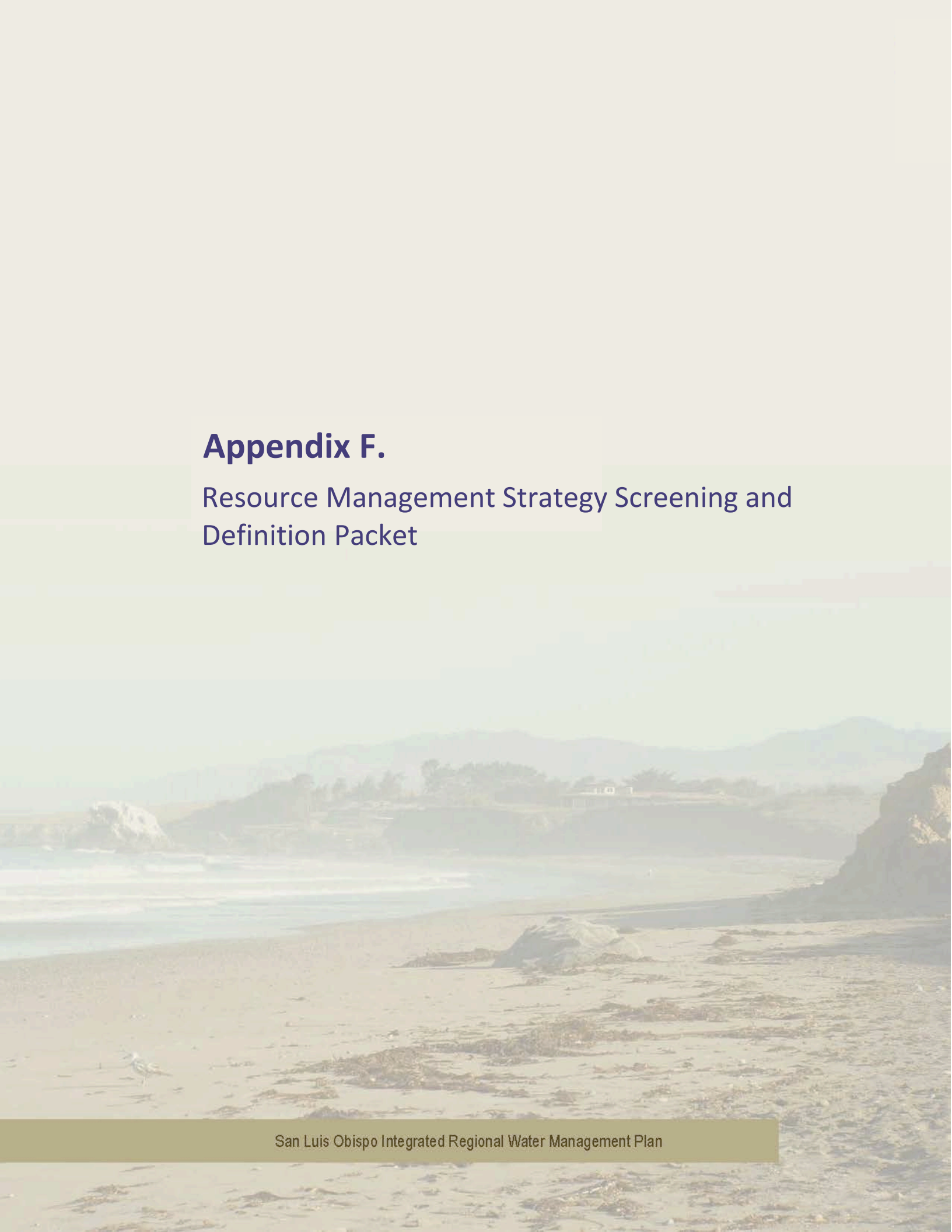
Appendix F.

Resource Management Strategy Screening and Definition Packet



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Statewide Management Objective: Increase Water Supply

June 7, 2013

Dear Stakeholder:

This packet is for your use in thinking about Resource Management Strategies (RMSs) and how they are used in developing project/program ideas. Each project/program considered for being included in the San Luis Obispo (SLO) Integrated Regional Water Management (IRWM) Plan has to satisfy the IRWM Plan Objectives adopted as draft by the Regional Water Management Group (RWMG) on June 5, 2013.

A RMS is defined by the California Department of Water Resources (CDWR) as a project, program, or policy that local agencies can implement to manage water and related resources to meet their IRWM Plan objectives. As such, we need your recommendations on which RMSs are needed to achieve our IRWM Plan Objectives. This public process is summarized in the flowchart to the right. The table below is a summary of how each RMS satisfies multiple objectives, providing a scoring system on level of benefit.

Each RMS is briefly summarized with a set of definitions and screening criteria including its effects on climate change. The goal in this exercise is to end up with a set of RMSs that, when combined and pieced together in various ways, we can promote and show the best projects/programs to potentially succeed in gaining future implementation funding.

This packet of RMS information is asking you to consider how each RMS could succeed if implemented in your Sub-Region.

If you have any questions, please call Carolyn Berg at (805) 781-5536.

Thank you very much!

Scoring of how well RMSs Satisfy the IRWM Plan Objectives:

- **Ranking 1** is where objective partially satisfies RMS when integrated with other objectives, but the types and need for projects are not likely to be submitted for the SLO Region
- **Ranking 2** is where objective satisfies RMS but project types for the SLO Region are not likely to be selected
- **Ranking 3** is where objective satisfies RMS when integrated with preferred projects
- **Ranking 4** is where objective directly satisfies RMS but not at a 100% level
- **Ranking 5** is where objective directly satisfies RMS

Some of the state RMSs were combined in cases where a California region-wide (i.e., not specific to SLO) strategy did not apply for the SLO Region and IRWM Plan. RMSs crossed out reflect those strategies decided to not be relevant, or are already included in a similar strategy for the SLO Region.

Statewide Management Objective: Increase Water Supply

Goals and Objectives	Regional Management Strategies																							
	Increase Water Supply				Improve Water Quality						Practice Resources Stewardship								Demand Reduction		Operation Efficiency		
	Conjunctive Management and Groundwater Storage	Desalination	Municipal Recycled Water	Surface Storage – Regional, Local, and CALFED	Drinking Water Treatment and Distribution	~~Groundwater Remediation~~	Matching Water Quality to Use	Pollution Prevention	~~Salt and Salinity Management~~	~~Urban Runoff Management~~	~~Agricultural Land Stewardship~~	Ecosystem Restoration	~~Forest Management~~	Land Use Planning and Management	~~Recharge Area Protection~~	~~Sediment Management~~	Watershed Management	Flood Management	Agricultural Water Use Efficiency	Urban Water Use Efficiency	Conveyance (Regional and Local)	System Reoperation	Water Transfers
Water Supply																							
1. Maximize the accessibility to existing and supplemental water supplies in the SLO Region through the utilization of existing infrastructure and development of new infrastructure and agreements.	**4**		**3**																	**4**		**3**	
2. Provide adequate and sustainable water supplies and infrastructure to address water deficiencies in all communities, including disadvantaged communities and designated low income census blocks.	**4**		**3**												2	3				**4**		**3**	

Statewide Management Objective: Increase Water Supply

3. Support sustainable potable water supply programs for rural residents.			**5**	**3**											4	2						**5**	**3**
4. Support sustainable water quality and supply programs for agriculture.			**5**	**3**											5	2						**5**	**3**
5. Support projects aimed to improve existing public water systems to meet state and federal drinking water quality standards.	**5**			**3**												2				**5**			**3**
6. Develop and implement Water Management Plans in communities of all sizes and water uses consistent with CWC requirements and accounting for environmental water needs.	**2**		**5**							5					3	2				**2**		**5**	
7. Develop and implement conservation programs, measures and practices to increase water use efficiency in all water use sectors in order to maximize water supplies.	**3**														5	5				**3**			
8. Plan for potential regional impacts of greenhouse gas emissions, climate change and droughts on water quantity and quality.															2	2							
9. Diversify water supply sources, including the use of recycled and desalinized water.			**3**													2						**3**	
10. Support watershed enhancement projects and programs to increase available water supplies to the SLO Region.			**3**	**3**																		**3**	**3**

Statewide Management Objective: Increase Water Supply

Ecosystem and Watershed																							
1. Develop watershed plans or other methods to determine the existing conditions and critical issues of each watershed or water planning area.				**3**				**5**		5													**3**
2. Preserve, enhance, restore and conserve riparian corridors and natural creek and river systems through wetland restoration, natural floodplains, riparian buffers, conservation easements, and other mechanisms to protect water supplies.			**4**	**3**				**5**														**4**	**3**
3. Increase watershed management activities (e.g., education, BMPs, monitoring, etc.) to reduce or prevent point and non-point source discharges of contaminants to surface water and groundwater resources to reduce the potential for developing additional TMDLs.				**5**												2							**5**
4. Develop public involvement and stewardship programs for public lands and ecosystems.				**3**				**5**															**3**
5. Protect and recover threatened, endangered and sensitive species through habitat restoration, stream flow management, and fish passage restoration.			**2**					**5**														**2**	
6. Reduce impacts of invasive species by removal and/or other management/control methods to promote healthy ecosystems.																							

