.e., North Management Area) may be required for trades. PMA No. 6 – Intra-Subbasin Transfers is being evaluated to address and optimize the distribution of pumping in the Subbasin as a result of implementation of PMAs.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the Water Trading Program may result in direct, positive effects primarily to the chronic lowering of groundwater levels and reduction of groundwater in storage minimum thresholds. The Water Trading Policy will explicitly consider the direct effects to minimum thresholds when evaluating proposed water trades.

4.2.3 Expected Benefits of the Water Trading Program

The Water Trading Program will provide an economic incentive for conserving water and promoting beneficial uses of water and land uses by providing for the potential to monetize voluntary water conservation or the elimination of water intensive uses. For example, the Water Trading Program provides the ability for replacement of water intensive crop types with other land uses such as residential development, lower water use hydroponics, or solar projects. It may also encourage restoration of land for use as open or recreational space in accordance with the Voluntary Fallowing of Agricultural Land Program (see Section 4.5). It may also serve to shift pumping from areas and aquifers of depressed groundwater levels or poorer quality groundwater to those more favorable for additional pumping. PMA No. 5 – Water Quality Optimization and PMA No. 6 – Intra-Subbasin Water Transfers have been selected to evaluate and mitigate the potential effects of shifting pumping in the Subbasin (see Sections 4.6 and 4.7).

4.2.4 Timetable for Implementation of the Water Trading Program

Preparation of the Water Trading and Policy document is intended to begin upon adoption of the GSP and the appropriate CEQA review (if needed). It is anticipated that development of the Water Trading Program will require approximately six to nine months to conduct the appropriate stakeholder outreach, draft the policy development, public comment, legal review, accounting system development, and finalization of an initial Water Trading Program Policy. The timetable for implementation of the Water Trading Program is dependent on the schedule to complete CEQA review should it be determined that implementation of the program requires CEQA review.

4.2.5 Metrics for Evaluation of Water Trading Program Effectiveness

The Water Trading Program will include both direct and indirect metrics to evaluate its effectiveness. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are potentially the most representative metric to evaluate Program effectiveness. Additionally, comparison of metered or estimated historical water use versus metered water use after GSP adoption is integral to implement the program. Pursuant to the Metering Plan, all non-*de minimis* groundwater extractors will be required to register their wells during GSP implementation and report metered production data. In addition, BPA, pumping reduction, temporary or permanent water trades, voluntary fallowing of agricultural land and other land use changes will be documented. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Water Trading Program as shown in Table 4-1.

Table 4-1
Metrics for Evaluating Water Trading Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 1	Water Trading Program	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Baseline pumping allocation (BPA) 5. Pumping reduction (ramp down) 6. Water trades 7. Area of irrigated land and crop type 8. Used and unused BPA	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost

Notes: PMA = Projects and Management Action.

4.2.6 Economic Factors and Funding Sources for Water Trading Program

Planning-level development cost for establishing the Water Trading Program is estimated to be approximately $122,000 and separate from development of this GSP.

As part of consideration and adoption of the Water Transfer Program Policy and/or rules, transaction fees or other form of participation fees will be considered in order to support and implement the program. State grant funding may be available for capital or planning expenditures. Other potential sources of funding for the Water Trading Program components include pumping fees, application fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6, Funding Sources.

4.2.7 Water Trading Program Uncertainty

Elements of uncertainty associated with the Water Trading Program include the impact of voluntary fallowing of agricultural land and changing land use to the overall economy of the Subbasin, the relationship of the program to existing property and water rights, and how program compliance will be enforced. It is anticipated that program design and stakeholder outreach will reduce this level of uncertainty.

4.3 PROJECTS AND MANAGEMENT ACTION NO. 2 – WATER CONSERVATION

The BWD has historically implemented measures to encourage efficient water use. These include a tiered water rate structure and other incentive programs (BWD 2009). In the past, rebate programs were established for purchase of low flow toilets, low water use washing machines, and high water use turf removal. Additionally, the BWD provided rate payer irrigation system audits and may pay a portion of recommended irrigation system improvements as described in Section 2.1.2, Water Resource Monitoring and Management Programs. The Borrego Springs Community Plan (County

2013) includes a policy requiring the continuation of "…aggressive, multi-faceted water conservation programs to reduce existing agricultural, golf course, commercial and residential [water] use."

The agricultural sector has made significant investment in end use efficiency technologies such as drip irrigation. Some golf courses have invested in control technologies to optimize the timing and application of irrigation. Use of lower water demand native plants has also been incorporated into non-turf areas for some of the golf courses. BWD has also adopted a water conservation (shortage) policy (BWD 2018). In addition, the County of San Diego adopted and enforces an ordinance containing groundwater use reduction measures for new development. San Diego County Code of Regulatory Ordinances (County Code) Section 67.720.

4.3.1 Water Conservation Program Description

The GSP Water Conservation Program would consist of separate components for the three primary sectors: agricultural, municipal, and recreation. Programs for each sector would follow a similar approach consisting of reviewing historical programs and projects, identifying areas and methods for greatest potential water savings, outreach and coordination with potential participants, developing project cost estimates, competitively evaluating project alternatives implementing projects, and acquiring follow-up metrics.

Legal Authority and Regulatory Process

California Constitution Article X, Section 2 and CWC Section 100 provide that because of conditions prevailing in the state, it is the declared policy of the state that the general welfare requires that the water resources of the state shall be put to beneficial use to the fullest extent of which they are capable, the waste or unreasonable use of water shall be prevented, and the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and the public welfare.

Additionally, in May 2016, Governor Brown signed Executive Order B-37-16 that set a policy of making water conservation a California way of life and ordered state agencies to establish permanent changes so Californians use water more efficiently. It set a framework for moving the state from temporary, emergency water conservation measures to a more permanent approach customized to the unique local conditions. In April 2017, DWR, the State Water Resources Control Board, the California Public Utilities Commission, the California Department of Food and Agriculture, and the California Energy Commission issued a report entitled "Making Water Conservation a California Way of Life, Implementing Executive Order B-37-16" to establish a long-term framework for water conservation and drought planning (DWR et al. 2017).

In May 2018, Governor Brown signed Senate Bill 606 and Assembly Bill 1668, which stem from the Governor's Executive Order and report to implement it. The legislation establishes a foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts. Most of the legislation applies to conservation measures for urban water suppliers, but the legislation recognizes that small water suppliers and rural communities require guidance from the state to improve drought and conservation planning (CWC, Section 10609.40.) Accordingly, DWR and the State Water Resources Control Board must propose to the Governor and Legislature by January 1, 2020, recommendations and guidance relating to the development and implementation of countywide drought and water shortage contingency plans to address the planning needs of small water suppliers and rural communities (CWC, Section 10609.42). The County and thus the GSA may be able to adopt additional conservation measures that result from the forthcoming recommendations.

The State of California has set standards for water efficiency in landscaping since 1990. These requirements are currently set forth in the Water Conservation in Landscaping Act, Government Code Sections 65591 et seq. The DWR adopted and periodically amended a Model Water Efficient Landscape Ordinance (MWELO). The MWELO is currently codified in Title 23 CCR Sections 490 et seq. The County is at all times required to adopt an ordinance as effective as the MWELO at conserving water or apply the MWELO. The County adopted and has enforced its own water efficient landscape regulations since the first MWELO became effective on January l, 1993. In response to prolonged drought conditions in the state, Governor Brown, by Executive Order B-29-15 issued April l, 2015, directed the DWR to amend the MWELO to increase water efficiency standards for new and existing landscapes and to limit the use of turf. The DWR revised the MWELO in accordance with the Executive Order and the California Water Commission approved the revised MWELO on July 15, 2015. Consistent with the requirements of the Water Conservation in Landscaping Act, the County amended its water efficient landscape requirements set forth at Sections 86.701 et seq. of the County Code to ensure that the County's requirements are as effective as the current MWELO at conserving water.

Public noticing will be an integral part of the conservation program implementation. To be most effective, the availability of optional water conservation program services such as water audits and rebate programs will be widely advertised through billing inserts, websites, or mailings to BWD customers and other members of the public. In addition, water conservation outreach will be discussed at public meetings conducted by the GSA.

