

Basin Framework for a Multi-benefit Groundwater Replenishment and Trading Program (Outline for GSP Chapters)

CHAPTER [XX]: Multi-benefit Groundwater Replenishment

- I. Introduction
 - a. Achieving groundwater sustainability in many critically overdrafted basins is contingent upon collaboration between landowners/pumpers/operators (“operators”) and GSAs to replenish groundwater.
 - b. This chapter sets forth mechanisms to encourage and incentivize operator engagement in groundwater replenishment projects, with opportunities to pair these efforts with community and natural resource values, such as habitat creation and improved drinking water quality.
- II. Groundwater Replenishment Actions
 - a. Importance and contribution to GSP measurable objectives
 - i. The GSA has documented a need for groundwater replenishment projects in order to ensure the basin is operated within its sustainable yield and has determined to leverage operators’ capacity to meet that objective.
 - b. The GSA will encourage and cooperate with operators to implement direct replenishment methods, including the following:
 - i. Recharge basins
 - ii. Flooding agricultural lands
 - iii. Instream and canal replenishment
 - iv. Aquifer injection
 - c. The GSA will encourage and cooperate with operators to implement indirect replenishment methods, which result in a reduction in groundwater pumping in the basin, including the following:
 - i. In-lieu recharge
 - ii. Temporary fallowing, such as removing permanent plantings or landscaping and delaying replanting for a defined time or rotational fallowing of annual crops
 - iii. Reducing consumptive use by conversion to less water intensive plantings
 - iv. Permanent land retirement
 - d. The GSA will encourage and cooperate with operators to obtain and deliver water supplies for direct replenishment and in-lieu recharge, including the following:
 - i. Imported surface water
 - ii. Flood flows, reservoir flood control releases, stormwater capture
 - iii. Recycled water
 - iv. Desalination
 - v. Groundwater allocation transfers
 - e. The GSA will cooperate with the operator to avoid or mitigate third party impacts associated with replenishment projects.
 - f. The GSA will cooperate with operators to adhere to applicable regulatory processes (federal, state, and local) and state water rights laws.
 - g. The GSA will coordinate with DWR, SWRCB, and operators to access any available financial assistance for water replenishment projects and management actions.

III. Crediting and Accounting for Operator Replenishment

- a. To incentivize operator participation in groundwater replenishment, the GSA will develop appropriate crediting and compensation mechanisms that:
 - i. Allow operators to document through a written agreement with the GSA the terms and conditions of the replenishment program, including the amount of water to be credited or other form of compensation to the operator.
 - ii. Provide a documented right for the operator to utilize or market a defined portion of the developed water; and
 - iii. Establish a basin-wide accounting framework for each operator's developed groundwater supply. If the GSA has established extraction limits, the framework shall account for the operator's groundwater allocation as well as credits to the operator's accounts for developed water.
- b. The GSA will credit replenishment subject to the following conditions and limitations:
 - i. Replenishment projects returning more than X AF per year must be permitted by the GSA. The operator's permit application will include the following:
 1. Method of replenishment
 2. Estimated volume of water
 3. Beneficial use of the recharged water and conditions for extraction
 4. Measurement and reporting requirements for recharge
 - ii. Replenishment will be credited less a "leave-behind" for the benefit of the basin and/or related community and natural resource values.
 - iii. Extraction rates may need to be limited to avoid third party impacts, with consideration for hydrologic and other conditions.
 - iv. The GSA may credit recharge projects that occurred prior to the initiation of the GSP.
- c. The operator may draw upon the credits as follows:
 - i. For application to land overlying the basin, subject to any applicable limitation of state law or local ordinance.
 - ii. For sale, transfer or exchange for use within the basin boundaries and subject to the market established pursuant to Chapter [YY] below.

IV. Community and Natural Resource Values

- a. The GSA will assist operators in implementing groundwater replenishment projects in a manner that promotes local community and natural resource benefits.
- b. Management of direct replenishment projects
 - i. The GSA will work with operators to develop appropriate baseline management conditions for direct replenishment methods, such as recharge ponds and on-farm recharge, to control sediment buildup, rodents, mosquitos, and other undesirable outcomes.
 - ii. The GSA will provide an additional menu of options of natural resource management strategies that may be implemented in conjunction with replenishment projects that provide multiple benefits, available in Appendix D, in order to achieve defined and measurable conservation and/or community resource values. These may include improved water quality or supply reliability

for local community water systems, providing wetland habitat for migratory birds, and diverting stormwater to aid in flood management.