7. Increase monitoring and promote research programs to obtain a greater understanding of the long-term effects of climate change and greenhouse gas emissions on SLO Region's watersheds and ecosystems.										4													
Groundwater Monitoring and Management Goal																							
1. Develop groundWater Management Plans, including salt and nutrient management plans, or other methods to help understand groundwater issues and conditions.			**3**	**3**																		**3**	**3**
2. Improve groundwater management with direct support of locally driven processes, including potential formation of groundwater management structures/ organizations for the purpose of implementing water supply and conservation plans, programs, and projects.				**3**																			**3**
3. Develop and implement projects and programs to further basin management objectives of local basin Groundwater Management Plans or other objectives established under other methods used to define groundwater issues and conditions.				**2**																			**2**
4. Work with local groundwater governance bodies in the development of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program for groundwater																							

basins in the SLO Region where plausible.																							
5. Evaluate and implement groundwater recharge and/or banking programs or efforts to increase the conjunctive use opportunities within the SLO Region, where technically feasible and cost-effective.			**2**																			**2**	
6. Protect and improve groundwater quality from point and non-point source pollution, including geothermal contamination and seawater intrusion.			**3**	**5**																		**3**	**5**
Flood Management Goal																							
1. Understand flood management needs per watershed or water planning area.														5									
2. Promote the implementation of Low Impact Development projects and practices to reduce storm runoff to protect infrastructure and property from flood damage.			**2**	**3**				**2**		5				5		3						**2**	**3**
3. Integrate stormwater controls, drainage and flood control structures into development projects and/or floodplain restoration to enhance natural groundwater recharge.								**3**		5				5									
4. Improve flood control infrastructure and operations and flood management strategies to reduce frequency of downstream flooding, improve water quality, and reduce upstream erosion and downstream sediment accumulation.				**2**				**3**						5									**2**

5. Develop and implement flood management and water storage projects that provide multiple benefits such as public safety, water supply, habitat protection, recreation, agriculture, and economic development.								**2**						5									
6. Develop and implement flood control projects that ensure health and safely and simultaneously protect, restore, and enhance the functions of rivers, creeks, streams, and their floodplains.			**2**	**2**				**3**						5								**2**	**2**
7. Support the adequate protection of disadvantaged communities from flooding without unfairly burdening communities, neighborhoods, or individuals.														5									
Water Resources Management and Communications																							
1. Provide consistent, consolidated and informative public outreach on the coordination of IRWM implementation projects and water resources programs.				**2**																			**2**
2. Seek funding for IRWM implementation without unfairly burdening communities, neighborhoods or individuals.																							
3. Actively support and promote local control in addressing water resource issues through establishing stakeholder groups, working with local groundwater governance bodies, and partnering with				**2**						3					2	3							**2**

governance bodies, and partnering with cities, community services districts and other water purveyors when possible.																							
4. Consider property owner rights, existing water supplies and cultural values in the planning and implementation of IRWM projects and programs.										5					4	1							
5. Support efforts by the state, local agencies, water purveyors and local groundwater governance bodies to align efforts to protect and manage water resources.				**2**											2	4							**2**
6. Seek opportunities for water management collaboration between urban, rural, and agricultural interests.															3	3							
7. Provide support and promote education for the participation of disadvantaged communities in the development, implementation, monitoring, and long-term maintenance of water resource management projects.				**3**						2					2	4							**3**
8. Promote public education programs for groundwater management, watershed protection, conservation, flood management, and water quality.				**3**				**2**		2					5	5							**3**

STATEWIDE MANAGEMENT STRATEGIES TO INCREASE WATER SUPPLY INCLUDE:

- Conjunctive Management and Groundwater Storage
- Desalination
- Municipal Recycled Water
- Surface Storage – Regional, Local, and CALFED

Conjunctive Management and Groundwater Storage

Definitions:

Groundwater development is the use of wells to economically extract water from a groundwater basin or aquifer systems for beneficial use. Ideally, the total amount of groundwater extracted annually is balanced with the amount of water recharged naturally or through intentional groundwater recharge.

Groundwater storage and banking is the intentional recharge of surface water in the available and manageable groundwater basin storage space. Recharge can be through spreading ponds, injection wells, where surface water, in-lieu of groundwater pumping, leaving water in storage in the groundwater basin for subsequent extraction and use at a later time. Groundwater storage and banking includes active monitoring and accounting for all recharge and extraction operations.

Groundwater storage operations would use locally controlled groundwater basins and facilities to store and manage available surface water. Groundwater banking implies providing or subscribing to services for use of facilities and groundwater storage space not directly under control of the entity with surface water for storage. For example, Paso Groundwater Basin interests could build groundwater storage facilities in the basin to store surface water supplies, but also could provide groundwater banking services to others, thus creating a revenue stream and sharing of costs.

Conjunctive water management is the coordinated and combined use of surface water and groundwater to increase the overall water supply to a region and improve the reliability of that supply. Conjunctive use implies that there are some safe or sustainable yields from the groundwater

basin.

State RMS Definition of Conjunctive Management:

> *Conjunctive management or conjunctive use refers to the coordinated and planned use and management of both surface water and groundwater resources to maximize the availability and reliability of water supplies in a region to meet various management objectives. (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

The evaluation and development of groundwater storage and banking projects/programs aligns directly with objectives of the Groundwater Management Goal, and crosses over to multiple objectives in other goals. Groundwater storage would help to meet the goal to diversify the regional water supply portfolio and ensure a long-term, verifiable, reliable, and sustainable supply to meet current and future agricultural, urban, rural, and environmental demands. Groundwater banking and storage would help meet multiple objectives by:

- Helping to avoid impacts to existing users
- Providing a firm, verifiable, and sustainable supply
- Supporting protection of surface water rights by making full use of entitlements for groundwater banking purposes

Complexity

Groundwater storage and banking locally in the North County (Paso Groundwater Basin) and South County (Santa Maria Groundwater Basin) Sub-Regions would likely require integration with recycled water and desalination strategies. Legal, political, and technical issues remain to be addressed but no fatal flaws have been identified. Technical issues related to water quality, hydrogeology, and operations need to be further addressed.

Interregional groundwater storage and banking in the North County Sub-Region (Paso Groundwater Basin) can be through use of the state Water Project Pipeline using existing water entitlements, and through use of Nacimiento Reservoir entitlements, and construction of conveyance and treatment

facilities. Both are technically feasible but require further study and analysis of specific site conditions. There are more political and legal complexities when compared to locally controlled facilities or groundwater storage areas.

Resolve Conflicts

Groundwater banking and storage of excess surface water in wet years and wet months could provide a firm, verifiable, and sustainable supply for new users in lieu of extracting groundwater from the Paso Basin. Banked supplies can be apportioned between current users and new users; agriculture, urban, and rural. This would support land use agencies when making findings and determinations on available supplies and impacts to current users pursuant to state law SB610 and SB221. This will result in reducing the potential for local conflicts between existing groundwater users and the land use agencies; between current and future water users; and between the types of use.

Regional Benefits

Groundwater storage and banking would provide regional benefits to the Paso Groundwater Basin and Santa Maria Groundwater Basin users by increasing the quality and reliability of the groundwater supply, protecting the local water rights, and ensuring reasonable and beneficial use of both surface water and groundwater entitlements.

Timeliness

Groundwater banking and storage projects need to be further defined through a feasibility study and/or additional pilot and demonstration projects. Project alternatives are still being developed and compared, and a preferred alternative has not been selected. Further explorations, field work, or pilot and demonstration projects would fill data gaps, test and demonstrate the technologies and operational concepts, and support completion of alternatives evaluation and final design of full scale projects

Political Acceptability, Local and Regional

In general, there is support for groundwater storage and banking in the SLO Region. Such support is expected to increase with greater understanding and awareness of the need to protect indigenous groundwater and to perfect surface water rights. Ability to pay and willingness to pay, cost benefits

analysis, cost distribution and fiscal evaluation have not been fully determined and requires additional economic evaluation to gage acceptability and compare to other structural and non-structural alternatives.

Adapting to Climate Change

Groundwater banking and storage would allow the SLO Region to make maximum use of the surface water entitlements and improve the ability for the SLO Region to respond to variable climate conditions. Regardless of the long-term effects of climate change to SWP or Nacimiento entitlements, whether increase or decrease to the flows, groundwater banking would help the SLO Region respond to vulnerabilities, make maximum beneficial use of the current entitlements, and help meet IRWM Plan Objectives.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for additional groundwater development (e.g., increased agriculture or urban demands)?

How might these opportunities include groundwater storage and banking element?

Explain how well these opportunities fall within your Sub-Region where there is (or will be) an adopted Groundwater Management Plan?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- The number one priority for the RWMG should be to develop groundwater storage and banking facilities to capture and protect surface water rights.
- Develop Groundwater Management Plan elements to support groundwater storage and banking projects and meet requirements for state grant funding.
- Conduct needed feasibility studies and/or pilot and demonstration projects to obtain needed data, select a preferred groundwater banking alternative and develop final project designs and funding requirements.
- Seek state and federal grant funding to conduct the needed evaluations and pilot projects.