Agricultural Sector

Agricultural extractions from the Subbasin are estimated to be about 15,749 AFY based on the BPA making agriculture the largest potential sector for water savings in the Subbasin. Potential agricultural water savings are from reduction of applied water to crops, planting lower water use crops and/or increased efficiency of irrigation systems. Efficiencies in fertilizer or pesticide use can serve to limit degradation of groundwater quality potentially caused by agricultural return flows. The primary element of the agricultural conservation program will be water audits to be performed by the GSA or third-party contractors such as the Resource Conservation District of Greater San Diego County, which may have the following components:

- Pre-audit analysis of historical water use, topography, climate data, and land use
- Analysis of distribution uniformity (amount of water supplied by irrigation system to each plant), crop density, and crop types
- Analysis of irrigation efficiency (amount of water used beneficially by crop compared to the total water applied)
- Analysis of soil grain size and texture, agronomic soil suitability including salinity, drainage, and water retention properties
- Analysis of irrigation system water use efficiency, pressure, and maintenance
- Pesticide and fertilizer application and use
- A report containing recommendations for improving efficiency and crop yield
- Follow up analysis of measures implemented actions/practices and savings obtained

The steps to implement the audit program will consist of the following:

1. Historical project analysis – Compile and analyze information from previously conducted audit programs and estimate cost and water savings achieved
2. Analysis of potential acreage, land use, and water savings – Geographic information systems (GIS) analysis of Subbasin agriculture, land use, and property ownership in order to determine scope and design of program and to target appropriate landowners for outreach efforts
3. Program design – Design and select program components based on crop types, program cost, and potential water savings; may include irrigation audits, equipment rebates, and cost sharing
4. Program Outreach – Contact, inform, and coordinate with potential program participants to determine needs and constraints
5. Conduct Audits – Each audit will include a report documenting "pre" conditions, recommendations for implementing water savings measures, and potential quantified benefits
6. Follow up on Audit Results – Return to each audit location after a suitable amount of time to document recommendations implemented and other metrics

Municipal Sector

Approximately 1,700 AFY of water is currently supplied for municipal purposes within the Subbasin and about 75% of that is used out of doors. Therefore, outdoor water use has great potential for municipal water savings. There is potential for water savings associated with turf removal or replacement and irrigation system upgrades for homeowner associations (HOAs). However, indoor conservation measures will be implemented to raise awareness of the value of the resource as well as for the water savings they provide.

Potential programs to be included in the municipal water conservation sector include landscape irrigation audits, rebates for turf replacement, efficient landscape irrigation equipment and indoor water fixtures. Smart irrigation controllers may be encouraged in order to automatically adjust landscape irrigation based on real-time, local weather conditions. A BWD and/or GSA-dedicated water conservation website would give water users voluntary access to free water conservation information such as a landscape watering calculator, a watering index, and a water efficient plant database. See the San Diego County Water Authority conservation website for example projects and programs (https://www.watersmartsd.org/tools).

The BWD and/or GSA may sponsor an accreditation program for gardeners and landscapers that complete a training program that may include water efficiency, green waste reduction, pesticide reduction, and fertilizer management. The individuals and companies that receive certification may be included in a conservation website list, to be contacted by those interested in hiring "environmentally responsible" landscaping professionals. Professionals could include those primarily employed in the agricultural sector as part of a job retraining program.

The following steps will be conducted as part of implementation of the Municipal water conservation program:

- A conservation and efficiency analysis will be performed to identify Best Management Practices for water conservation for residential and commercial stakeholders.
- The scope, feasibility, and impact of a landscape restrictive ordinance for existing development will be evaluated in addition to water efficient landscape requirements set forth at Section 86.701 et seq. of the County Code for new development.
- Determination of the applicability of conservation requirements for existing water users (BWD Conservation Program) versus new development (i.e., County water efficient landscape requirements).
- The nature of a potential conservation incentive program will be evaluated, which may include incentives for turf removal, installation of efficient water fixtures, etc.
- Development of an updated program to provide voluntary home inspections to assist residents with identifying water conservation and efficiency opportunities.
- Preparation of a Municipal Water Conservation and Efficiency Plan to convey the findings of the previously referenced assessments, present resources to be made available to stakeholders, and document requirements of the plan, if any.

Recreation Sector

Opportunities for water savings in the recreational sector are primarily from golf courses. Changes in golf course irrigation practices, turf types, irrigated area, and adjacent landscaping afford opportunities for significant water savings. The physical and operational improvements to golf course irrigation systems may include modification of irrigation types and schedules, and the installation of soil moisture and evapotranspiration sensors (Mann 2014).

The following tasks will be implemented for the development of a Recreation Water Conservation and Efficiency Plan:

- Identify stakeholders/participants and conduct interviews to receive input and identify concerns to be addressed in the program development. Additionally, the interviews would be used to solicit suggestions for specific resources that will assist the recreational sector with improving efficiency.
- Assessment of each golf course's irrigation practices and irrigated acreage to identify areas where more efficient irrigation practices could be applied, and the potential cost/benefit of the action for the operator.
- Independent of specific property evaluations, a variety of irrigation practices, alternative turf types or management actions should be evaluated to recommend the best methods for increasing irrigation efficiency and groundwater conservation in the Subbasin.
- Preparation of a Recreational Water Conservation and Efficiency Plan to convey the findings of the previously referenced assessments, present resources to be made available to stakeholders, and document requirements of the plan, if any.

4.3.2 Water Conservation Program Relationship to Sustainability Criteria

The specific components of a water conservation program to be implemented within the Subbasin will be developed through a process of outreach, data compilation, and program design for each sector. By reducing the amount of water consumed within each sector, the program will reduce the water produced, thereby directly addressing the requirement to ramp down groundwater production to meet the sustainability goals. Chronic lowering of groundwater levels and reduction of groundwater in storage will be addressed by a reduction of pumping from the Subbasin. In addition, agriculture and landscape audits may result in a reduction in fertilizer and pesticide use needed for crops and turf, thereby limiting the amount of primarily nitrate and total dissolved solids (TDS) infiltrating to the aquifer.

Relationship to Measurable Objectives

The Water Conservation Program will incrementally reduce water demand in the Subbasin and is an option worth considering to achieve measurable objectives during Plan implementation and throughout the planning period. The Water Conservation Program is directly related to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as an incremental, direct physical action to maintain sustainability indicators, including groundwater levels and groundwater storage, above minimum thresholds to avoid undesirable results. The Water Conservation Program also has the potential to improve water quality by augmenting the quantity and quality of return flows.

4.3.3 Expected Benefits of the Water Conservation Program

In addition to the potential for incremental water savings estimated at 1,455 AFY for all sectors, the conservation program will raise awareness of the value of water as a resource and help modify the culture of water use. Therefore, the benefits of the program will accumulate as a larger segment of the local population becomes more educated about water conservation and modifies behavior over time. By taking a proactive role in water efficiency issues, the BWD and GSA will lead by example.

Agricultural audits are commonly performed by agencies throughout California. They are generally recognized as beneficial for increasing efficiency, reducing water use, and increasing crop yields. Audits are often conducted by Resource Conservation Districts with funding provided by counties or state grant programs. A previous study of the Subbasin completed by Roger Mann for DWR and BWD identified several individual actions and estimated costs for reducing water use (Mann 2014). This study estimated potential water savings of 365 AFY by maximizing agricultural irrigation efficiency. Potential water conservation savings for the municipal sector of 255 AFY assumes 20% water savings on BWD outdoor water use. An updated recreation sector water conservation estimate of 835 AFY was developed based on the assumptions made by Mann and interviews with several golf course landscape professionals with experience in Borrego Springs. Estimated water savings by sector as a result of implementing water conservation programs are listed in Table 4-2.

Table 4-2
Estimated Potential Water Savings by Sector for Water Conservation Programs

Water Sector/Crop	Potential Water Savings Acre-Feet Per Year
Agriculture	365[a]
Municipal	255[b]
Recreation	835[c]
Total	**1,455**

Source: Mann 2014.
Notes:
a Potential water savings for agriculture is based on an estimate of current irrigation efficiency of 79%, rising to 85% with implementation of irrigation system improvements. There may be potential for additional savings.
b Assumes 20% savings of outdoor water use that is about 75% of total BWD demand.
c Based on 2018 interviews and/or previous assumptions by Mann.