- c. Management of fallowed or retired lands
 - i. The GSA will work with participating operators to develop appropriate baseline management conditions for fallowed land to avoid undesirable outcomes for the community, such as invasive plant infestations or dust emissions, or to provide public benefits on these fallowed lands, such as improved habitat.
 - ii. The GSA will provide an additional menu of options of natural resource management strategies that may be implemented in conjunction with replenishment projects that provide multiple benefits, available in Appendix D, such as the creation of saltbush scrubland habitat for listed species and pollinator habitat.
- d. Voluntary agreements and assurances for management of fallowed or retired lands
 - i. Voluntary commitments to provide natural resource and/or community values may be reflected in appropriate agreements or easements depending upon the nature and duration of the commitment.
 - 1. The GSA commits to working with appropriate resource management agencies to provide operators assurances that future activities will not be inhibited by providing for such conservation and/or community resource values.
 - ii. Where possible, the GSA will aid in the development of programmatic voluntary conservation agreements (e.g., Safe Harbor Agreements). Operators will be able to choose to enter into such land management agreements in exchange for assurances that further land management requirements and associated costs will not be imposed on the operator.
- e. Other Land Use Issues
 - i. As groundwater replenishment efforts often require changes in land use management, these actions may require local, state, and federal natural resource management agency approvals. The GSA will assist operators interested in replenishment projects with co-benefits in coordinating with the appropriate agencies. Appendix E (in development) outlines agencies that may be relevant to implementation of such replenishment projects.
- f. Incentives
 - i. Where possible, state, federal, and private financial incentives can be used to support the creation of habitat and community benefits. Appendix B (in development) provides information on funding programs that can help support actions that benefit community and natural resources.

CHAPTER [YY]: Water Trading

- I. Introduction: This chapter provides a framework for implementation of groundwater trading programs as a groundwater management mechanism.
- II. Groundwater Trading Program
 - a. Importance and contribution to GSP measurable objectives
 - i. The GSA has determined that a trading program for groundwater shares and/or allocations will serve as an appropriate mechanism for efficiently distributing scarce groundwater among operators and minimizing economic dislocation.
 - b. The GSA will develop and administer a robust groundwater trading system covering the following:
 - i. Water available pursuant to credits acquired by participating in activities authorized by Chapter [XX] above, including those accrued pre-GSP adoption.
 - ii. Groundwater that may be available when the GSA places a cap upon pumping equal to the sustainable yield and apportions pumping shares and/or allocations among existing operators.
 - c. When developing and administering the groundwater trading system, the GSA will take into consideration the following elements to accommodate local basin conditions:
 - i. The status of local groundwater rights
 - ii. How to evaluate trading impacts in order to minimize adverse impacts on third parties
 - d. The GSA will establish and enforce trading rules, including the following:
 - i. No transfer of credits or pumping allocations (either on a temporary or permanent basis) shall occur without the approval of the GSA.
 - ii. The GSA will facilitate the trading of water shares and allocations, on short-term and permanent bases.
 - iii. The GSA will determine carryover rates for unused credits and allocations (i.e., a landowner trading current use for future use) that cause no impact to third parties.
 - iv. If management zones are established, trading will occur subject to ratios that correspond to each zone. The GSA will revise these as necessary as basin conditions vary. Trading ratios may depend upon whether trading occurs within zones of confined or unconfined aquifers or between zones, or upon protections in place for community and natural resource values.
 - v. Approval of transfers will be conditioned on the trading parties publicly reporting the following information:
 1. Share, or volumetric allocation among, being transferred
 2. The price pursuant to which the share or allocation is being transferred
 3. The location of the property that is the source of the share or allocation being transferred
 4. The name of the operator and location of the property that shall receive the share or allocation being transferred

5. The depth to groundwater in the location of the property that is the source and destination of the share or allocation
 6. Groundwater quality in the location of the property that is the source and destination of the share or allocation
 7. The duration of the transfer
 8. Identification of any community water systems proximate to the property that is the origin and destination of the share or allocation
 9. Identification of any natural resources proximate to the property that is the source and destination of the share or allocation
- e. The GSA will ensure the trading parties are in compliance with the California water rights system, environmental reviews, and other regulations as applicable.
 - f. The GSA will establish monitoring protocols to evaluate how groundwater trading has impacted the basin's sustainability indicators.
 - g. Oversight and enforcement
 - i. The GSA will ensure operators are not over-extracting beyond their allocations, and will ensure that trading rules are followed.
 - ii. Penalties for non-compliance will be imposed by the GSA.
 - iii. The GSA will provide corrective measures for non-compliant operators.
 - h. Adaptive management
 - i. The GSA will periodically assess the effectiveness of the trading program in meeting sustainability goals.
 - ii. The GSA will consider updating the trading program structure, process, and/or rules on an annual basis, or as significant information regarding basin sustainability indicators is made newly available.
 - i. The GSA will ensure that all information regarding trading applications and completed trades is made public, and that operators are engaged in decision-making processes of the groundwater trading program.
 - j. The GSA may provide an online trading platform that connects willing buyers and sellers of groundwater shares and allocations.