Additional Recommendations:

Desalination

Definitions:

Desalination comprises various water treatment processes for the removal of salt from water for beneficial use. Desalination is used to treat seawater as well as brackish groundwater (water with a salinity that exceeds normally acceptable standards for municipal, domestic, and irrigation uses, but less than that of seawater).

Desalination technologies typically include reverse osmosis (RO). This process can be used to remove salt as well as specific contaminants in water such as trihalomethane precursors, volatile organic carbons, nitrates, and pathogens.

Desalination uses typically include direct use as a drinking water supply, groundwater recharge with injection to halt sea water intrusion, groundwater recharge through recharge basins, or non-potable uses to supplement recycled water supplies.

State RMS Definition of Desalination:

> *Include desalination, where economically and environmentally appropriate, as an element of a balanced water supply portfolio, which also includes conservation and water recycling to the maximum extent practicable. (DWR, 2003)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Desalination of sea water or brackish groundwater could help to meet the Objective 9 of the Water Supply Goal to diversifying the regional water supply portfolio and ensuring a long-term, verifiable, reliable and sustainable supply to meet current and future agricultural, urban, and environmental demands. Desalination would help meet objectives by proving a new water source to avoid impacts to existing users.

- Helping to avoid impacts to existing users by providing a new supply
- Supporting disadvantaged and other communities in meeting wastewater disposal and permit requirements when coupled with as a regional strategy for use of this water and funding

facilities

- Matching water quality to appropriate uses and supplying treated wastewater to extend use of constrained surface water supplies
- Improving wastewater effluent discharge water quality to fresh water rivers and ocean
- Support meeting 20% conservation goals in the SLO Region

Complexity

Desalination technologies for brackish water are relatively well defined and relatively cost-effective as compared to other opportunities to develop new water supplies. Constraints to be overcome include: mitigation requirements to potential impacts related to concentrated effluent discharge; sea water intakes and the impact on marine life; and carbon footprint due to high energy use.

Resolve Conflicts

Desalination could reduce conflicts over existing water supplies by providing a firm supply for new users and projects in-lieu of increased groundwater use or use of constrained surface water supplies.

Regional Benefits

Desalination would provide regional benefits by increasing the supply and by providing water for economic development while protecting existing urban, agricultural, rural, and environmental uses.

Timeliness

Projects to desalinate brackish groundwater could be developed in the near- to mid-term since the local water purveyors and the County could work cooperatively with industry to develop and permit such projects.

Adding a groundwater recharge component as an end-use for desalinated water could slow project development and implementation, but an integrated project could be developed in phases over the mid- to long-term.

Desalination ocean intake structures and effluent discharge methods would likely require environmental review and a longer time period to design, permit, implement, and could encounter

significant regulatory compliance requirements.

Political Acceptability, Local and Regional

The method of financing and distribution of costs between existing and future customers needs to be determined. Ability to pay and willingness to pay for desalination has not been fully determined and requires additional economic evaluation.

Adapting to Climate Change

Desalination of brackish water sources would develop an untapped resource and improve the ability for the SLO Region to respond to variable climate conditions.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities for Desalination Development (e.g., increased agriculture or urban uses of water supplies)?

How might these opportunities gain political support and funding?

Statewide Management Objective: Increase Water Supply

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Desalination of ocean water or brackish groundwater is a near- to mid-term proposition and could be sustainable when integrated with groundwater recharge project elements.
- Phased projects should be undertaken to pilot and take advantage of current technologies.
- Monitoring and reporting elements should be undertaken to determine the feasibility of large scale water supply and groundwater recharge projects.
- Federal or state funding opportunities for development of pilot projects should be pursued if local funding match can be developed.
- Local government and water purveyors should coordinate and adopt appropriate policies to allow for and promote development of desalination projects.
- Consider and further evaluate economic and political feasibility for including desalinated water as a source of direct groundwater recharge.
- Cooperative public/private partnerships should be investigated for purposes of creating a new water supply for non-agricultural water users using desalination technologies.
- Economic incentives and pricing would need to be worked out to finalize a business model, and additional economic evaluations are recommended.

Additional Recommendations:

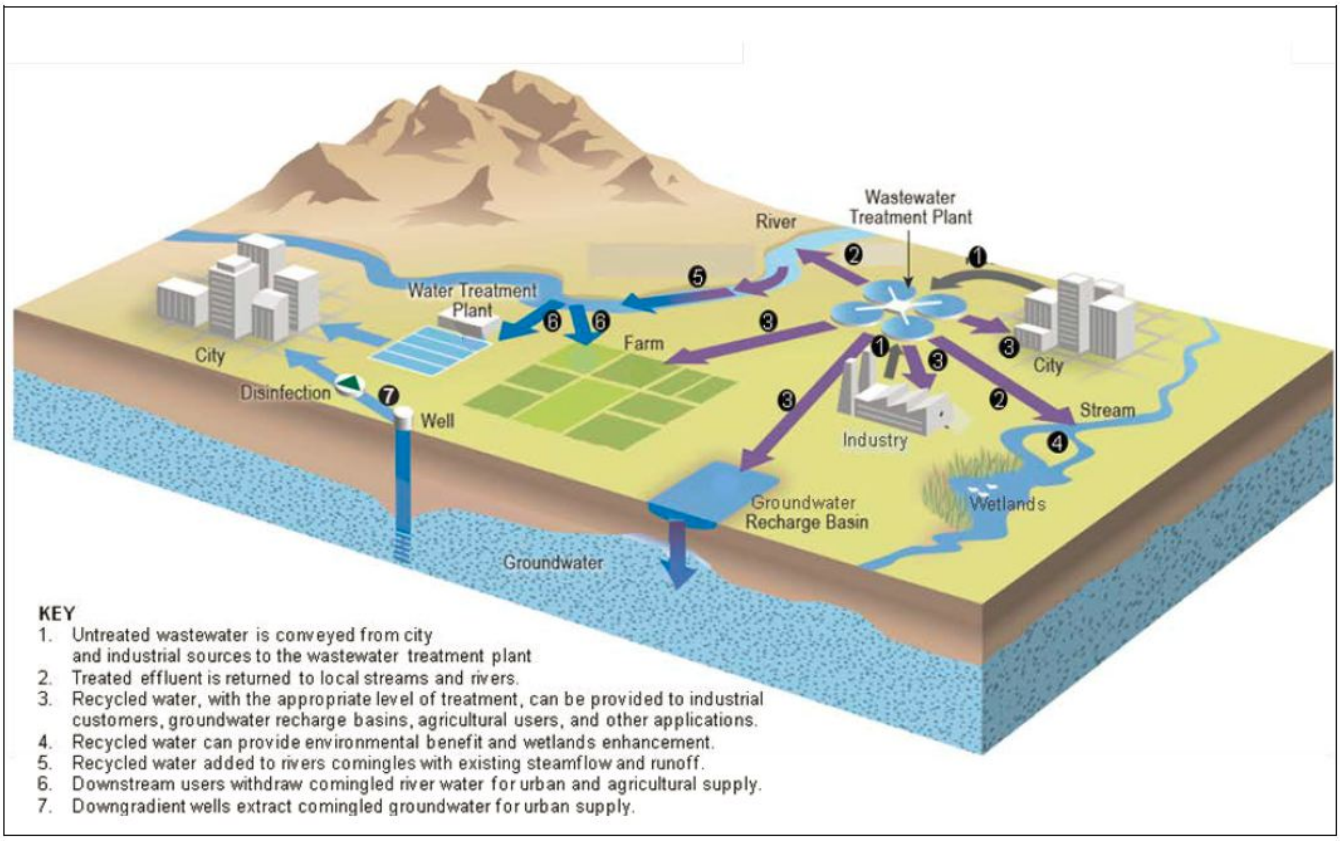
Municipal Recycled Water

Definitions:

"**Recycled water**" and "**reclaimed water**" have the same meaning and can be used interchangeably.

Recycled water originates from wastewater produced by city and industrial sources and conveyed to a regional wastewater treatment plant; from there it is treated and conveyed to uses, as illustrated in the figure below.

Recycled water typically replaces the need for potable drinking water supplies for outdoor irrigation in urbanized areas for uses such as schools, parks, and landscape corridors. The term, "purple pipe" system refers to the dedicated distribution system for recycled water or other high-quality non-potable water supplies (e.g., groundwater remediation).



Source: (DWR, 2013)

Statewide Management Objective: Increase Water Supply

State RMS Definition of Recycled Water:

> *…water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource (Wat. Code § 13050(n)). (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Recycled municipal wastewater would help to meet the goal to diversify the regional water supply portfolio and ensure a long-term, verifiable, reliable and sustainable supply to meet current and future agricultural, urban and environmental demands. Recycled wastewater would help meet objectives by:

- Helping to avoid impacts to existing users by providing a new supply
- Supporting disadvantaged and other communities in meeting wastewater disposal and permit requirements when coupled with as a regional strategy for use of this water and funding facilities
- Matching water quality to appropriate uses and supplying treated wastewater to extend use of constrained surface water supplies
- Improving wastewater effluent discharge water quality to fresh water rivers and ocean
- Support meeting 20% conservation goals in the SLO Region

Complexity

Treatment technologies to recycle municipal wastewater are well established. Complexity would be related to integrating funding strategies for upgrading existing plants or developing regional wastewater facilities to recycle wastewater. There are some permitting issues that would need to be resolved to use as a non-potable water source for outdoor irrigation.