Recreation Sector

Potential water savings for golf courses are achievable by two primary activities: 1) converting turf to desert landscaping or low water use xeriscaping, and 2) optimizing golf course irrigation system management. Estimated potential water savings for golf courses by implementing turf conversion is provided in Tables 4-3.

Table 4-3
Estimated Potential Water Savings by Sector for Water Conservation Programs

Golf Course	Estimated Turf Acres[a]	Estimated Convertible Acres[b]	Potential Water Savings Acre-Feet Per Year
Borrego Springs Resort	106.00	32.0[c]	192.6
Club Circle	23.00	3.9	23.5
De Anza	146.76	24.9	149.9
Ram's Hill[d]	96.75	0.0	—
Road Runner Golf and Country Club	46.23	7.9	
The Springs	42.45	7.2	43.3
Total	**461.19**	**75.9**	**456.9**

Notes:
a Turf area based on aerial analysis of GIS.
b Assumes 17% of irrigated turf is convertible and 90 irrigated turf acres per 18-hole golf course, except where golf course specific information was provided. Water savings assume average water demand of 6.02 acre-feet per year per acre of turf.
c Borrego Springs Resort has indicated that up to 32 acres of turf is potentially convertible to desert landscaping based on their preliminary evaluation (Bambach, pers. comm. 2018).
d Rams Hill Golf Course has indicated that it is unlikely that they have any convertible turf. However, they have implemented irrigation system improvements and conversion of non-turf areas to native landscaping and are working with irrigation professionals to identify future water savings projects (Smith, pers. comm. 2018).

The average cost of turf conversion per acre for golf courses is $20,000. Conversion cost assumes turf removal and fine grading with sand or decomposed granite to match grade of adjacent turf.

No irrigation replacement or plant material is included. Conversion to desert landscaping from turf would be approximately $2.86 per square foot or $125,000 per acre (Smith, pers. comm. 2018).

Optimizing golf course irrigation system management is another management strategy that may result in water savings. This involves installation of new controllers and sprinkler heads, soil moisture sensors, and weather stations to improve irrigation efficiency. For instance some golf courses are required to turn on multiple sprinklers covering a large area even when only a small portion of the golf course requires irrigation. Estimated potential water savings for golf courses by optimizing golf course irrigation system management is provided in Table 4-4.

Table 4-4
Golf Course Irrigation System Management

Golf Course	Estimated Managed Acres of Irrigated Turf[a]	Potential Water Savings Acre-Feet Per Year at 0.82 AF/ acre/year[b]
Borrego Springs Resort	106.00	86.92
Club Circle	23.00	18.86
De Anza	146.76	120.34
Ram's Hill	96.75	79.34
Road Runner Golf and Country Club	46.23	37.91
The Springs	42.45	34.81
Total	**461.19**	**378.18**

Notes: AFY = acre-feet per year; AF = acre-feet.
[a] Turf area based on aerial analysis of geographic information system (GIS).
[b] Mann 2014.

The average cost of optimizing a golf course irrigation system is approximately $400 per acre per year (Mann 2014). For 100 acres of turf that works out to $40,000 per year; however, it should be noted that there are substantial upfront capital costs to install irrigation system infrastructure and train staff to use software and maintain equipment. Actual costs and potential water savings will vary, and require detailed evaluation and study of each golf course's existing irrigation system.

Municipal Sector

The Borrego Springs HOA implemented turf replacement projects in the last 5 years, which indicate the potential costs and benefits that may be achieved through additional turf replacement programs. Approximate data for historical turf replacement projects are presented in Table 4-5.

Table 4-5
Historical Turf Replacement Projects, Borrego Springs

Year	Area Replaced (square feet)	Total Cost	Cost/Square Foot	Estimated Outdoor HOA Water Savings (%)
Club Circle West, Borrego Springs HOA				
2013	38,800	$125,250	$3.23	37
2017	3,438	$8,695	$2.53	7
2018	2,770	$7,756	$2.80	7
2018	6,700	$15,000	$2.24	NA
Total	**51,708**	**$156,701**	**$3.03**[a]	**51**

Source: Duncan, pers. comm. 2018a, 2018b.
Notes: HOA = homeowner association; NA = not applicable.
[a] Average cost per square foot.

Based on the Borrego Springs HOA turf replacement projects, the average cost is approximately $3.00 per square foot or $131,000 per acre. Actual costs and water savings will be determined by specific program configuration and funding sources. Previous estimates indicate that HOA turf replacement and irrigation efficiency projects, if implemented throughout the Subbasin, have the potential to save approximately 90 AFY (Mann 2014).

Graywater Guidance Programs

In recent years, state regulations for the use of graywater have been relaxed, making it easier to utilize wastewater from showers, clothes washers, and wash basins for irrigation of certain types of landscaping (CWC, Chapter 15). “Laundry to Landscape” systems conforming to certain requirements do not currently require a state permit. The County Department of Environmental Health (DEH) administers graywater systems in unincorporated areas of the County. No construction permit is required for clothes washer systems provided the system is installed in accordance with the Graywater System Requirements for a Single Clothes Washer (County 2015). Larger graywater systems, which require more extensive plumbing modifications, require a permit. The County DEH has developed guidance for the design, installation, operation and maintenance of graywater systems to ensure subsurface irrigation systems discharging graywater will not contaminate surface water or groundwater or create public health hazards (County 2015b). The guidance also explains the permitting procedures and inspection of graywater systems. The DEH graywater systems webpage can be found at: https://www.sandiegocounty.gov/content/sdc/deh/lwqd/lu_graywater_systems.html

Installation of an individual graywater system in Borrego Springs is feasible provided a graywater system meets the requirements outlined in the guidance. There is an average of about 40 gallons per person per day available for graywater recycling and the average family can reduce their freshwater use by as much as 30% by using graywater for irrigation (SOW 2019).

4.3.4 Timetable for Implementation of Water Conservation Program

Because water conservation is a beneficial component of sustainable water supply planning, it is intended that the water conservation program will be enacted within the first few years of GSP implementation and continue indefinitely recognizing that all of the sectors have historically implemented or are in the process of evaluating water conservation and efficiency projects. It is anticipated that development of the program parameters will require approximately nine to twelve months to conduct stakeholder outreach, efficiency audits, draft document development, public comment, and finalization of the three Water Conservation and Efficiency Program components. Projects currently in planning development could potentially be implemented sooner if a viable funding source is identified.

4.3.5 Metrics for Evaluation of Water Conservation Program

The Water Conservation Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds is this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are potentially the most representative metrics to evaluate Program effectiveness. Additionally, the metrics available for evaluation of the Water Conservation Program are dependent on the water use sector and specific programs to be evaluated. Direct metrics will include groundwater levels and corresponding groundwater storage, and metered pumping records, effective after adoption of the GSP.

BWD water supply records will be used to directly evaluate water supply reduction for specific water accounts that have implemented water conservation program components. The number and types of water conservation projects implemented with quantification of water saved will also be documented. Indirect metrics may also include follow up evaluation of water users having received water audits to see which recommended measures were implemented and the associated estimated water savings. For water efficient fixture give-away or rebate programs, records of the number and type of fixtures will be used to approximate water savings. Similarly, follow up evaluation of turf replacement projects will allow for an approximation of water savings related to irrigation reduction. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Water Trading Program as shown in Table 4-6.

Table 4-6
Metrics for Evaluating Water Conservation Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 2	Water Conservation	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Number/type of projects implemented 5. Quantification of water saved	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost 5. Audits

Notes: PMA = Projects and Management Action.

4.3.6 Economic Factors and Funding Sources for Water Conservation Program

Planning-level development cost for establishing the Water Conservation Program is estimated to be approximately $130,000 and separate from development of this GSP.

Potential sources of funding for the Water Conservation Program components include state grants, transaction fees from trades, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.3.7 Water Conservation Program Uncertainty

Only high level estimates of the cost and benefits of the water conservation program are possible until there is a detailed plan for project components, stakeholder interest, and quantification of benefits for each sector. Some benefits such as stakeholder awareness and level of participation in voluntary programs are difficult to predict or quantify. Other components of uncertainty are the extent to which conservation measures have already been implemented and how to incentivize or require participation in specific components of the conservation programs.

4.4 PROJECTS AND MANAGEMENT ACTION NO. 3 – PUMPING REDUCTION PROGRAM

The Pumping Reduction Program is the central tool for the GSA to implement the GSP and achieve the sustainability goal for the Subbasin. The pumping reduction program is based on the establishment of each respective user's BPA. To implement the program, the GSA has been working with the groundwater extractors in the Subbasin to determine individual BPAs. Once the program is implemented, BPAs will be ramped down over time to bring pumping in the Subbasin within its sustainable yield by 2040. As described in SGMA, any limitation on extractions by the GSA "shall not be construed to be a final determination of rights to extract groundwater from the basin or any portion of the basin" (CWC, Section 10726.4(a)(2)).

The GSA has determined that adoption and implementation of the ramp down component of the pumping reduction program in the Subbasin described herein is likely to fall outside of the CEQA exemption set forth in SGMA (CWC, Section 10728.6). That provision states that: "Nothing in this part shall be interpreted as exempting from [CEQA] . . . a project that would implement actions taken pursuant to a plan adopted pursuant to this chapter." The GSA has decided to prepare CEQA environmental documentation in advance of considering the formal adoption and implementation of any ramp downs and a precise ramp down schedule for the Subbasin. The GSA anticipates consideration of an ordinance or other mechanism to adopt and implement a ramp down within 24 months of adoption of this GSP. An agreement among the Pumpers or GSA adoption of an interim ramp down schedule are two possible scenarios where pumping reductions could start prior to CEQA review completion.

4.4.1 Pumping Reduction Program Description

It is anticipated that the Pumping Reduction Program will consist of the following general components: (1) estimation of the Subbasin sustainable yield, (2) determination of BPAs for each non-*de-minimis* pumper, and (3) pumping allocation reduction recommendations over the implementation period to reach the estimated sustainable yield by 2040. In summary, each non-*de minimis* groundwater user within the Subbasin will be assigned an allocation based on their historical groundwater use. That allocation will be reduced incrementally as necessary until 2040 such that the total extraction from the Subbasin will be equal to the estimated sustainable yield at the end of that period. Non-*de minimis* groundwater users will be able to trade their pumping allowances in accordance with PMA No. 1, but the total volume of pumping allowances within the Subbasin will decrease over time. Each component of the program is discussed in greater detail as follows.

Estimation of the Subbasin Sustainable Yield

A water budget approach has been used to establish the estimated sustainable yield for the Subbasin as explained in Section 2.2.3, Water Budget, and Section 2.2.3.6, Sustainable Yield Estimate. Based on existing data, the estimated sustainable yield of the Subbasin is 5,700 AFY, which is an approximately 75% reduction from historical water use of up to 22,600 AFY as established by the BPA. The estimated sustainable yield is the target amount to which groundwater is to be reduced over the implementation period. As described in Section 3.5.4, Assessment and Improvement of Monitoring Network, data gaps may be filled and improvements to the Borrego Valley Hydrologic Model may occur as implementation of the GSP proceeds. It should be noted that the 5,700 AFY sustainable yield value is an estimate that depends on a number of climate and hydrological factors that will be re-evaluated concurrent with the GSP 5-year updates. If the sustainable yield changes as a result of significant new data, the pumping reduction schedule will be modified accordingly.

Determination of Baseline Pumping Allocation

BPAs have been determined for pumpers in each of the three sectors: recreational, municipal, and agricultural. The "baseline pumping allocation" is defined as the amount of groundwater each pumper in the Subbasin is allocated prior to SGMA-mandated reductions and is determined by the maximum annual production[1], in AFY, for each well owner over the baseline pumping period. The baseline pumping period is the 5-year period from January 1, 2010, to January 1, 2015. In addition to the three water use sectors, there are two small water use systems and two non-potable irrigators, the baseline allocations for which were considered separately. These are the Anza-Borrego Desert State Park (ABDSP) and the Borrego Air Ranch Water Co. The two non-potable irrigators are the Borrego Springs Unified School District (Elementary School) and La Casa Del Zorro Resort and Spa (La Casa Del Zorro).

The BPA is determined to be the maximum annual groundwater extraction during the baseline pumping period. Metered historical data is the most accurate method of determining maximum historical use. Therefore, metered data has been used when available. Metered data was available for the ABDSP, a limited number of private pumpers and for all of BWD's production. Where metered data was unavailable, including for golf courses and a large proportion of agriculture, water use is estimated using plant-specific evapotranspiration rates during the baseline period.

The evapotranspiration method requires the determination of irrigated areas and plant types and the application of a water use factor. Irrigated area and plant types have been determined from aerial photographs, limited field reconnaissance, GIS analysis tools and correspondence with pumpers. The water use factor is an annual estimate of water use in feet of water that includes plant type, climate, irrigation system efficiency, and for some crops such as citrus, the leaching of salts from the soils. The BPA methodology developed for the Subbasin is detailed in Appendix F, and the baseline pumping allocated by sector is provided in Chapter 2, Table 2.1-3.

Pumping Allocation Reduction

As described in Section 2.2.3.6, the estimated sustainable yield for the Subbasin is 5,700 AFY. This is approximately 25% of the historical extraction levels of about 22,600 AFY resulting in a required reduction in pumping of 75%.

Because many of the parameters used to determine water use and sustainable yield estimate are modeled or estimated, it is anticipated that adjustments will be required to achieve the sustainability goals. Therefore, the reduction of allocation will be reviewed at least every 5 years

[1] This is an estimate based on metered data from BWD, small water systems, and other pumpers, as well as estimated pumping based on the evapotranspiration method described in Appendix F.

in relation to groundwater levels, groundwater in storage and other sustainability criteria. Adjustments to the program will be made when necessary in the future by the GSA.

Pumping Overage Charges

The SGMA legislation allows for charging fees for pumping in excess of allocations or non-compliance with other GSA regulations (CWC Section 10732 (a)). The GSA will consider the adoption of fees and/or other penalties for violations of pumping allowance and/or reporting during the GSP implementation period.

4.4.2 Pumping Reduction Program Relationship to Sustainability Criteria

Permanent reduction in pumping directly relates to all of the applicable sustainability criteria. Pumping reductions will serve to stabilize declining groundwater levels and prevent loss of groundwater storage. Degradation of water quality may be limited as a result of a reduction in fertilizer use needed for crops and turf, thereby limiting the amount of primarily nitrate and TDS infiltrating to the aquifer.

Relationship to Measurable Objectives

The pumping reduction program will serve as a significant, direct physical action to meet the measurable objectives of chronic lowering of groundwater levels and the reduction in groundwater storage. Further, it is anticipated to support certain measurable objectives to protect against degradation of water quality.

Relationship to Minimum Thresholds

Consistent with the measurable objectives, the program serves as a significant, direct physical action to maintain sustainability indicators, including groundwater levels and groundwater storage, above minimum thresholds to avoid undesirable results. Additionally, improvements to water quality are expected as a result of reduction of fertilizer use and return flows to the aquifer.

4.4.3 Expected Benefits of the Pumping Reduction Program

As the central component to achieving sustainability within the Subbasin, the Pumping Reduction Program will result in the avoidance of undesirable results including chronic lowering of groundwater levels, reduction of groundwater in storage, and potentially degraded water quality. Peripheral benefits may include potential investment in alternate land uses or taking advantage of the water trading or land fallowing management programs. To achieve the required reductions, the sectors may implement conservation measures resulting in more efficient use of water and greater resiliency to long-term climate variability.