Resolve Conflicts

Recycling municipal wastewater would be relatively neutral. This practice would demonstrate the

regional commitment to making use of this resource. Recycling municipal wastewater could provide a firm, verifiable, and sustainable supply for new users in lieu of dependency on constrained groundwater and surface water supplies. This would support land use agencies when making findings and determinations on available supplies and impacts to current users pursuant to state law SB610. This would result in reducing the potential for local conflicts between water purveyors and land use agencies; between current and future water users; and between the types of use.

Regional Benefits

A regional strategy to reclaiming municipal wastewater could provide regional benefits by helping to meet the requirements to conserve 20% by 2020; increasing the reliability of the supply portfolio; recharging groundwater aquifers through in-lieu and direct recharge (i.e., the state is currently drafting new regulations allowing for use of recycled water as a direct groundwater recharge source of supply); and supporting economic development.

Timeliness

A number of potential recycled municipal wastewater facilities are currently in the planning and design stages [NEED Report on Recycled Water Assessment], and a number of projects are near or ready to proceed. Regional strategies and policies are needed to account for the conserved water and use of this source in lieu of groundwater or surface water. Development of regional plants to realize economies of scale and increase cost effectiveness will take more time.

Political Acceptability, Local and Regional

Upgrade to individual plants without subsidy by new water users would encounter political opposition due to increase in rates required to fund upgrades to existing plants. Regional plants could be resisted due to loss of control of individual facilities. Regional strategies for accounting for the conserved water also could face opposition. Grower resistance related to marketability of crops.

Adapting to Climate Change

Recycling municipal wastewater would help to adapt to climate change by secondary uses, and by providing flexibility in operations, and increase ability to respond to changing conditions.

Statewide Management Objective: Increase Water Supply

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities for additional recycled water development (e.g., new source of supply for non-consumptive agriculture crops or non-potable urban uses)?

How might these opportunities include a significant reduction in the current use of groundwater and surface water supplies?

Explain how well these opportunities apply to your Sub-Region (e.g., an existing regional wastewater treatment plant needing to state discharge requirement)?

Statewide Management Objective: Increase Water Supply

Additional Sub-Region Stakeholder Findings:

- Recycling all forecasted future municipal wastewater flows would only provide an estimated total of _____acre-feet per year, which is a little more than _____ of the future forecasted demand. If all the wastewater available was recycled, it would only provide a percentage of the future demand.
- Support current wastewater facility plant upgrades that propose recycling municipal water for use as part of meeting sustainable water supplies for new growth in urban and agriculture uses.
- Create partnerships and meet multiple IRWM Plan goals by using recycled wastewater for this purpose where cost effective and timely.
- Consider regional municipal water recycling projects to increase cost-effectiveness (economies of scale) of project development and operation, provide benefits to multiple parties, and improve opportunities to reuse the water (reduce cost of "purple pipe" system).
- Provide policy and financial incentives for public/private partnerships to construct municipal recycling facilities and for crediting the produced water to sponsoring entities (public/private) to allow for exchange of treated drinking water.
- Continue to evaluate the cost-effectiveness and political viability of regional municipal wastewater treatment facilities that include recycling wastewater as part of the mid- and long-term water management strategy.
- Continue to monitor the state's draft regulations for the use of recycled water for direct groundwater recharge through recharge basins and injection.

Additional Recommendations:

Surface Storage – Regional, Local, and CALFED

Definitions:

Surface storage is a strategy typically used to collect and store rainfall and stormwater runoff during the wet months of the year for later releases during the dry months of the year where the water is transferred to agencies with contracts (or water rights) specifying the discharge rate and maximum annual volume.

Both on- and off-stream storage refer to man-made surface storage for impounding water to achieve multiple benefits including: 1) water supply reliability against catastrophic events and droughts; 2) operational flexibility to meet peak summer water demands; 3) water quality improvement; 4) flood control; 5) hydropower; and 6) capturing excess flows.

Surface Storage operations typically allow for recreational boating and fishing throughout the year by maintaining a minimum storage that is carried over from one year to the next.

Environmental releases are often needed as mitigation of surface storage projects to maintain anadromous fish populations in downstream rivers.

State and federal surface water projects are a system of reservoirs located throughout California with major conveyance systems to provide water to agricultural and urban areas.

State RMS Definition of Surface Storage:

> *Surface storage is the term for the use of man-made, above-ground reservoirs to collect water for later release when needed….*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Surface storage aligns with many of the SLO Region IRWM Plan's Goals and Objectives because of the water supply, flood management, and groundwater recharge, and environmental and recreational values. Surface storage is a preferred alternative for creating new water, providing flood management, and securing additional supplies for drought protection and emergency failures in other supplies. Incidental benefits are recreation, groundwater recharge, and controlled river flows.

However, surface storage projects come at a high monetary and a high environmental cost.

The IRWM Plan Region currently makes use of four reservoirs: Salinas (Santa Margarita Lake), Whale Rock, Lopez Lake, and Nacimiento. All four benefit the management of water resources and play an important role in the IRWM region's water supplies, flood protection, and groundwater recharge.

Complexity

Implementing Surface Storage projects takes many years of planning and developing feasibility and environmental studies to support the project's construction. Local agencies are further constrained because of the resources to manage and complete such a complex project. Land acquisition and relocating roads and small communities takes time and money. More often, an existing dam is raised in elevation to provide additional storage if the upstream watershed captures the additional volume, or water is pumped (off-stream storage) into the reservoir from nearby canals. Lastly, legal, political, and technical issues are often difficult to overcome.

Resolve Conflicts

Similar to groundwater banking and storage, surface storage of excess surface water in wet years and wet months could provide a firm, verifiable, and sustainable supply for new users in lieu of extracting groundwater or finding unused water entitlements. Stored supplies can be apportioned between current users and new users; agriculture, urban, and rural. This would support land use agencies when making findings and determinations on available supplies and impacts to current users pursuant to state law SB610 and SB221. This will result in reducing the potential for local conflicts between existing users and the land use agencies; between current and future water users; and between the different types of land use.

Regional Benefits

Surface storage would provide regional benefits in providing in-lieu and direct recharge of the SLO Region's groundwater basins. Such a project will also protect the local water rights and ensure reasonable and beneficial use of both surface water and groundwater entitlements.

Timeliness

Implementing Surface Storage projects takes many years of planning, as does developing feasibility and environmental studies to support the project's construction. Time is often measured in decades

to bring a Surface Storage project from inception to completion, and fatal flaws can occur anywhere along the way.

Political Acceptability, Local and Regional

In general, Surface Storage projects in the SLO Region are considered to be too high in price as it relates to environmental impacts and impacts to the livelihood of lands to be inundated. Ability to pay and willingness to pay, and a typically low benefit-cost ratio analysis make large surface storage projects infeasible.

Adapting to Climate Change

Surface storage would allow the SLO Region to make maximum use of the surface water entitlements and improve the ability for the SLO Region to respond to variable climate conditions. Regardless of the long-term effects of climate change to SWP or Nacimiento entitlements, whether increase or decrease to the flows, additional storage will help respond to vulnerabilities, make maximum beneficial use of the current entitlements, and help meet IRWM Plan Objectives.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements (or attributes) of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for additional Surface Storage (e.g., increased agriculture or urban demands) projects?

Statewide Management Objective: Increase Water Supply

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Conduct a study on the North Coast Sub-Region and the South Coast Sub-Region using surface water storage in local watersheds for adapting to climate change.
- Evaluate the impacts of forecasted curtailments in SWP surface water and future plans by the state to build new storage reservoirs north of the Delta.
- Consider opportunities for off-stream reservoirs in the North County Sub-Region.

Additional Recommendations:

Statewide Management Objective: Improve Water Quality

STATEWIDE MANAGEMENT STRATEGIES TO IMPROVE WATER QUALITY INCLUDE:

- Drinking Water Treatment and Distribution
- Matching Water Quality to Use
- Pollution Prevention
- Salt and Salinity Management

Not Considered for Meeting SLO Region IRWM Plan Goals and Objectives:

- Urban Runoff Management

Drinking Water Treatment and Distribution

Definitions:

Drinking Water Treatment and Distribution requires that water treatment plant systems can treat raw water supplies to drinking water quality standards, and conveyance is sized to adequately serve and maintain the same high water quality for purposes of human consumption, outdoor irrigation, and at volumes and pressures for emergency fire flows.

Drinking Water Treatment facilities use a range of technologies to meet first and secondary water treatment standards.

Groundwater treatment often requires only chemical and filtration systems to remove naturally occurring constituents such as iron and manganese.

Surface water treatment requires conventional systems using flocculation, settling basins, and filtration.