4.4.4 Timetable for Implementation of the Pumping Reduction Program

Individual allocations have been provided by the GSA to each existing user. Metering will be required with implementation of this GSP and are anticipated to be required within 90 days of GSP adoption. As the central component of the GSP, the Pumping Reduction Program is anticipated to be implemented once CEQA review of the GSP is completed. As such, it is expected that the Pumping Reduction Program will be implemented approximately 24 months after the adoption of this GSP. The program will be ongoing throughout the GSP implementation period as annual adjustments to the pumping allocations are made. It is anticipated that the ramp down schedule will be revisited during the 5-year GSP updates.

4.4.5 Metrics for Evaluation of Effectiveness of Pumping Reduction Program

The Pumping Reduction Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are probably the most representative metrics to evaluate effectiveness. Water metering will be required to implement this GSP, so that extractions from wells will be directly measured as specified in the Metering Plan (Appendix E2). Establishment of the BPA and pumping reduction or ramp down rates is required to be developed to implement the Pumping Reduction Program. The area of irrigated land and crop types should also be directly tracked to monitor program effectiveness. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Pumping Reduction Program as shown in Table 4-7.

Table 4-7
Metrics for Evaluating Pumping Reduction Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 3	Pumping Reduction Program	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Baseline pumping allocation (BPA) 5. Pumping reduction (ramp down) 6. Area of irrigated land and crop types 7. Used and unused BPA	1. Water budget components 2. Water quality 3. Subbasin demographics 4. Cost

Notes: PMA = Projects and Management Action.

4.4.6 Economic Factors and Funding Sources for Pumping Reduction Program

Planning-level development cost for establishing the Pumping Reduction Program is estimated to be approximately $82,000 and separate from development of this GSP.

Potential sources of funding for the Pumping Reduction Program components include pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

Concerns regarding this PMA specific to the SDAC community include water affordability (BWD rate impacts), loss of jobs/local economy, impacts to infrastructure, and/or quality of life. In response, the BWD commissioned an SDAC Impact/Vulnerability Assessment to understand the implications that the implementation of SGMA will have on the SDAC population of Borrego Springs. The report remarks that the 20-year SGMA compliance period does provide time for the community to adapt. The BWD's tiered rate structure (maintenance of low water rates for baseline water use) and seeking state funding to support the SDAC are strategies that consider the needs of the SDAC during GSP implementation.

BWD continues to actively work to assess water use and to evaluate how to best structure water costs for the SDAC. SGMA- and SDAC-related grants and other publicly funded support is expected to continue to be available and pursued by BWD to assist in subsidizing future water costs. Borrego Springs is a key part of the utilization experience for the ABDSP.

4.4.7 Pumping Reduction Program Uncertainty

Uncertainty associated with the Pumping Reduction Program is related to the method of establishing the estimated sustainable yield and baseline allocations. As described in Section 2.2.3, Water Budget, and previously in Section 4.4.1, it has been necessary to estimate historical groundwater use where direct measurement was unavailable. Therefore, evaluation and as-needed adjustment to the Program parameters will be conducted every 5 years, at a minimum.

Legal authority and Regulatory Process

SGMA provides the GSA with authority to: "control groundwater extractions by regulating, limiting, or suspending extractions from individual groundwater wells or extractions from groundwater wells in the aggregate, . . . or otherwise establishing groundwater extraction allocations" (CWC, Section 10726.4(a)). Also,

> in addition to any other authority granted to a groundwater sustainability agency by this part or other law, a groundwater sustainability agency may enter into written agreements and funding with a private party to assist in, or facilitate the implementation of, a groundwater sustainability plan or any elements of the plan (CWC, Section 10726.5).

Further, the powers outlined in SGMA are in addition to, and not a limitation on the authority granted to local agencies under any other law (CWC, Section 10725(a), 10726.8(a)). And, counties have independent authority under their police powers to act to protect groundwater and other related resources (Envt'l Law Foundation v. State Water Resources Control Board (Aug. 29, 2018), 3rd District Court of Appeal case no. C083239; Allegretti & Co. v. County of Imperial (2006) 138 Cal.App.4th 1261; Baldwin v. County of Tehama (1994) 31 Cal.App.4th 166).

In addition, under SGMA, "no extraction of groundwater between January 1, 2015, and the date of adoption of the plan pursuant to this part . . . may be used as evidence of, or to establish or defend against, any claim of prescription" (CWC, Section 10720.5(a)). The protection of the Subbasin and the achievement of the sustainability goals could be put at significant and unreasonable risk were the establishment of BPA's delayed until a later date. Failure to approve the BPA's at the time of GSP adoption could encourage pumpers to pump more groundwater in order to establish or defend against prescription. Accordingly, the GSA has determined that adopting the BPA's immediately, as part of the GSP, is the most protective of the Subbasin and in compliance with SGMA and other laws.

4.5 PROJECTS AND MANAGEMENT ACTION NO. 4 – VOLUNTARY FALLOWING OF AGRICULTURAL LAND

4.5.1 Program Description of Voluntary Fallowing of Agricultural Land

The voluntary Fallowing Program will constitute a mechanism to facilitate the conversion of high water use irrigated agriculture to low water use open space, public land, or other development on a voluntary basis. Due to the extent of the overdraft within the Subbasin and the infeasibility of increasing water production or tapping imported supplies, land fallowing is a necessary and principal management action to achieve sustainability. Although some fallowing programs in California are short term to address a specific drought or shortage, the program proposed for the Subbasin is primarily for long-term or permanent fallowing or conversion to other land uses. Approximately 2,480 acres of land in the Subbasin have been fallowed in the last several decades and another 600 acres were recently fallowed as part of the water credit program as described in Section 2.1.2, Water Resources Monitoring and Management Program.

Currently, there are about 2,624 acres of active agriculture within the Subbasin. It is anticipated that each of these lands/landowners with water demands during 2010–2014 will receive freely transferable BPAs as part of the GSP that, in turn, will encourage cultivated lands to be fallowed. Factors that will be considered for the fallowing program include the current extent of agriculture land and water use, the intended land and water use after fallowing, and the potential environmental impacts associated with fallowing. These include airborne emissions through windblown dust, the introduction or spreading of invasive plant species, and changes to the landscape that could adversely affect visual quality. The land uses proximal to the fallowing projects will affect the processes utilized and best management practices associated with fallowing proposals will be developed as part of this management action. For example, there could be differing levels of site stabilization or restoration needed or required based on the land use intended post-fallowing. Temporary stabilization will be less expensive and may be appropriate for properties to be developed for other use in the near term. A passive restoration approach may be applied if the goal is for the property to eventually return to native habitat, and active restoration may be applied for relatively near-term restoration to native habitat with the goal of providing open space, parks, or public trails.

The initial program phase will be to evaluate key issues associated with program development as follows:

- Evaluation and compliance with jurisdictional regulations already in place for vacant land
- Identification of existing prospective fallowing opportunities and anticipated environmental impacts and unintended consequences from unmanaged fallowed land
- Identification of land restoration goals
- Establishment of a uniform minimum standard to be met in fallowing agricultural lands in order to qualify for freely transferable BPAs
- Land management, inspection, and enforcement procedures
- Evaluation of future land use alternatives
- Evaluation of easements and appropriate easement language
- Development of a regulatory document
- Cost–benefit analyses
- Programmatic and/or project-based CEQA review

Legal Authority and Regulatory Process

Preparation of a CEQA evaluation for a fallowing program will identify potential environmental impacts and identify feasible alternatives or feasible mitigation measures. Establishment of a voluntary land fallowing program is expressly authorized under SGMA (CWC, Section 10726.2(c)). The fallowing program including program standards will be developed and undergo CEQA review as necessary.

4.5.2 Voluntary Fallowing of Agricultural Land Program Relationship to Sustainability Criteria

The Fallowing Program will address each of the undesirable results that have been identified for the Subbasin by reducing the amount of groundwater consumed from existing uses and reduced application of fertilizers or other agrichemicals. Reduced pumping will help to stabilize groundwater levels and increase groundwater in storage. Degradation of water quality may be limited to the extent that land fallowing or changes in land use reduces the amount of fertilizers applied for the former land uses.

Relationship to Measurable Objectives

The land fallowing program will serve as a significant, direct physical action to meet the measurable objectives of chronic lowering of groundwater levels and the reduction in groundwater storage. Further, it is anticipated to support certain measurable objectives for degradation of water quality, most notably for nitrate and TDS associated with agricultural return flows.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as a significant, direct physical action to maintain sustainability indicators, including groundwater levels, groundwater storage, and water quality above minimum thresholds to avoid undesirable results. Additionally, improvements to water quality are expected as a result of reduction of fertilizer use and return flows to the aquifer.

4.5.3 Expected Benefits from Voluntary Fallowing of Agricultural Land Program

In addition to the benefits derived directly from reduced pumping, the program will allow for a level of land use and community planning for converted properties not otherwise available. Depending on the nature of land uses implemented, the program could result in increased recreational space or potential economic benefits from conversion of land use types. For example, the conversion of previously fallowed land to a land restoration project that is expected to improve infiltration of stormwater runoff along the Coyote Creek wash is currently being evaluated.

4.5.4 Timetable for Implementation of Voluntary Fallowing of Agricultural Land Program

The initial phase of the program will be focused on program design, policy development, and stakeholder outreach. This phase can begin immediately and is anticipated to take from 4 to 6 months. Full implementation of the program is anticipated following CEQA review, if needed.

Once implemented, the program will result in immediate groundwater savings, which may increase with addition of fallowed lands and fluctuate depending on the nature and timing of converted land use.

4.5.5 Metrics for Evaluation of Voluntary Fallowing of Agricultural Land Program

The Voluntary Fallowing of Agricultural Land Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater levels and corresponding changes in Subbasin groundwater storage are the ultimate metrics to evaluate effectiveness. Direct metrics by which to evaluate the success of the fallowing program include comparison of pre- and post-pumping records for fallowed or converted properties, to the extent available. The area of irrigated land and crop types should also be directly tracked to monitor program effectiveness. Additionally, the number of fallowing projects implemented, active and or planned are to be tracked. Water budget components, when combined with water quality, demographic information, and project costs may be used as an indirect measure of the effectiveness of the Voluntary Fallowing of Agricultural Land Program as shown in Table 4-8.

Table 4-8
Metrics for Evaluating Voluntary Fallowing of Agricultural Land Program Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 4	Voluntary Fallowing of Agricultural Land	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Area of irrigated land and crop type 5. Area of fallowed land 6. Number of implemented/active/planned projects	1. Water budget components 2. Water quality 3. Subbasin demographics 4. End-use of fallowed land 5. Stabilization of site soils 6. Cost

Notes: PMA = Projects and Management Action.

4.5.6 Economic Factors and Funding Sources for Voluntary Fallowing of Agricultural Land Program

Planning-level development cost for establishing the Voluntary Fallowing of Agriculture Program is estimated to be approximately $103,000 and separate from development of this GSP.

Potential sources of funding for the Voluntary Fallowing of Agriculture Program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

Ongoing program costs will be determined through the initial task of developing a fallowing plan, including a development of a uniform minimum standard for fallowing. These potential costs are related to the conformance inspections, economic value of fallowed land, the cost for site stabilization, and restoration. Additionally, wells that will no longer be used will have costs to be properly destroyed. Preliminary estimation for site stabilization and restoration is as follows:

- Level 1: Site Stabilization: Sites planned to be left fallow which could be used for future development would benefit from site stabilization. This approach to fallowing orchards should include stabilizing the land surface, avoiding the blight of dead tree stands, reducing weed growth, and reducing dust emissions.
    - Cutting and chipping orchard trees and spreading over the surface. **Cost estimate: $1,000–$5,000 per acre**
- Level 2: Passive Restoration: If the ultimate goal of the site is to convert to natural habitat which can allow for a relatively long period of time to establish future open space (e.g., Anza-Borrego Desert State Park (ABDSP) land), a passive restoration approach could be implemented in some areas of the Subbasin such as those influenced by the floodwaters of Coyote Creek wash. This approach would establish the fundamental site conditions that would put the site on a trajectory towards reestablishment of native habitat. This approach could include tree removal, site contouring, soil decompaction, and native seed collection and application. It does not include maintenance and monitoring. A passive restoration approach can take many years, and even decades, in a desert environment. **Cost estimate: $10,000–$25,000 per acre**
- Level 3: Active Restoration: An active restoration approach would be appropriate if the goal of the site is to restore site to natural habitat in a relatively short period for future open space (e.g., ABDSP land, open space trails). This approach would require full restoration of the site including site preparation as described for passive restoration, plus horizontal/vertical mulch, supplemental seeding, maintenance, monitoring, and remedial actions and goals. While active restoration is more labor intensive and expensive than passive restoration, it could take as little as 3–5 years to establish and meet success criteria. **Cost estimate: $25,000–$50,000 per acre**

The cost per acre-foot saved will depend on the historical land use and the method of fallowing or conversion.

Preliminary Estimation for Costs to Properly Destroy Wells

Well Destruction Permit: For each fallowing transaction, the GSA may request the property owner to obtain a Well Destruction Permit from the County of San Diego Department of Environmental Health (DEH) for any wells that will no longer be used after the land is fallowed. Alternatively, the GSA may consider utilizing wells for groundwater monitoring. As of July 1, 2018, the fee for a Well Destruction Permit for a single water well is $334. DEH updates the fees on an annual basis and should be contacted to determine the current fee required to be collected for the permit. The Well Destruction Permit must be obtained by a California C57 Licensed Contractor who is listed on the DEH approved Well Driller's List. The DEH water wells webpage can be found at: https://www.sandiegocounty.gov/content/sdc/deh/lwqd/lu_water_wells.html

Costs to Properly Destroy Wells

An Engineers Estimate was obtained to properly abandon a 16-inch diameter, 500 feet deep well in 2018 dollars. It is $33,500 assuming the well needs to be pressure grouted with cement, and prevailing wage applies. For each additional foot of well depth an additional $41 should be added to the cost. Costs for narrower diameter wells would be less expensive.

The Engineers Estimate to pull a turbine pump installed to a depth up to 500 feet is $6,800 assuming prevailing wage applies.

Thus, the Engineers Estimate to properly destroy wells is $40,300 per well assuming prevailing wage applies. Non-prevailing wage well destructions could be initiated by private landowners.

4.5.7 Voluntary Fallowing of Agricultural Land Program Uncertainty

Program uncertainty is related to the willingness of property owners to participate in the program and the water consumption of future, post fallowing, post transfer land uses. These parameters will be evaluated during the first phase of the implementation.

4.6 PROJECTS AND MANAGEMENT ACTION NO. 5 – WATER QUALITY OPTIMIZATION

Groundwater is extracted for multiple beneficial uses in the Subbasin including municipal and domestic use, and for irrigation. At a minimum, for municipal and domestic wells, the water quality must meet potable drinking water standards specified in Title 22 of the CCR. For irrigation wells, water quality should generally be suitable for agriculture and recreational use. Water quality optimization is primarily focused on ensuring potable water quality for municipal and domestic use. Additionally, water quality optimization will evaluate the potential to match water quality for intended uses such as the potential to use groundwater with elevated nitrate concentrations or other constituents of concern for irrigation. In general, the groundwater quality in the Subbasin is good and meets California drinking water maximum contaminant levels without the need for treatment.

As documented in Section 2.2.2.4, Groundwater Quality, naturally occurring poor water quality has been identified in specific areas: near the margins of the Subbasin where unconsolidated sediments are in contact with fractured bedrock; for select wells screened predominantly in the lower aquifer of the South Management Area that have concentrations of arsenic above the drinking water maximum contaminant level; and near the Borrego Sink where elevated sulfate and TDS are likely associated with dissolution of evaporites from the dry lake. Historical groundwater quality impairment for nitrates is noted for select portions of the Subbasin predominantly in the upper aquifer of the North Management Area underling the agricultural areas and near high density of septic point sources. The source of nitrates is likely associated with either fertilizer applications or septic return flows. It should be noted that BWD does not have wells in the Borrego Sink area, and utilizes wells that produce water meeting Title 22 requirements without further treatment.

A robust groundwater quality monitoring program is essential to the implementation of the "Water Quality Optimization Program." Analysis of the existing monitoring program and data gaps has revealed lateral, vertical, and temporal limitations to water quality data availability. These data gaps will be addressed with collection and analysis of additional data and implementation of this GSP as described in Section 3.5, Monitoring Network.