State RMS Definition of a Public Water System:

> *…a system for the provision of water for human consumption, through pipes or other constructed conveyances, which has 15 or more service connections or regularly serves at least 25 individuals daily at least 60 days of the year (Health & Saf. Code, § 116275(h).). (DWR, 2013)*

Statewide Management Objective: Improve Water Quality

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

The SLO Region IRWM Plan has approximately 180 state-defined public water systems ranging from very small, serving a single complex or industry, to large, serving cities and communities. Each requires continuous monitoring for both available quantity and quality. Many of the Objectives of the Water Supply Goal are aligned with this RMS in some manner, as follows:

- Improves utilization and operations of existing conveyance systems
- Addresses water treatment and conveyance deficiencies
- Provides sustainable drinking water supplies to address communities, including disadvantaged communities (DACs)
- Supports improvements to existing public drinking water system to meet state and federal drinking water quality standards
- Implements portions of a community's Water Management Plan
- Integrates with system-wide conservation programs through operations and pricing

Complexity

Water treatment plant and conveyance system improvements are relatively straight forward. A needs and feasibility study are required as well as CEQA documentation and predesign to seek funding. Depending on the size of the water system, funding can come from various sources to supplement existing rate payers. System improvements for new growth can be financed and paid through development fee programs. System sizing for new development creates political and environmental complexities when compared to simply upgrading a failing water system supporting existing customers.

Resolve Conflicts

Feasibility studies and design reports for new or upgrading water treatment and conveyance facilities would support land use agencies when making findings and determinations on available supplies and

impacts to current users pursuant to state law SB610 and SB221. This will result in reducing the potential for local conflicts between existing users and the land use agencies; between current and future water users; and between the types of use.

Regional Benefits

When combined with other RMSs, the construction of new or upgraded water treatment and conveyance facilities increase the quality and reliability of both surface water and groundwater supplies, protecting the local water rights and ensuring reasonable and beneficial use of both surface water and groundwater entitlements.

Timeliness

IRWM Plan projects pertaining to water treatment and conveyance systems already exist throughout the SLO Region in various states within the planning and design process, with most awaiting some form of financial support. Prioritization in expediency should be given to DACs or other low income areas where drinking water quality is below primary state and federal drinking water standards.

Political Acceptability, Local and Regional

In general, there is support for most water treatment and conveyance facility projects in the SLO Region. Ability to pay and willingness to pay, and benefit-cost analyses are needed to fully gage the acceptability of the preferred alternative.

Adapting to Climate Change

Any improvement in the sustainability of drinking water supplies helps the SLO Region respond to climate change vulnerabilities by making maximum beneficial use of the current entitlements. Regionalization of water supply systems as an adaptation strategy also helps to counter the effects of climate change by adding distribution flexibility during periods of drought or flooding.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

Statewide Management Objective: Improve Water Quality

What are the opportunities (or needs) for water treatment and/or conveyance system improvements?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- The RWMG should identify and prioritize (identify critical needs) all communities with drinking water system deficiencies including the ability to meet fire flows and peak summer demands.
- Develop Water Management Plan elements to support water system improvements, promote regionalization of both treatment and conveyance systems, and meet requirements for state grant funding.
- Conduct needed feasibility and environmental studies to develop final project designs and funding requirements.
- Seek state and federal grant funding to support critical system improvements.

Additional Recommendations:

Matching Water Quality to Use

Definitions:

Matching Water Quality to Use is a strategy used to promote the idea of comparing the quality of the raw water supply with the intended use, and then bringing t.

One example is groundwater, which is considered to be the best and highest quality source of drinking water in the SLO Region; thereby making an allocation preference to urban, industrial and rural uses.

Fresh surface water, considered to be a clean source of supply, but of less quality than groundwater, could have an allocation preference to agricultural or environmental/aquatic uses.

For agricultural and instream uses, water quality matching is an integral part of water quality management because there is generally no treatment of these water supplies prior to their use.

State RMS Definition of Matching Water Quality to Drinking Water:

> *For drinking water, appropriately matching high quality source waters can reduce the levels of pollutants and pollutant precursors that cause health concerns in drinking water. In addition, less costly treatment options can be used when water utilities start with higher quality source waters. In turn, water supply reliability is enhanced and multiple barriers of protection for public health are assured. (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

As a resource strategy, full implementation of a "Matching Water Quality to Use" program would require significant investment in regionalization of groundwater, surface water, recycled water, and desalinized water treatment and conveyance facilities.

This strategy also includes no-cost seasonal exchanges between urban and agricultural water users. Surface water supplies can be transferred to agriculture using urban surface water rights during the peak agricultural water demand period. During these periods, agricultural users would be forced to use groundwater and face pumping constraints in quantity, quality and energy costs. In return for access to urban surface water supplies, the agricultural user returns a similar amount of higher

quality pumped groundwater during the fall-winter period when there is excess groundwater pumping capacity. In cases where place-of-use laws are enacted, transfers would likely have to be within the same region.

Initially, smaller projects can be formulated to push raw source water to the highest beneficial use without treatment, and then consider the level of cost if treatment is required for the same use. This methodology or approach in strategy implementation addresses the following Objectives:

1. Matching untreated groundwater with rural drinking water uses.
2. Matching untreated surface water with rural and agricultural irrigation uses.
3. Making this strategy a part of a communities Water Management Plan where indoor and outdoor uses share in the allocation of overall least cost alternatives, such as, developing a recycled water system for outdoor irrigation rather than extracting additional groundwater (high quality, drought protection), or develop surface water supplies (in cases where there is no groundwater) better suited for potable drinking water supplies and/or maintaining minimum environmental flows.

Complexity

Regionalization of water facilities has inherent complexities typically associated with multi-agency efforts. Such projects are feasible and typically result in the optimum use of water while protecting high quality raw water supplies for drinking water. Initial funding of larger regional projects may be challenging to smaller low income communities.

Resolve Conflicts

Matching water quality to use could reduce conflicts over existing water supplies by providing firm supplies that are sustainable for the applied use. Creating alternative supplies to groundwater for outdoor irrigation use would provide natural in-lieu recharge to over drafted groundwater basins.

Regional Benefits

Matching water quality to use would provide regional benefits by increasing the supply in cases where recycled or desalinized water are needed based on the criteria applied to this strategy. Application of this strategy may be a viable option in the case of new water to support economic development.

Timeliness

Matching water quality to use projects could start up slowly with phased programs to provide regional projects. For large recycled water treatment and conveyance systems, the period to design, permit, and implement and could encounter significant regulatory compliance requirements.

Political Acceptability, Local and Regional

The method of financing and distribution of costs between existing and future customers needs to be determined. Ability to pay and willingness to pay for this strategy has not been fully determined and requires additional economic evaluation.

Adapting to Climate Change

A program of matching water quality to use could maintain standards for drought protection and flooding to improve the ability for the SLO Region to respond to variable climate conditions.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities for matching water quality to use?

How might these opportunities gain political support and funding?

Statewide Management Objective: Improve Water Quality

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- New development should support use and development of impaired quality where cost effective and where such uses could provide economic benefits to the SLO Region.
- Phased projects should be undertaken to begin to evaluate regionalization of water systems for purposes of matching water quality to use, and demonstrate economic use of poor quality water to expand the water supply portfolio and support economic growth.
- Federal or state funding opportunities for development of pilot projects should be pursued if local funding match dollars can be developed.
- Local government and water purveyors should discuss the merits of this strategy and the types of regional partnerships that could be implemented to regionalize raw water supplies for treatment and conveyance to corresponding best and highest beneficial uses.

Additional Recommendations:

Pollution Prevention

Definitions:

Pollution prevention maintains water to its highest quality.

Maintaining the highest water quality opens up the broadest spectrum of users (e.g., degradation of river water quality from wastewater effluent [point source discharges] reduces opportunities for use as an urban supply with further degradation limiting agricultural supplies).

An important pollution prevention strategy is implementation of proper land use management practices to prevent sediment and pollutants from entering the source water.

Non-point sources of pollution due to land use activities are the most difficult to regulate.

State RMS Definition of Pollution Prevention:

> *…the legal doctrine of "public trust" demands that the state protect certain natural resources for the benefit of the public, including uses such as fishing, protection of fish and wildlife, and commerce, all of which are affected by pollution. (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Pollution prevention is a primary objective of multiple goals with many directed at reducing the amount of pollutants entering the environment and drinking water sources of supply. Objectives aligned with this RMS are as follows:

- Support projects to improve water quality in drinking water supplies
- Support watershed enhancement programs
- Provide ecosystem enhancement mechanisms to protect water supplies
- Increase watershed management activities to prevent point and non-point discharges to surface water or groundwater to minimize the need for enforcement of additional Total Maximum Daily Loads actions

- Develop public education and involvement programs for watershed enhancement
- Protect groundwater from point and non-point pollution discharges
- Improve flood control infrastructure to improve water quality and upstream erosion of soils
- Support low impact development to reduce pollutants from increased runoff and protection of natural recharge areas

Complexity

State and federal regulatory programs are already in-place and actively enforced through the National Pollutant Discharge Elimination System (NPDES) permitting process. This program has been effective in targeting point source discharges to both surface water and groundwater. However, non-point source pollutants are still of concern and difficult to regulate. Anti-degradation policies further enforce the need to maintain water quality of supplies to highest beneficial use. Programs directed at non-point source pollutants generally require softer programs such as public outreach and education; long-term monitoring to understand legacy pollutants (i.e., actions from past disposal practices); and the baseline of water quality in each source.