4.6.1 Water Quality Optimization Program Description

Implementation of the Water Quality Optimization Program is to be initially conducted at the planning level. However, preliminary evaluations have already been conducted for several water quality optimization options. These are presented briefly following the section on planning considerations as follows.

Water Quality Optimization Planning

Development of the Groundwater Quality Optimization Program is anticipated to include three general phases: (1) investigation to identify the sources, nature, and extent of existing and potential future water quality impairments; (2) as needed, development of work plans to implement mitigation strategies; and (3) implementation of water quality mitigation projects.

The initial program phase will be to evaluate key issues associated with program development as follows:

- Evaluate existing data for gaps related to identification of contaminant sources (e.g., well construction information in areas with suspected surficial contaminant sources).
- Perform outreach with applicable stakeholders to obtain input regarding pertinent practices or anticipated future activities and vulnerabilities (e.g., meeting with farmers regarding fertilizer application practices).
- Scope investigations to fill data gaps or refine preliminary findings.
- Evaluate proactive abandonment of inactive wells to minimize migration pathways.

- As needed, prepare recommended mitigation alternatives for GSA consideration, with associated cost-benefit analyses.
- Identify potential funding sources.
- Consider costs and benefits for combined treatment projects and methods.
- As needed, scope a feasibility study for outlining the procedures for characterizing and mitigating degraded groundwater quality in the Subbasin.
- Prepare a Groundwater Quality Optimization Plan.

BWD Water Quality Optimization Options

Both direct treatment and indirect options have been considered to optimize groundwater quality and its use. Direct treatment of some types of groundwater contaminants may not be cost effective. There are indirect methods that may be more cost effective such as blending of poor quality water with better quality water, the construction of new wells in areas or aquifers with better quality water, transfer of water to areas where water use is better suited to a particular water quality as described in Section 4.7, PMA No. 6 – Intra-Subbasin Water Transfers, and reallocation of pumping production between wells.

Direct Treatment Options

The BWD has investigated the treatment of arsenic and nitrates on a preliminary basis. Treatment and cost considerations are presented *in Water Replacement and Treatment Cost Analysis for the Borrego Valley Groundwater Basin* (Dudek 2015). The feasibility of treatment is dependent on several factors including the contaminant concentration, quantity of water to be treated, the type of treatment facilities, and the operation and maintenance cost associated with particular treatment methods. Wellhead treatment systems yielded a wide range of total costs based on the level of uncertainty. The costs have been estimated to be between $227 and $548 per acre-foot for municipal production wells (Dudek 2015). Treatment system costs have not been evaluated for domestic wells because there have been no known detections of arsenic above drinking water standards reported for domestic wells. If private wells were to become impacted by water quality degradation, the feasibility of direct treatment would be evaluated.

Indirect Treatment Methods

Indirect treatment methods considered include various blending scenarios, the construction of new wells and delivery facilities, and re-allocation of pumping among existing wells.

Blending

Arsenic levels above the maximum contaminant level have historically been documented in one active BWD well and several private irrigation wells in the South Management Area; however, all BWD wells currently meet drinking water standards. There is a potential that continued decline in groundwater levels may result in increased arsenic concentrations. If increased arsenic concentrations do occur in BWD wells in the future, blending of water from these wells with BWD wells that do not have elevated arsenic is potentially a low-cost alternative to direct treatment. The cost associated with blending is highly variable and will depend on proximity of wells and the water quality of the blending source well. Additionally, the Division of Drinking Water would need to review and approve any potential blending plan, and it may not be possible to meet Division of Drinking Water standards because blending is not a preferred permanent alternative due to the potential for variability in the concentration of arsenic at the well-head over time.

New Well and Pipeline

This option would require the construction of new extraction wells in a part of the basin with acceptable water quality (potentially the North Management Area or Central Management Area). In addition to well construction costs associated with this alternative, costs to be evaluated include the cost of distribution pipelines, ongoing maintenance costs, and project power. The BWD is currently locating, designing and constructing up to three new potable extraction wells as part of its current Capital Improvement Plan.

Reallocation of Pumping from Existing Wells

Another option in the future is to re-allocate production from wells with higher levels of constituents of concern and potential for future water quality degradation, with production from more reliable wells with better water quality. The feasibility of this mitigation measure would be based on availability of water resources from wells in other parts of the Subbasin. If private wells were to become impacted by water quality degradation, the feasibility of drilling new wells or connecting to the BWD distribution system would be evaluated.

4.6.2 Water Quality Optimization Relationship to Sustainability Criteria

The Water Quality Optimization Program will address the undesirable result of water quality degradation. Avoiding undesirable results to water quality benefits the whole Subbasin to the benefit of all pumpers. Depending on the methods selected to optimize water quality, the Water Quality Optimization Program could potentially help to alleviate declining groundwater levels in particular areas of the basin by relocating pumping to other parts or management areas.

Relationship to Measurable Objectives

The Water Quality Optimization Program will be implemented to meet the measurable objectives for water quality.

Relationship to Minimum Thresholds

Consistent with the measurable objectives, the program serves as a direct physical action to maintain water quality above minimum thresholds to avoid undesirable results.

4.6.3 Expected Benefits of Water Quality Optimization

The primary benefit of the Water Quality Optimization Program is the existing and future maintenance of high quality water produced by groundwater extractors. Associated benefits may include lower long-term water costs to customers and reduction of future degradation of water quality.

4.6.4 Timetable for Implementation of the Water Quality Optimization

It is anticipated that the Water Quality Optimization Program will require a significant analysis and planning component prior to the implementation of specific water quality projects. Such planning has already started and the entire planning component is expected to take from 18 to 24 months after adoption of the GSP. The need for specific water quality optimization projects will be evaluated annually based on the results of the monitoring network described in Section 3.5, Monitoring Network.

4.6.5 Metrics for Evaluation of Water Quality Optimization

Water Quality Optimization will include both direct and indirect metrics to evaluate the effectiveness of the program. Effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds in this Plan. As such, groundwater quality in the Subbasin is the ultimate metric to evaluate effectiveness. Water quality evaluation has been included in the data gaps analysis and groundwater monitoring plan as described in Section 3.5, Monitoring Network. Specific metrics will include monitoring for the constituents most likely to be of concern in the basin, including arsenic, nitrate, sulfate, fluoride, and TDS. Metered groundwater extraction, groundwater levels and corresponding changes in groundwater storage will be monitored as they potentially relate to the potential for leaching of contaminants from subsurface geology. Active and implemented optimization projects will be tracked, and the need for new projects will be identified. Water budget components, when combined with demographic information and project costs may be used as an indirect measure of the effectiveness of the Water Quality Optimization as shown in Table 4-9.

Table 4-9
Metrics for Evaluating Water Quality Optimization Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 5	Water Quality Optimization	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater extraction 4. Water quality 5. Active projects/identification of need for projects 6. List of implemented projects	1. Water budget components 2. Subbasin demographics 3. Cost

Notes: PMA = Projects and Management Action.

4.6.6 Economic Factors and Funding Sources for Water Quality Optimization Program

Planning-level development cost for establishing the Water Quality Optimization Program is estimated to be approximately $124,000 and separate from development of this GSP.

Potential sources of funding for the Water Quality Optimization program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.6.7 Water Quality Optimization Program Uncertainty

Program uncertainty includes unknown existing and future water quality, and the costs and efficacy associated with projects selected to address water quality degradation. These costs are dependent on a more thorough characterization of the severity and location of existing and potential future water quality impairments. Additionally, there is uncertainty regarding the availability of funding to implement the Water Quality Optimization Program.

4.7 PROJECTS AND MANAGEMENT ACTION NO. 6 – INTRA-SUBBASIN WATER TRANSFERS

4.7.1 Intra-Subbasin Water Transfers Program Description

The purpose of Intra-Subbasin Transfer Program is to mitigate existing and future reductions in groundwater storage and groundwater quality impairment by establishing conveyance of water from higher to lower production alternative areas in the Subbasin. This PMA will evaluate the feasibility and effectiveness of utilizing new or existing well sites in the Subbasin where groundwater conditions are more favorable for continued groundwater extraction. Currently, the BWD is the only entity in the Subbasin with a large water distribution system. The BWD distribution system supplies only potable water. All other water users in the Subbasin only have small, private conveyance restricted to limited areas of land. These include both potable and non-potable systems for domestic and irrigation use.

The GSA has designated three Subbasin management areas as described in Section 2.2.4, Management Areas. The management areas are based primarily for the purpose of groundwater quality management since the end uses of groundwater differs substantially across the three management areas. Wells in the North Management Area (NMA) serve primarily agricultural use whereas wells in the Central Management Area (CMA) primarily serve municipal and recreational uses, and wells in the South Management Area (SMA) primarily serve recreational use which means there may be different thresholds for undesirable results for potable versus non-potable uses. For example, groundwater pumped in the NMA, with potentially elevated nitrate levels from irrigation return flow, might be beneficially used to irrigate golf course turf in the CMA or SMA. Conveyance of non-potable water in the Subbasin would require construction of a new non-potable distribution system. A non-potable distribution system could benefit all pumpers in the Subbasin because it would preserve areas of the Subbasin where water meets drinking water standards. Additionally, because the Desert Lodge anticline effectively compartmentalizes the SMA from the CMA, it may be necessary to convey water between management areas to achieve location specific measurable objectives for groundwater levels and groundwater in storage. The need for transfer of pumped groundwater may be of benefit to other areas of the Subbasin depending on the timing and location of pumping reductions. For instance, if a sizable area of land were fallowed in the NMA, there is the potential to use existing wells to supply water to the CMA or SMA.

As part of this PMA, current system infrastructure, condition, and needs as well as identify potential siting for new wells and conveyance facilities will be evaluated.

Development of the Intra-Subbasin transfer program will include the following steps:

- Inventory of existing infrastructure with considerations for capacity, condition, and vulnerabilities.
- Identification and prioritization of specific extraction wells that warrant mitigation/replacement.
- Preliminary opportunities and constraints analysis.
- Identification of current and potential future water blending opportunities and limitations.
- Estimated costs for anticipated future water treatment requirements (i.e., arsenic, nitrate, TDS) for the existing well network.
- Cost-benefit analysis for various selected project alternatives.
- Development of a more specific Intra-Subbasin Water Transfer Plan.

Legal Authority and Regulatory Process

A GSA has the power to "perform any act necessary or proper to carry out the purposes of [SGMA]" (CWC Section 10725.2(a)). A GSA may also "authorize temporary and permanent transfers of groundwater extraction allocations within the agency's boundaries, if the total quantity of groundwater extracted in any water year is consistent with the provisions of the groundwater sustainability plan." A GSA also has the power to "(e) Transport, reclaim, purify, desalinate, treat, or otherwise manage and control polluted water, wastewater, or other waters for subsequent use in a manner that is necessary or proper to carry out the purposes of this part" (CWC, Section 10726.2(e)).

4.7.2 Intra-Subbasin Water Transfers Program Relationship to Sustainability Criteria

The Intra-Subbasin Transfer Program will potentially address multiple undesirable results identified for the Subbasin. Groundwater level declines may be addressed by the transfer of water from parts of the Subbasin with stable groundwater levels to those with pumping depressions or groundwater level declines. Water transfers may also allow for selective pumping of the middle or lower aquifers as opposed to the upper aquifer, which is likely more susceptible to water quality impacts as a result of septic and irrigation return flows. Use of groundwater resources may be optimized by the transport of water for uses to which the water quality is compatible, thereby potentially preserving good water quality for potable use. For example, transfer of high nitrate groundwater for irrigation may reduce the reliance on potable water.

Relationship to Measurable Objectives

The Intra-Subbasin Transfer Program is intended to optimize water supply and demand for beneficial users in the Subbasin. This program will evaluate the distribution of pumping in the Subbasin that could result in direct effects to the chronic lowering of groundwater levels and reduction of groundwater in storage measurable objectives.

Relationship to Minimum Thresholds

Consistent with the measurable objective, the program serves as a direct physical action to manage groundwater levels, groundwater in storage and water quality above minimum thresholds to avoid undesirable results.

4.7.3 Expected benefits of the Intra-Subbasin Water Transfers Program

The primary benefit of the Intra-Subbasin Transfer Program is that it will provide flexibility in regard to where groundwater is produced and consumed. In particular, it provides a potential mechanism to convey both potable and non-potable water to end users. This would allow for conveyance of groundwater of specific water quality for purposes to which its use is compatible. Additionally, it could provide an additional tool to reduce groundwater extraction from areas of declining groundwater levels. It is expected that Intra-Subbasin Transfer Program would help achieve measurable objectives for groundwater levels, groundwater in storage and water quality.

4.7.4 Timetable for Implementation of the Intra-Subbasin Water Transfers Program

It is anticipated that the planning part of the Intra-Subbasin Transfer and analysis plan will require approximately 9–12 months but potentially be required to be initiated during GSP implementation based on the results of the monitoring network as described in Section 3.5, Monitoring Network.

4.7.5 Metrics for Evaluation of the Intra-Subbasin Water Transfers Program

The Intra-Subbasin Water Transfer Program will include both direct and indirect metrics to evaluate the effectiveness of the program. Program effectiveness is primarily related to Subbasin sustainability goals that are quantified through the development of measurable objectives and minimum thresholds. As such, groundwater levels, corresponding changes in Subbasin groundwater storage, and water quality are probably the most representative metrics to evaluate effectiveness. Direct metrics by which to evaluate the success of the metrics for the evaluation of the Intra-Subbasin Transfer Program include area and aquifer-specific measurement of groundwater levels and corresponding changes in groundwater storage, metering of groundwater production and monitoring water quality. Active and implemented projects will be tracked, and the need for new projects will be identified. Water budget components, when combined with demographic information and project costs, may be used as an indirect measure of the effectiveness of the Intra-Subbasin Water Transfers as shown in Table 4-10.

Table 4-10
Metrics for Evaluating Intra-Subbasin Water Transfers Effectiveness

PMA No.	PMA Name	Direct Metrics	Indirect Metrics
No. 6	Intra-Subbasin Water Transfers	1. Groundwater levels 2. Groundwater storage 3. Metered groundwater production 4. Water quality 5. Active projects/identification of need for projects 6. List of implemented projects	1. Water budget components 2. Subbasin demographics

Notes: PMA = Projects and Management Action.

4.7.6 Economic Factors and Funding Sources for Intra-Subbasin Water Transfers Program

Planning-level development cost for establishing the Intra-Subbasin Water Transfers Program is estimated to be approximately $90,000 and separate from development of this GSP.

Potential sources of funding for the Intra-Subbasin Water Transfers Program components include state grants, pumping fees, water rates, parcel taxes, and other mechanisms as described in Section 5.1.6.

4.7.7 Intra-Subbasin Water Transfers Program Uncertainty

Program uncertainty associated with intra-subbasin water transfers includes the cost and availability of land for infrastructure and facilities construction, level of participation of water users, and water quality suitability for contributing and receiving uses, some of which activities may require CEQA compliance. Intra-subbasin water transfers may require construction of new pipeline conveyance systems, siting and construction of new extraction wells, and additional analysis of water quality.

4.8 GROUNDWATER SUSTAINABILITY PLAN COORDINATION WITH GENERAL PLAN UPDATE

SGMA (CWC, Sections 10727.2(g), 10726.9) requires coordination of GSPs with General Plan Updates in order to promote consistency within the planning documents. In this case, the County is a member of the GSA and, thus, this task of coordination is more streamlined than it may be with the development of other GSPs.

The sustainability goals of the GSP are anticipated to play a central role in the County's next General Plan update process, which encompasses updates to the Borrego Springs Community Plan (see Chapter 2, Basin Setting). The GSA has prepared a *Planning, Permitting and Ordinance Review Technical Report* that identifies key issues of current County plans and policies that may need to be changed or updated to ensure consistency with the long-term sustainability goal and sustainable management criteria of the GSP.

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