Resolve Conflicts

Continuous regulatory requirements to reduce pollutants from upstream point source effluent discharges will resolve issues surrounding the concern of downstream users having to use upstream wastewater discharges. Similar conflicts with upstream livestock or agricultural runoff making its way to surface and groundwater supplies may be reduced through non-point source regulatory measures.

Regional Benefits

When combined with Matching Water Quality to Use strategies, the SLO Region can direct its efforts in non-point source programs to produce the best and highest quality water for its intended beneficial use.

Timeliness

Current state and federal regulatory measures are already in place for implementation of pollution

prevention programs. Finding the right balance of dedicated resources, for both staff and funding, to public outreach, education and enforcement programs need to be analyzed to ensure the highest benefit-cost ratio.

Political Acceptability, Local and Regional

In general, there is support for implementing pollution prevention programs for point and non-point source discharges

Adapting to Climate Change

Any improvement in the sustainability of drinking water supplies helps the SLO Region respond to climate change vulnerabilities by making maximum beneficial use of the existing supplies allowing for flexibility during periods of drought or flooding.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for pollution reduction measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Develop Water Management Plan elements to support anti-degradation policies

- Conduct needed monitoring, and feasibility and environmental studies to support the implementation of non-point source discharge reduction measures
- Seek state and federal grant funding to support public education and practices aimed at reducing manmade pollution discharge
- Continue to participate in state and federal programs directed and monitoring, assessments, and investigations of how pollution is entering both freshwater supplies and the ocean

Additional Recommendations:

Salt and Salinity Management

Definitions:

Salt and Salinity Management is directed at accounting for the total accumulated salts in a region, and begin to seek management activities to remove the salt before lands are rendered sterile from high salinity concentrations in agricultural soils.

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

The predominance of salt management is taking place along the coastal areas where salinity intrusion is being managed. Any saline water resulting from the pumping of groundwater with desalinization treatment is discharged back into the ocean. Future actions to treat saline groundwater and inject the treated water to act as a barrier to further intrusion are being considered.

In the case of inland areas overlying over drafted groundwater basins, due to recent increases in groundwater extractions by the combination of urban and agricultural pumping, saline water (Total Dissolved Solids > 2000 mg/l) is upwelling into fresh water aquifer zones used by public wells, agriculture wells, and private rural wells. The following excerpt on actions taking place in the community of Paso Robles for the protection of drinking water supplies is taken from the Master Water Report.

> *Nonetheless, salt loading to the groundwater basin is an important long-term concern. Recognizing that the City's wastewater disposal is one source of salt loading, the Paso Robles has made the reduction of salt loading one of their water resource goals. Major means to reduce salt in the city wastewater, include planned use of high-quality Lake Nacimiento supply, reduced use of home water softeners, strategic use of wells with lower salt concentrations, and implementation of an industrial waste discharge ordinance. Support projects to improve water quality in drinking water supplies.*

Salinity Management would help meet objectives by proving a new water source to avoid impacts to existing users.

- Maximizing the accessibility and diversification of alternative water supplies other than

groundwater in critical areas of salinity upwelling

- Provide sustainable water supplies for agriculture, urban, and rural areas by actively managing groundwater basins
- Develop Groundwater Management Plans including salt and nutrient management plans
- Provide support and education in all communities, including DACs, reliant on threatened groundwater supplies

Complexity

The groundwater community understands that the solution to saline groundwater in critical areas cannot be overcome with treatment methods or other hard project solutions. The answer is in reducing groundwater pumping by use of alternative water supplies or more efficient water use.

Resolve Conflicts

Groundwater conflicts are prevalent in the community due to the real concern of private wells going dry or becoming contaminated with salt water. Resolution of over pumping the basin can help to resolve many of the conflicts and potential legal actions currently taking place.

Regional Benefits

If managed, the regional benefits are broad and inclusive of all stakeholders overlying a groundwater basin.

Timeliness

Development of local groundwater management governance and adoption of a GMP and its implementation take time and effort amongst the community. The critical need taking place in the present can certainly expedite processes the generally take years to accomplish.

Political Acceptability, Local and Regional

In general, there is support for implementing groundwater management and governance activities.

Adapting to Climate Change

Any improvement in the sustainability of drinking water supplies helps the SLO Region respond to climate change vulnerabilities by making maximum beneficial use of the existing supplies allowing for flexibility during periods of drought or flooding.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for pollution reduction measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? Below are suggested based on previous studies and the 2007 IRWM Plan and the Master Water Report. Please circle those that you align with and provide additional recommendations, if needed.

- Creation of groundwater management governance body
- Develop and adopt a GMP for impacted basins
- Increase the use of alternative water supplies, such as Lake Nacimiento
- Reduce use of home water softeners that add salt to the treated wastewater stream.
- Strategically place urban and agriculture wells in portions of the aquifer with lower salt concentrations and reduced contribution of the salinity upwelling

- Implementation of an industrial waste discharge ordinance

Additional Recommendations:

Urban Runoff Management

Definitions:

Urban runoff management is a broad series of activities to manage both stormwater and dry weather runoff for the purposes of reducing pollutants being introduced into higher quality sources of water supply.

RMS is not considered for meeting IRWM Goals and Objectives:

Urban runoff management is closely related to both Pollution Prevention and Matching Water Quality to Use, and is considered to be included within the recommendations of both strategies.

Comments:

STATEWIDE MANAGEMENT STRATEGIES TO PRACTICE RESOURCES STEWARDSHIP

- Ecosystem Restoration
- Land Use Planning and Management
- Watershed Management

Not Considered for Meeting SLO Region IRWM Plan Goals and Objectives:

- Agricultural Land Stewardship
- Forest Management
- Recharge Area Protection
- Sediment Management

Agricultural Land Stewardship

Definitions:

Agricultural Land Stewardship's primary goal includes activities to help landowners maintain their farms and ranches rather than being forced to sell their land because of pressure from urban development.

State RMS Definition:

> *Agricultural land stewardship broadly means the conservation of natural resources and protection of the environment. Agricultural land stewardship also protects open space and the traditional characteristics of rural communities, as well as open space within urban areas. (DWR, 2013)*

RMS is not considered for meeting IRWM Goals and Objectives:

Agricultural Land Stewardship is not considered to be included within SLO Region IRWM Plan Goals

and Objectives. Conservation of resources and environment are addressed in Ecosystem Restoration and Land Use planning and Management.

Comments:

Ecosystem Restoration

Definitions:

Ecosystem Restoration is a soft management strategy to work towards restoring lands and waters touched by man to their pre-development condition.

Reproducing natural flows often requires targeting of waste and pollution discharges from upstream development.

Restoration also includes at-risk species whose abundance and geographic range have diminished over the development period of urban, rural and agricultural lands.

State RMS Definition:

> *Ecosystem restoration improves the condition of our modified natural landscapes and biological communities to provide for their sustainability and for their use and enjoyment by current and future generations. (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

The ecosystems restoration strategy focus is on restoration of aquatic, riparian and floodplain ecosystems because these are the natural systems most directly affected by water and flood management action and climate change. Ecosystem Restoration is consistent with the primary IRWM Plan Goal:

> *Maintain or improve the health of the Region's watersheds, ecosystems, and natural resources through collaborative and cooperative actions, with a focus on assessment, protection, and restoration/ enhancement of ecosystem and resource needs and vulnerabilities.*

Key objectives of implementing this strategy are summarized as follows:

1. Development of watershed plans to determine critical issues in targeting restoration actions.
2. Restore natural systems through conservation and easements to protect water supplies.
3. Develop public involvement and stewardship programs.
4. Protect and recover threatened and endangered species.

5. Reduce invasive species.
6. Increase monitoring to obtain a better understanding of climate change on ecosystems.

Complexity

Given the soft nature of this activity, developing cost effective projects/programs which show a high benefit-cost ratio becomes difficult. Often times, ecosystem restoration activities will be included with larger water resources water supply and flood control projects as mitigation to the project.

Resolve Conflicts

Pressure from environmental interests over concerns with new development will be reduced by implementation of ecosystem restoration actions (e.g., purchasing or granting a conservation easement).

Regional Benefits

Ecosystem restoration provides secondary benefits to improved water quality for both surface water and groundwater.

Timeliness

Defining a restoration program and gaining financial support for its implementation takes time and resources typically not found in this management element. As grant programs begin to fund such activities, review and permitting should be expedited.

Political Acceptability, Local and Regional

In general, there is support for implementing ecosystem restoration programs that target conservation and preservation of natural lands for purposes of improving water resources and threatened and endangered species.

Adapting to Climate Change

[Add text]

Statewide Management Objective: Practice Resources Stewardship

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for ecosystem restoration measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Begin placing a monetary benefit value to ecosystem restoration activities using cost benefit analysis of not having to store, treat and convey a quantified amount of water supplies because of improved natural systems.
- Introduce the concept of avoided cost of nature providing natural flood attenuation and sediment control.
- Conduct needed monitoring, and feasibility and environmental studies to support the implementation of ecosystem restoration measures.
- Seek state and federal grant funding to support public education and practices aimed at restoration practices.
- Seek to identify ecosystems restoration and enhancement opportunities that could be integrated into proposed IWRMP projects.

Additional Recommendations:

Forest Management

Definitions:

Forest Management is intended to understand and maximize the water produced through the conservation and management of forest lands.

State RMS Definition:

> *Forest management activities can affect water quantity and quality. The strategy…focuses on forest management activities, on both publicly and privately owned forest lands, whose goals specifically include improvement of the availability and quality of water for downstream users. (DWR, 2013)*

RMS is not considered for meeting IRWM Goals and Objectives:

Forest management is closely related to Ecosystem Restoration and Recharge Area Protection strategies and is considered to be included within the recommendations of both strategies.

Comments:

Land Use Planning and Management

Definitions:

Land Use Planning and Management is linked with many of the management strategies within watershed planning, water use efficiency, flood management, climate change, and resources stewardship.

Integrating land use and water management consists of planning for the housing and economic development needs of a growing population, while providing for the efficient use of water, water quality, energy, and other resources.

State RMS Definition of Land Use:

> *Stronger collaboration between land use planners and water managers can promote more efficient and effective land use patterns and greater integration of regional water management (IRWM), which can produce safer and more resilient communities. (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Land use planning is included in multiple IRWM Plan Objectives related to watershed, water management, groundwater management, and low impact development plans. Specific Objectives include:

- Develop Water Management Plans that achieve sustainability with existing and foreseeable development
- Develop a plan for climate change and the associated impacts of droughts and flooding on urban and agricultural developed areas
- Introduce watershed enhancement programs to maintain, or increase, water supplies with changes in land use over time
- Promote low impact development and other land use practices aimed at reducing flooding and protecting water supplies

- Integrate water resources infrastructure into land use planning for flood control and improved water supplies
- Consider protecting existing water rights (quantity and quality) in land use planning so as not to degrade or reduce legally protected water supplies

Complexity

Land use planning is a long-term commitment requiring a dedicated program to continuously incorporate features for the protection of water supplies and reduction in flooding.

Resolve Conflicts

Pressure from environmental interests over concerns with new development will be reduced by implementation of smarter land use planning targeting the protection of water resources.

Regional Benefits

Land use management provides secondary regional benefits to improved water quality for both surface water and groundwater.

Timeliness

The implementation of various water and land use related plans is typically measured in decades. Through monitoring programs set up as part of continuous growth and change, land use planning actions can be measured over time to understand the full benefits of long-term program implementation.

Political Acceptability, Local and Regional

In general, there is support for implementing eco-friendly land use plans that target improving quality of life.

Adapting to Climate Change

California has established a series of environmental goals (e.g., the Renewable Portfolio Standard and the greenhouse gas emission reduction goals) ***for communities to adopt in their individual land use planning actions***, including efforts to reduce greenhouse gas emissions, develop a clean

economy, and provide clean air and water for all residents

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for land use planning and management?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Strive to have local planning agencies work alongside water agencies as watershed, water management, flood management, and groundwater management plans are developed and implemented
- Continue to involve agriculture and rural stakeholders in the land use planning process
- Protect natural groundwater recharge areas by incorporating conservation easements over lands which contribute to the recharge of existing groundwater supplies

Additional Recommendations:

Recharge Area Protection

Definitions:

Recharge Area Protection increases the sustainable yield of groundwater from the benefitting basins.

Protection of recharge areas is necessary if the quantity and quality of groundwater in the aquifer are to be maintained.

State RMS Definition:

> *Recharge areas are those areas that provide the primary means of replenishing groundwater. Good natural recharge areas are those where good quality surface water is able to percolate through the sediments and rocks to the saturated zone, which contains groundwater. (DWR, 2013)*

RMS is not considered for meeting IRWM Goals and Objectives:

The Recharge Area Protection strategy does not play a critical role in the SLO Region IRWM Plan and is considered to be included under multiple strategies including pollution prevention, ecosystem restoration and land use planning.

Comments:

Sediment Management

Definitions:

Sediment Management is the understanding, on watershed by watershed basis, the benefits and impacts of erosion of native soils or manmade materials.

Regional sediment management is the effort to use sediments most beneficially throughout the the watershed.

State RMS Definition:

> *Sediment management is an essential for integrated water management as the presence or absence of sediment will have significant impacts on water and its beneficial uses. (DWR, 2013)*

RMS is not considered for meeting IRWM Goals and Objectives:

Sediment control strategies are not considered as an issue in the IRWM Plan beyond the programs in place to reduce sediments from manmade actions such as new construction or urban runoff. While deemed to be important, the watershed-level understanding of benefits and impacts of sediments is not available.

Comments:

Watershed Management

Definitions:

The watershed unit is the optimal boundary for managing the watershed's ability to provide for the needs of the community, both natural and manmade.

Watershed Management can range from maintenance to restoration of a watershed's natural resources.

State RMS Definition of Watershed Management:

> *Watershed management is the process of creating and implementing plans, programs, projects, and activities to restore, sustain, and enhance watershed functions. (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Need to understand the Watershed Studies and if they fit here?

Complexity

[add text here]

Resolve Conflicts

[add text here]

Regional Benefits

[add text here]

Timeliness

[add text here]

Political Acceptability, Local and Regional

[add text here]

Adapting to Climate Change

[add text here]

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for land use planning and management?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

-

Additional Recommendations:

STATEWIDE MANAGEMENT STRATEGIES TO IMPROVE FLOOD MANAGEMENT

Flood Management

Definitions:

Flood Management is the ability to predict and control the movement of flood waters at varying degrees of intensity.

Flooding damage occurs when hydrologic conditions are not planned for or if the infrastructure fails to perform as designed.

State RMS Definition of Flood Management:

Flood management consists of three primary activities:

1. *Managing flood risk — keeping floodwater away from people and property*
2. *Managing floodplain resources — keeping people and assets out of the path of floodwater*
3. *Managing floodplain functions — sustaining the natural function of floodplains including creating habitats, attenuating flows, and sediment transport*

(DWR, 2013)

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Flood Management strategies are a primary goal of the IRWM Plan as follows:

Foster an integrated, watershed approach to flood management and improved stormwater quality through collaborative community supported processes in order to ensure community health, safety and to enhance quality of life.

Objectives include:

- Understand Flood Management needs in the community
- Promote Low Impact Development to reduce runoff and protect against property damage
- Enhance natural groundwater recharge through deliberate ponding and detention of flood flows in areas of conducive to high recharge rates
- Improve infrastructure and operations to reduce flooding in downstream communities
- Implement multiple benefit projects to achieve the highest and best use of flood projects
- Restore streams, rivers and floodplains to allow the natural flood paths to attenuate peak flood flows
- Support DAC flood protection

Complexity

Flood management requires a concerted effort between multiple land use agencies and the flood control district, making project and operations implementation challenging. Level of acceptable flood risk and apportionment of flood control/operations benefits requires continuous community outreach, especially in cases where a DAC is at risk of flooding.

Resolve Conflicts

Regional flood control and management provides the highest level of flexibility in reducing conflicts associated with an upstream community changing the flooding frequency through land use and development actions.

Regional Benefits

Large flood control projects can serve multiple communities crossing over political boundaries as the waterways move towards the ocean. Upstream actions can benefit multiple downstream agencies.

Timeliness

Statewide Management Objective: Improve Flood Management

Flood management is and has been in place for ___ years in SLO County. Larger projects requiring funding have been designated and are to be included in the most current list of IRWM projects.

Political Acceptability, Local and Regional

Regional benefits and decreased probability of loss of life and property typically gains support but not urgency. Wet years and experienced flood events often change this sentiment.

Adapting to Climate Change

Flood management is a critical strategy for the SLO Region to safely adapt to climate change. This is done through studies of how weather patterns will change and in some cases require the upsizing of large infrastructure projects. Flood control operations can be refined as more is understood about the effects of climate change.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for ecosystem restoration measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Continue to protect against loss of life and property through flood management actions by the Flood Control District.

- Stakeholder assessments and a DAC needs analysis are needed to document localized stormwater and runoff issues and bring about an awareness of the need for regional solutions.
- Development of regional, integrated stormwater management projects that provide multiple benefits.
- Flood Management projects to endorse include:
    - Total storage approach to providing flood protection.
    - Regional detention/retention ponds which have multiple beneficial uses, instead of development-specific detention ponds.
    - Improvements to local drains to store additional flow from increased urban runoff.
- Utilization of specific plan areas to work with developers to produce drainage master plans.

Additional Recommendations:

Statewide Management Objective: Reduce Water Demand

STATEWIDE MANAGEMENT STRATEGIES TO REDUCE WATER DEMAND

- Agricultural Water Use Efficiency
- Urban Water Use Efficiency

Agricultural Water Use Efficiency

Definitions:

Water use efficiency in any application or use is the scientific understanding of the true water demand to sustain the beneficial use for which it is intended.

Agricultural Water Use Efficiency strategies are intended to educate and bring awareness to the agricultural community on what are the optimum water requirements for the crops irrigated or livestock managed.

State RMS Definition of Water Conservation:

> *…the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water (CWC Section10817). (DWR, 2013)*

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Water use efficiency programs are stated as Objectives in the IRWM Plan. For agriculture, programs already in place are providing the benefit of reduced strain on the regional groundwater basin. Additional education, conservation and use of technology are needed to achieve additional benefits. The benefits, in addition to water savings, may include water quality improvements, environmental benefits, improved flow and timing, and often increased energy efficiency. The IRWM Plan Objectives are as follows:

- Support sustainable water supplies for agriculture
- Develop and implement conservation programs to increase water use efficiencies in all water

use sectors

Complexity

Water use efficiency programs need to be directed to each agricultural water use sector (i.e., row crops, orchards, vineyards, etc.) individually, integrated as part of an Agricultural Water Management Plan, if possible, with education of the best management practices, and hardened measures such as the implementation of cost-effective technologies sized and based on the product being grown. Given the complex factors affecting agricultural productivity, economic benefits can only be used as a gauge and can in no means be exclusively linked to the efficiency of water use.

Resolve Conflicts

Competitiveness between urban and agriculture uses sharing the same source of supply continues to be heated. To reduce this ongoing conflict, a regional Water Use Efficiency program is needed to consider both urban and agricultural measures that produce the highest overall benefit for the SLO Region. This requires one use sector to subsidize another based on the allocation of benefits received (e.g., urban pays for agricultural drip irrigation).

Regional Benefits

Given the regional nature of implementing any water use efficiency program, regional benefits are a likely outcome of this strategy. Economic incentives and funding sources would likely come from a regional-scale project to educate and implement specific water conservation measures.

Timeliness

Existing programs need to be evaluated for their effectiveness and identify where improvements can be made over a continuous 5-year horizon. State law (SBX7-7) requires agricultural water suppliers to prepare plans and implement efficient water management practices. Given SLO Region's unorganized agricultural sector, this requirement does not apply to individual growers unless funding has been provided.

Political Acceptability, Local and Regional

Water conservation is often thought of as a penalty, or, in some cases, as a means to take away existing water rights and reduce their dry year supplies. Acceptability amongst the agricultural community will need to take place prior to rolling out any project or program suggested as part of

the IRWM Plan.

Adapting to Climate Change

On-farm water use efficiency improvements often require additional energy. Water use efficiency efforts not only increase energy use, but also often shift use of energy and resources to other parts of the production system. Within the agricultural setting, the net impact of reduced water use and increased water use efficiency on the energy use and consequently on net carbon footprint, water footprint, and greenhouse gas emissions calls for study and quantification of such impacts.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for agricultural water use efficiency measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Agricultural growers should be encouraged to organize to become eligible for statewide incentive programs, and to take the lead in submitting IRWM projects for purposes of grant funding.
- Studies should be conducted to understand the benefits of subsidizing agricultural water use efficiency measures to use the conserved water for purposes of increased reliability in urban water sectors.

- Measures should be taken to ensure a grower's freedom in making the decision of what to grow.

Additional Recommendations:

Urban Water Use Efficiency

Definitions:

Water use efficiency in any application or use is the scientific understanding of the true water demand to sustain the beneficial use for which it is intended.

Urban demand management, or water use efficiency, is important to lowering water demands to help stretch existing water supplies in dry conditions and, if permanent reductions in demand, to support new growth.

State RMS Definition:

Using water efficiently yields multiple benefits, including:

- *Increased reliability of water supplies*
- *Improved capacity to meet the increasing water demand of California's growing population*
- *Delayed capital costs for new infrastructure to treat and deliver water*
- *Reduction in contaminated irrigation runoff to surface waters*
- *Reduced volume of wastewater, thus reducing capital costs and ongoing treatment costs*
- *Increased availability of water for surface or groundwater storage in wet years*
- *Reduced water-related energy demands and associated greenhouse gas emissions*
- *Reduced diversions from the Bay-Delta*

(DWR, 2013)

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

Water use efficiency programs are stated as Objectives in the IRWM Plan. For urban users living in California and the SLO Region, water conservation has been a part of their lives giving thought to not

wasting water for the environment to reducing their water bill. As the cost for raw water continues to increase, continued implementation of new conservation measures is an effective means of keeping the customer's costs relatively stable.

The IRWM Plan Objectives are as follows:

- Support sustainable water supplies in all communities
- Develop and implement conservation programs to increase water use efficiencies in all water use sectors

Complexity

Constraints to implementing water conservation measures include the administrative costs to develop and implement programs since many communities have lower incomes or are disadvantaged; lack of financial incentives to support program implementation; relatively low cost of groundwater; and program costs or rates.

Resolve Conflicts

To maintain fairness, urban water use efficiency measures should be undertaken to ensure that urban users are reasonably and beneficially using the water; that urban users are being held to the same high standards as agriculture; and that all practical conservation measures are being implemented.

Regional Benefits

The IRWM Plan can help to define regional opportunities to cost effectively support programs to implement water conservation measures and regional opportunities to comply with requirements.

Timeliness

Implementation of conservation programs is a continuous process with goals set by the state through SBX7-7 to show a 20% reduction in water use by 2020. The 20 X 2020 law has accelerated conservation programs throughout the state, helping to reduce the need for local efforts in public education due to economies of scale.

Political Acceptability, Local and Regional

Conservation programs require political acceptability for changing lifestyles (or how water is used), and a general resistance to making investments in water savings so that future growth can be supported. There is also the concern that conservation would reduce the community's ability to respond to a drought or shortage year, resulting in unnecessary hardships imposed on the community.

Adapting to Climate Change

Urban Water Use Efficiency enables local agencies to both adapt to increased dryness and to mitigate greenhouse gas emissions by reducing water and energy use. Improving water use efficiency is a mitigation strategy to climate change because of the relationship between greenhouse gas emissions and the use of fossil fuels that create the energy required to produce, convey, treat, and distribute water. This required energy varies from community to community, depending on local circumstances. Increasing water use efficiency serves as a way to mitigate and adapt to climate change.

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for urban water use efficiency measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

- Cities should coordinate the 2010 Urban Water Management Plan (UWMP) updates:
- Define urban water conservation regional funding mechanisms and approach
- Develop a Regional UWMP (near-term action)
- Develop drought management/contingency and catastrophic supply interruption plans
- Implement a water conservation public information and outreach campaign
- Review and track progress in implementing measures and implementing local or a regional 2010 UWMP
- Prepare an annual report to document regional progress
- Cities should target future water uses, emphasizing development of standards that would minimize future water demands and ensure measurable savings when agricultural land is converted to urban uses consistent with existing land use plans
- Streamline the development review and permitting process and ensure that water conservation practices are implemented at the time of project development and approval

Additional Recommendations:

STATEWIDE MANAGEMENT STRATEGIES TO IMPROVE OPERATIONAL EFFICIENCY AND TRANSFERS

- Conveyance – Delta
- Conveyance – Regional/Local
- System Reoperation
- Water Transfers

Conveyance – Delta

Definitions:

[add text here]

State RMS Definition of Conveyance in the Delta:

[Add state definition of conveyance in the Delta here]. (DWR, 2013)

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

[add text here]

Complexity

[add text here]

Resolve Conflicts

[add text here]

Regional Benefits

[add text here]

Timeliness

[add text here]

Political Acceptability, Local and Regional

[add text here]

Adapting to Climate Change

[add text here]

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for ecosystem restoration measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

-

Additional Recommendations:

[add text here]

Conveyance – Regional/Local

Definitions:

Conveyance provides for movement of water and includes natural water courses and infrastructure like canals, pipelines, diversion structures. Local conveyance includes the locally owned and managed conveyance infrastructure such as the large pipelines used to deliver wholesale raw and treated water and smaller pipelines that convey treated water to retail customers.

State RMS Definition of Regional/Local Conveyance:

[Add state definition of regional/local conveyance here]. (DWR, 2013)

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

[add text here]

Complexity

[add text here]

Resolve Conflicts

[add text here]

Regional Benefits

[add text here]

Timeliness

[add text here]

Political Acceptability, Local and Regional

[add text here]

Adapting to Climate Change

Statewide Management Objective: Improve Operational Efficiency and Transfers

[add text here]

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for ecosystem restoration measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

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Additional Recommendations:

System Reoperation

Definitions:

[add text here]

State RMS Definition of System Reoperation:

[Add state definition of system reoperation here]. (DWR, 2013)

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

[add text here]

Complexity

[add text here]

Resolve Conflicts

[add text here]

Regional Benefits

[add text here]

Timeliness

[add text here]

Political Acceptability, Local and Regional

[add text here]

Adapting to Climate Change

[add text here]

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for ecosystem restoration measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

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Additional Recommendations:

Water Transfers

Definitions:

[add text here]

State RMS Definition of Water Transfers:

[Add state definition of water transfers here]. (DWR, 2013)

SLO Region IRWM Plan Screening Criteria:

SLO Region IRWM Plan Goals and Objectives

[add text here]

Complexity

[add text here]

Resolve Conflicts

[add text here]

Regional Benefits

[add text here]

Timeliness

[add text here]

Political Acceptability, Local and Regional

[add text here]

Adapting to Climate Change

[add text here]

Sub-Region Stakeholder's Findings

When you think about the above screening criteria, what elements of your Sub-Region satisfy the criteria? Especially, respond to the following questions:

What are the opportunities (or needs) for ecosystem restoration measures?

Recommendations:

What are your recommendations for including this RMS in the SLO Region IRWM Plan? The suggestions below are based on previous studies and from the 2007 IRWM Plan. Please circle those that you align with and provide additional recommendations, if needed.

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Additional Recommendations: