SAN LUIS OBISPO COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT (SLOCFCWD)

PASO BASIN GROUNDWATER BASIN SUPPLEMENTAL SUPPLY OPTIONS STUDY

TECHNICAL MEMORANDUM NO. 4 RECYCLED WATER SUPPLY OPTIONS AND POINTS OF DELIVERY

FINAL
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RECYCLED WATER SUPPLY OPTIONS AND POINTS OF DELIVERY

This technical memorandum (TM) was originally release to the public in June 2015. It has been was used to inform the Supply Options Team and the San Luis Obispo County Flood Control and Water Conservation District (District, SLOCFCWCD) about availability and use of Recycled Water (RW) for the Paso Robles Groundwater Basin (Paso Basin). Since the TM was originally developed, ongoing drought conditions have caused local purveyors to look for opportunities to improve their water supply portfolios. The City of Paso Robles has continued developing their RW Program. They have not yet determined the rates they would charge for RW. The City has also indicated that they do not intend to blend with Nacimiento water for in-City uses, although their 2014 Recycled Water Master Plan details the benefits of blending for agricultural reuse. The most updated information can be found in the Paso Robles Groundwater Basin Supplemental Supply Options Feasibility Study.

1.0 PURPOSE

This TM is one of three TMs evaluating supply options in the Paso Basin as part of the Paso Basin Supplemental Water Supply Options Study. The three supply options are: 1) Nacimiento Project Water (TM No. 2); State Water Project (SWP) Water (TM No. 3); and Recycled Water (TM No. 4). The goal of the Supply Options Study is to determine the quantity, quality, cost, and points of transfer of supplemental water options, infrastructure needs at transfer points, and the terms and/or conditions under which a Paso Basin entity[1] could procure it (e.g., contractual issues/negotiations/"transfer terms").

The purpose of this TM is to identify potential recycled water opportunities to maximize its use to benefit the Paso Basin. The following is addressed in the TM:

- Review of existing recycled water planning documents.
- Review of relationship between water rights and recycled water.
- Identify existing and planned recycled water projects in terms of type and volume of use, identify any remaining available recycled water volumes, and identify location of the planned and potential uses, available recycled water, and potential points of delivery.
- Identify any issues to implementing potential new supplies including regulatory, contractual, environmental, financial, timing, and public/institutional acceptance.

[1] Paso Basin entities are the target audience for this study, and these entities could be, but are not limited to, the ultimate Groundwater Sustainability Agency or Agencies responsible for meeting the requirements of the Sustainable Groundwater Management Act, a Paso Basin Water District, community water system decision makers, individuals within the Basin or any combination thereof.

This TM will evaluate potential options for increasing recycled water use and identify the primary potential end uses of the water for each. The primary goal of increased use of recycled water is to help stabilize and potentially recover groundwater levels in the basin over time. Although the evaluation of the specific end uses within the Paso Basin is beyond the scope of this TM, it is anticipated that the computer model for the basin will be used to quantify the amount of water needed over time to stabilize levels in various parts of the basin. This information can then be used in the next phase of work to compare the proximity of, and quantity and quality of the water available at, each transfer point to develop strategies to achieve the highest benefit. The purpose of the evaluation of options in this TM is to identify which options associated with the use of recycled water should be evaluated in the next phase and which should be deferred in accordance with specific criteria.

The Paso Basin Supply Options Subcommittee and other stakeholders will be able to provide input and comment to the draft TM. A town hall style public meeting will be held to solicit comments and input prior to moving into the next phase of work. During the next phase, additional details will be developed as needed, including further discussions and investigations into contractual, institutional, and environmental issues. Proposed strategies will be compared and ranked resulting in a prioritized list and recommended plan for the procurement of preferred supplemental water supplies. The results of the next phase will then be summarized into a report that will be distributed to the public for comment and eventually be presented to the County Board of Supervisors.

2.0 SUMMARY OF FINDINGS/RECOMMENDATIONS

The major findings of this TM are as follows:

- In general, the recycled water supplies in the basin are already contributing to the overall basin water balance, but could contribute more directly if used as in lieu supply in the area of sharpest pumping level decline.
- Each wastewater treatment plant currently treats effluent to secondary levels[2] and requires an upgrade to tertiary filtration[3] to implement any recycled water project. The City of Paso Robles is underway with design of such tertiary facilities. Additional treatment beyond tertiary[4] may be required to meet customer or regulatory requirements.
- The capital investments required for an extensive recycled water distribution system can make recycled water expensive. However, there is significant funding available

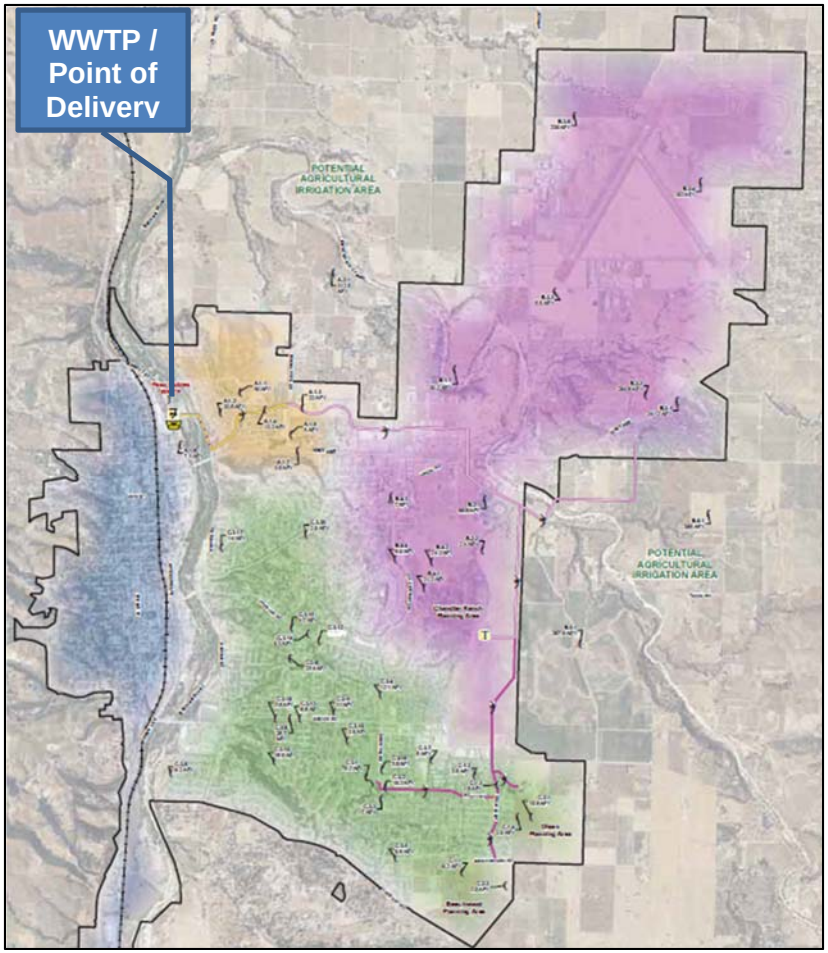
[2] Biological treatment to remove biodegradable organic matter and suspended solids.
[3] Filtration for further removal of biodegradable organic matter and suspended solids for unrestricted non-potable use.
[4] For example, reverse osmosis (RO) membranes are used remove dissolved solids, such as salt, for customer-specific needs. Treatment for groundwater recharge may include RO and advanced oxidation for removal of salt, organics, and emerging constituents of concern.

for recycled water programs to meet the State of California's goal for additional recycling.

- Higher volume recycled water supplies and demands can make a recycled water system more cost effective. So focusing on recycled water use from the City of Paso Robles may make the most sense. In particular, agricultural irrigation and groundwater recharge in locations with the most severe overdraft provide the best reuse opportunities.
- The best opportunity for reuse, using recycled water from Paso Robles for beneficial use outside of the City, will require regional cooperation to implement.

The option found most viable and recommended to be further evaluated is summarized on the following page in a one-page fact sheet. More detailed consideration of other options is included in the following sections.

RW-1: Paso Robles Recycled Water Delivery



Source: *Paso Robles Recycled Water Master Plan, Plate 3: Recommended Capital Improvements*. Colors represent service areas considered in the plan.
Note: Does not include infrastructure for service to northern and eastern agricultural irrigation areas or to potential recharge areas.

Background/Source of Supply:

Wastewater treated at the Paso Robles WWTP is currently discharged into the Salinas River. Tertiary filtration would be required for unrestricted reuse and is currently in the pre-design phase.

Potential Yield: **3,300 to 5,370 (buildout) AFY**

Level of Treatment/Water Quality: **Secondary treated effluent; High in salinity.** Paso Robles wastewater treatment plant is undergoing a $48 million upgrade now. The City's master plan for recycled water envisions supplementing deep well irrigation with recycled water as a blending approach to reduce salinity. Further, the wastewater treatment plant is situated such that surplus Nacimiento Project water could also be conveyed in the proposed recycled water delivery system, offering another means of blending to create adequate quality water. For example, a 50/50 blend would result in a total dissolved solids concentration of approximately 500 to 600 mg/L.

Point of Delivery: Paso Robles WWTP: 3200 Sulphur Springs Road

Suitable End Uses: **River discharge (existing use), Irrigation (Municipal or Agricultural), Groundwater recharge, fire protection**

Cost Component Considerations:

Capital: $6-46 Million for Stages 1-3 (identified in Recycled Water MP)

- Tertiary filtration (Title 22)
- Pipeline to end users
- Blend water purchase and infrastructure (not included in cost estimate)
- On-site retrofit or recharge facilities (depending on end use) (not included in costs estimate)

Operations & Maintenance:

- Treatment Costs (labor, chemicals, energy, replacement costs)
- Conveyance Costs (labor, energy, replacement costs)

Implementation Issues:

Institutional: City as project lead with delivery agreements with recycled water customers.
Contractual: Customer delivery agreements between City and end users.
Reliant on completion of other project: No, but combining with surplus untreated Nacimiento water, which would require separate contractual arrangements, would reduce salinity and allow for greater economies of scale for new facilities.
Key Partner(s) interest: Several agricultural representatives expressed interest in the use of recycled water.
Public acceptance/opposition: unknown at this time [since the public hasn't been "polled"].

Implementation Duration/Timeline:

Permanent – Significant investment of infrastructure would support long-term supplemental supply as opposed to temporary use of water.
Short-Term (0-5 Years): At least three years to plan, design and construct system once customers commit to reuse and a decision is made to proceed.

3.0 INTRODUCTION

3.1 Background

The Paso Robles Groundwater Basin (DWR subbasin no 3-4.06) is located in the upper portion of the Salinas River watershed and is the primary water source for North San Luis Obispo County. The basin is approximately 505,000 acres (790 square miles), approximately 20 percent of which extends into Monterey County, and all the communities within the basin rely to some degree on the basin's groundwater. Rural residences, urban development, vineyards, and other agricultural uses all pump water from the underground basin to use for potable and non-potable uses.

The San Luis Obispo County Flood Control and Water Conservation District (District) has spent several years studying the basin hydrogeology and the demand and supply of the basin's groundwater. The various studies have concluded that that the groundwater basin is approaching or has reached its perennial yield. The 2014 Basin Computer Model Update has estimated that from 1981 to 2011 annual outflows exceed the inflows of the basin by 2,400 AFY. These exceedances have manifested in groundwater level declines and are depicted in Figure 4.1 for the period 1997-2013. This imbalance is further aggravated under future year simulations, highlighting the need to identify supply alternatives to offset further pumping of the basin groundwater.

3.2 Recycled Water Setting

There are four[5] significant wastewater treatment plants (WWTP) within the Paso Robles Groundwater Basin as shown in Figure 4.2 and summarized in Table 4.1. The WWTPs currently discharge directly into the Salinas River or to percolation ponds adjacent to the Salinas River.

Each WWTP discharges either directly into the Salinas River or indirectly to the river underflow via percolation ponds. Currently, there is no direct use of treated wastewater (i.e., recycled water) in the basin. Discharge of treated wastewater effluent to the Salinas River underflow is a component of the basin water balance and percolation of some of this water to the Paso Robles Formation likely occurs. Consequently, reuse of discharges may not have a 1:1 new water supply benefit. Even without full new water supply benefits, direct or in-lieu recharge outside of the Salinas River helps to address the area with the most severe groundwater level decline.

[5] Camp Roberts, which is downstream (north) of San Miguel, operates the Main Garrison WWTP.

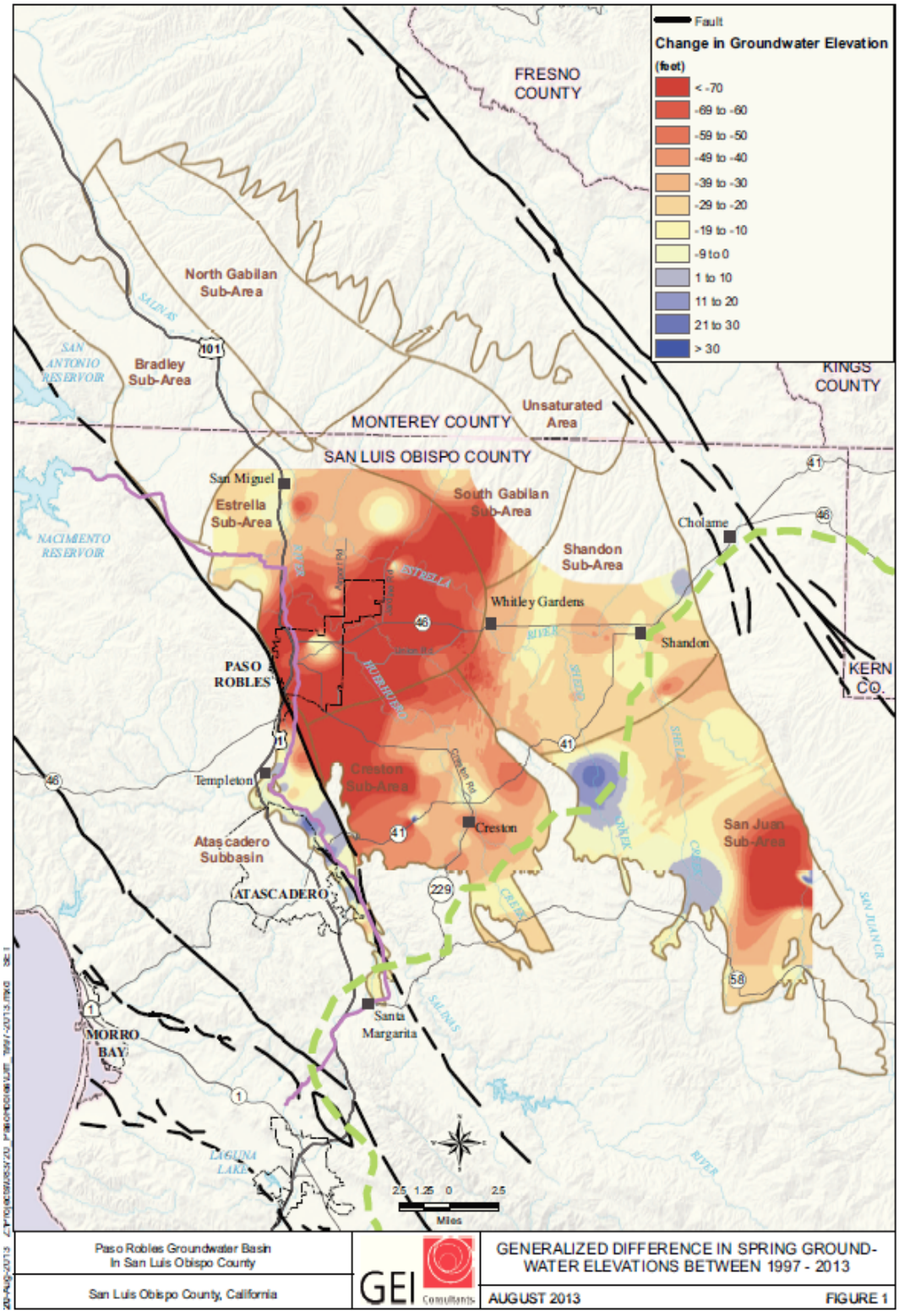


Figure 4.1 Generalized Difference in Spring Groundwater Elevations between 1997-2013

Existing WWTP ExistingFlows
Atascadero 1.1 mgd
Paso Robles 3.0 mgd
San Miguel 0.11 mgd
Templeton 0.15 mgd
Nacimiento Lake
San Miguel WWTP
San Miguel
Estrella River
Salinas River
Shandon WWTP Proposed
46
Paso Robles WWTP
Paso Robles
Huerhuero Creek
Nacimiento
Atascadero/Templeton
Salinas/Estrella
Cambria
Templeton
Templeton CSD WWTP
Atascadero
Atascadero WWTP
Cayucos
Lake Atascadero
101
Figure 4.2
Wastewater Treatment Plants within the Basin
Paso Basin Supplemental Water Supply Options
N
0 1 2 4 Miles
Sources: Esri, San Luis Obispo County
Existing WWTP
Proposed WWTP
Groundwater Basins
Main Basin
Atascadero Sub-Basin
Estrella Sub-Basin
Filepath: L:\Projects GIS\Paso Robles\MXD\Figure 4.1

Table 4.1 Wastewater Effluent Flows in the Basin
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

WRF	Level of Treatment	Existing	Projected Buildout
WWTP Effluent Discharges			
Atascadero[(1)]	Secondary	1.1 mgd (1,230 afy)	1.1 mgd (1,230 afy)
Paso Robles[(2)]	Advanced Secondary	3.0 mgd (3,350 afy)	4.9 mgd (5,370 afy)
San Miguel[(3)]	Secondary	0.11 mgd (120 afy)	0.25 mgd (280 afy)
Templeton[(4)]	Secondary	0.15 mgd (170 afy)	0.40 mgd (450 afy)
Effluent Subtotal		**4.36 mgd (4,875 afy)**	**6.65 mgd (7,435 afy)**

Notes:
(1) Source: Paso Robles Groundwater Basin Water Balance Review and Update (Fugro, 2010); Table 17.
(2) Source: Paso Robles Recycled Water Master Plan (AECOM, 2014). "Advanced Secondary" includes nutrient removal in addition to traditional secondary treatment.
(3) Source: Personal communication (e-mail dated 08/15/2014) with Steve Tanaka, San Miguel CSD Engineer, Wallace Group.
(4) Source: 2013 Water and Wastewater Master Plan Update (TCSD, 2013). In addition, approximately 0.22 mgd (240 afy) of existing flow currently flows to Paso Robles WWTP. This flow is projected to increase to 0.27 mgd (300 afy). TCSD plans to divert this flow to their existing WWTP. Paso Robles WWTP flows would be reduced by a similar amount. Refer to Section 4.1.3 for further discussion.

In addition, the Rinconada fault exists between the Atascadero Sub-Basin and the main Paso Robles Groundwater Basin (Basin Model Update 9/9/14, Section 2.4, Footnote 7). As a result, increased water discharges / recharge within the Atascadero Sub-Basin may not have full benefits to other parts of the basin.

Direct discharge of treated wastewater effluent to the Salinas River is highly regulated and communities spend millions of dollars to comply with discharge requirements. Regulatory trends are such that dischargers are discouraged from continued surface water discharges and recycled water is encouraged through State funding programs. The benefits of supplementing irrigation with recycled water as compared to impacts of changes in discharge practices must be considered.

3.3 Previously Identified Options

As part of implementing the Paso Robles Groundwater Basin Management Plan, a Blue Ribbon Steering Committee (BRC) was formed to provide input into the potential "solutions" for the declining groundwater level problem. The outcome of this effort was a list of Top Ranked Solutions in August 2013. The solutions were divided into categories of

management, conservation, supplemental and recycling alternatives. In addition, the solutions were categorized as short, medium, and long-term solutions.

One recycled water option was included in the top ranked solutions and is presented in Table 4.2.

Table 4.2 Summary of Relevant Top Ranked Solutions from BRC, Aug. 2013 Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District

Category	Timeline	Option	Description
Recycling	Med/Long Term	MLT - 8	Incentive onsite reuse/grey water systems

Notes:
(1) From Blue Ribbon Steering Committee Top Ranked Solutions, Aug 21, 2013.

MLT–8 is outside the scope of this study because it is a management option that would require ordinances and incentives to encourage home and land-owners to capture onsite grey and rain water that could be reused to offset potable or groundwater supplies for activities like landscape irrigation.

3.4 Options Considered in Kickoff Meeting

During the Supply Options Study kickoff meeting in May 2014, the Supply Options Team, District staff, and City of Paso Robles representatives brainstormed options that would benefit the Paso Basin. Only those relevant to the scope of this study are shown herein. This list is a starting point for the list of options to be evaluated and incorporated into the study. The list of recycled water options discussed at the kickoff meeting is summarized in Table 4.3 along with how the option will be incorporated into the study. Because this study focuses on supply options and not end uses, the exact user of recycled water supplies will not be determined in this TM. Discussion of end users is important for identifying potential water quality needs and resulting levels of treatment required.

Options were evaluated as to their timeline for implementation. An assignment of short, mid or long-term implementation from design through construction was used as follows: *Short Term = 0 - 5 years, Mid-Term = 5 - 10 years, Long-Term = 10 - 15 years.*

Similarly, options were compared based on the duration of reliable water supply in terms of providing either a supply that is temporary (annual or 5 year contract) versus permanent (long term lease or contract).

Table 4.3 Summary of Recycled Water Supply Options Considered at the Kickoff Meeting [1]
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

Option	Timeline/ Duration[2]	Application to Supply Options Study [1]
Paso Robles: Optimize recycled water recharge by moving the discharge point to groundwater depression bulls eye to capture 100% of the benefit.	M/P	Use of recycled water from Paso Robles WWTP is included in the study. Location of use is not defined in this study.
Non-potable use of recycled water use in Shandon area	L/P	Option is included in the study
Blend recycled water and Nacimiento water and supply in-lieu to users	M/P	Blending of supplies is discussed in the study; however, discussion of specific customers is outside the scope of this study.
Recycled water pipeline through the Highway 46 East corridor	M/P	Use of recycled water from Paso Robles WWTP is included in the study.
Discharge recycled water into the Salinas River upstream of Paso Robles wells and/or north of the fault (within the Atascadero Sub-Basin).	M/P	Use of recycled water from Paso Robles WWTP is included in the study.
Maximize reuse from Atascadero and Templeton	M/P	Option are included in the study

Notes:
(1) End uses of recycled water not determined by this study.
(2) Timeline to implement: Short-term (S) of 0 - 5 years, Medium-Term (M) or 5 -10 years or Long-Term (L) of 10 - 15 yrs. Duration of reliable water supply: Temporary (T) or Permanent (P).

4.0 POTENTIAL RECYCLED WATER SUPPLY OPTIONS

There are two types of potential recycled water supply options explored in this study:

- Reuse from new or existing in-basin WWTPs.
- Investment in the creation or expansion of recycled water systems in the rest of the District in exchange for supplies available within the basin (i.e., Nacimiento project water or State Water Project water).

In-basin WWTPs are discussed in Section 4.1 and exchange options are discussed in Section 4.2. First, previously identified options are reviewed.

4.1 In-Basin Wastewater Treatment Plants

This section discusses potential recycled water use options from four existing WWTPs (Atascadero, Paso Robles, San Miguel and Templeton) and one potential new WWTP in the Paso Basin (Shandon). The WWTPs in the study area are summarized in Table 4.4.

Table 4.4 Potential Recycled Water Supply Options under Current Conditions Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District

WWTP	Existing Effluent [1]	Existing Use of Effluent	Additional Potential Reuse with Existing Flows
Atascadero [2]	1.1 mgd (1,230 afy)	0.27 mgd (300 afy)	0.8 mgd (930 afy)
Paso Robles	3.0 mgd (3,350 afy)	--	3.0 mgd (3,350 afy)
San Miguel	0.11 mgd (120 afy)	--	0.11 mgd (120 afy)
Templeton [3]	0.15 mgd (170 afy)	0.15 mgd (170 afy)	0.15 mgd (170 afy)
Subtotal	**4.36 mgd (4,875 afy)**	**0.42 mgd (470 afy)**	**3.94 mgd (4,405 afy)**
Shandon [4]	0.50 mgd (560 afy)		
Total	**4.86 mgd (5,435 afy)**		

Notes:

(1) Refer to Table 4.1 for sources for effluent and use estimates.
(2) Chalk Mountain Golf Course pumps groundwater containing the percolated effluent for fairway irrigation. The remaining effluent recharges the Salinas River underflow.
(3) TCSD retrieves treated wastewater from its WWTP through percolating the treated effluent into the Selby percolation ponds for subsequent retrieval using its River underflow wells.
(4) Assumes a new WWTP is constructed and a majority of residences and businesses are connected to a collection system (Shandon Community Plan, 2012).

4.1.1 Atascadero

The Atascadero Water Reclamation Facility (WRF) is owned and operated by the City of Atascadero. The Atascadero Mutual Water Company provides potable water services. The WRF design flow is 2.4 mgd (approximately 2,700 afy). Approximately 1.1 mgd (1,230 afy) of treated effluent is discharged annually to percolation ponds (Fugro, 2010). Chalk Mountain Golf Course pumps groundwater containing the percolated effluent for fairway irrigation. Existing use by the golf course is estimated as 300 afy. The remaining effluent recharges the Salinas River underflow.

The Atascadero WRF would require upgrades to tertiary filtration for most reuse options and may require blending with other water sources or demineralization to meet customer water quality needs.

4.1.2 Paso Robles

The Paso Robles WWTP is currently being upgraded to provide disinfected secondary effluent with nutrient removal. Implementing reuse options will require an upgrade to tertiary treatment and this future upgrade was considered during design of the existing upgrade.

Paso Robles completed a Recycled Water Master Plan (RWMP) in March 2014 (AECOM), however recycled water planning efforts for the City continue to evolve. The plan evaluated non-potable reuse and indirect potable reuse (groundwater recharge) options within the City and outside of the City. The plan identified 3,631 afy of potential non-potable reuse comprised of landscape irrigation, agricultural irrigation, and urban non-irrigation demands. The refined market is summarized is shown in Table 4.5.

Table 4.5 Non-Potable Reuse Market from Paso Robles Recycled Water Master Plan Recommended Project
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

	Average Annual Demand	Maximum Month Demand	
Supply			
	Existing: 3,350 afy Buildout: 5,370 afy	Existing: 3.0 mgd Buildout: 4.9 mgd	
Non-Potable Reuse Within City Limits			
City Customers	475 afy	0.91 mgd	2.8 afd
Private Wells(1)	1,048 afy	2.02 mgd	6.2 afd
Subtotal	**1,523 afy**	**2.93 mgd**	**9 afd**
Agricultural Irrigation (Outside City)			
Vina Robles	268 afy	0.79 mgd	2.4 afd
Eastern	313 afy	0.64 mgd	2.0 afd
Northern	385 afy	0.55 mgd	1.7 afd
Subtotal	**965 afy**	**1.97 mgd**	**6.1 afd**
Total NPR & Ag	**2,488 afy**	**4.90 mgd**	**15.0 afd**

Note:
afd Acre-feet per day.
(1) Primarily includes irrigation of golf courses and agriculture irrigation.

The recommended project in the plan follows the plan's recycled water strategy:

- Focus on recycled water use opportunities in the vicinity of the WWTP and along Highway 46, in the initial phase to minimize initial distribution system costs and allow for more timely delivery of recycled water.

- Extend transmission pipeline as reuse projects are developed and funding is available.
- Extend transmission mains to areas within the City that will maximize future use opportunities and to uses outside of the City limits.

The recommended project in the plan is divided into four phases:

- WWTP: Construct tertiary treatment upgrade.
- Phase 1: Distribution system to cross the Salinas River and serve local irrigation customers with the potential to serve the northern agricultural area.
- Phase 2: Extend distribution system to the east to serve customers within City limits and the Eastern agricultural area. Extend north to the northern agricultural area.
- Phase 3: Extend south to serve both existing and new customers within City limits.

A summary of the estimated costs of each phase are shown in Table 4.6.

Table 4.6 Cost Estimates from Paso Robles Recycled Water Master Plan Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District

Phase[1]	Average Annual Demand[2]	Estimated Capital Costs[2]	Unit Capital Cost [3]
Tertiary Upgrade[4]		$19.9 M[2]	
Phase 1	114 AFY	$3.8 M	$1,400 / AF
Phase 2	2,062 AFY	$18.4 M	$400 / AF
Phase 3	305 AFY	$3.6 M	$500 / AF
Total	**2,481 AFY**	**$25.9 M**	$500 / AF

Notes:
(1) Phases are dependent on each other and must be implemented in numerical order.
(2) From the Paso Robles Recycled Water Master Plan (RWMP) (AECOM, 2014). All costs are stated in 2014 dollars at ENR CCI of 9681.11 (February 2014). Capital costs do not include distribution system beyond City limits.
(3) Based on receipt of existing SWRCB State Revolving Fund (SRF) loan of 1% interest rate over 30 years. Does not include any operation, maintenance, or replacement costs. O&M or unit costs were not included in the Paso Robles RWMP. Capital costs do not include distribution system beyond City limits.
(4) Tertiary upgrade capital costs are for 4.9 mgd, which is beyond existing flows of 3.0 mgd. The treatment will be upgraded in phases over time as WWTP flows increase.

In addition, the plan discussed groundwater recharge with recycled water at two locations:

- Upstream of the City's potable water supply wells with the intent of benefitting the yield from those wells.

- At a location east of the City with the intent of recharging the portion of the Paso Robles Groundwater Basin that is in serious water level decline (i.e. the “Estrella Area”).

The recharge sites upstream of the potable water supply wells were examined in detail with an environmental assessment and hydrogeological modeling. The sites were not recommended to be further pursued due to the limited amount of recycled water that could be recharged due to: 1) limited recharge capacity; 2) insufficient travel time during the wet season to meet regulatory requirements; and 3) lack of recycled water supply during the dry season when irrigation demands are highest.

The location east of the City is generally considered to be in the vicinity of the intersection of Highway 46 and Huer Huero Creek. The area was studied for recharge (but not necessarily with recycled water) as part of the Paso Robles Groundwater Basin Water Banking Feasibility Study (2008).

The Paso Robles RWMP notes that recharge could occur “in-lieu” via direct use of recycled water to offset groundwater pumping or directly into the basin. Recharge could be facilitated by extending “the recycled water distribution system eastward, beyond City limits, to supply irrigators and possibly to discharge to Huer Huero Creek as excess recycled water is available.” The report noted that further investigation is required to “assess the potential benefit and feasibility of groundwater recharge in the Huer Huero Creek corridor, including determining the connectivity between the Huer Huero Creek alluvium and the deeper Paso Robles Groundwater Basin.”

4.1.3 San Miguel CSD

The San Miguel CSD WWTP discharges approximately 130 afy of effluent to the Salinas River underflow (Fugro, 2010). No recycled water plans have been developed for the San Miguel CSD.

The San Miguel CSD WWTP would require upgrades to tertiary filtration for most reuse options and may require blending with other water sources or demineralization to meet customer water quality needs.

4.1.4 Shandon

Wastewater management within the community of Shandon is currently addressed by individual septic tanks with leach field systems. The community does not currently have a wastewater treatment plant; however, a plant may be needed in the future to accommodate residential and commercial development. The Shandon Community Plan (County, 2014) defined potential growth scenarios and associated utility improvements. The plan “requires a community wastewater system to be constructed with new development” but “existing development, where the land uses are not intensified, may remain on their individual septic systems and will need to be connected to that system only if certain criteria are met.”

The wastewater system is described in the plan:

- Backbone network of gravity sewer pipelines, lift stations, force mains, a wastewater treatment facility, and percolation basins.
- The preferred option is a packaged activated sludge system with nitrogen removal and disposal by percolation basins. The nitrogen removal process will provide an effluent suitable for percolation and will maximize groundwater replenishment.
- Two phases: Phase 1 = 0.5 mgd; Phase 2 / Buildout = 1.0 mgd (additional 0.5 mgd).

The plan also notes that groundwater recharge should be a priority in designing stormwater and drainage systems.

4.1.5 Templeton CSD

Templeton CSD has two wastewater tributary areas. One area (approximately 0.15 mgd or 170 afy) flows to Meadowbrook WWTP, which is owned and operated by TCSD, and the other area (approximately 0.22 mgd or 250 afy) flows to the Paso Robles WWTP under an agreement with the City of Paso Robles. Both flows eventually enter the Salinas River.

The Meadowbrook WWTP is an Advanced Integrated Pond System (AIPS), which treats the wastewater through a series of treatment ponds. The effluent is discharged into the Selby Ponds where it percolates into the underflow and is retrieved downstream by TCSD. The Paso Robles WWTP discharges approximately 3.0 mgd (3,400 afy), including 0.22 mgd (250 afy) from TCSD, directly to the Salinas River.

TCSD has State Water Resources Control Board (SWRCB) approval and is considering redirecting sewer flows currently treated at the Paso Robles WWTP to the Meadowbrook WWTP. TCSD also retains the right to capture for municipal purposes the amount of water percolated less a conveyance loss. Wastewater flow projections for TCSD are summarized in Table 4.7.

Table 4.7 Meadowbrook WWTP Flow Projections
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

Tributary Area	Existing		Projected	
Meadowbrook WWTP	0.15 mgd	170 afy	0.40 mgd	450 afy
Paso Robles WWTP (to be diverted)	0.22 mgd	240 afy	0.27 mgd	300 afy
Total	**0.37 mgd**	**410 afy**	**0.67 mgd**	**750 afy**

Note: (1) Source: 2013 Water and Wastewater Master Plan Update (TCSD, 2013).

TCSD would like to maximize effluent discharge to the Selby Ponds for percolation to the Salinas River underflow and eventual retrieval by potable water wells. Potential percolation capacity of the Selby Ponds ranges from 0.36 mgd to 0.78 mgd (HMM, 2012) depending on

recharge water quality and pond maintenance. Therefore, future effluent flows will likely exceed percolation capacity without a combination of improved effluent quality, increased pond maintenance, pond rehabilitation, and/or increased pond area.

The San Luis Obispo Regional Recycled Water Strategic Plan (SLO RRWSP) (Cannon, 2014) evaluated the potential opportunities for use of Meadowbrook WWTP effluent beyond discharge to the Selby Ponds. The report identified the potential recycled water uses for all effluent, if necessary with a combination of feed and fodder irrigation (up to 120 afy); municipal landscape irrigation (up to 76 afy); commercial landscape irrigation (p to 160 afy); agricultural / vineyard irrigation (over 300 afy); and groundwater recharge (up to 100 percent reuse via surface spreading or injection).

As shown in Table 4.8, the potential recycled water projects identified in the report had costs exceeding $2,000/af and, therefore, concluded that maximizing percolation at the Selby Ponds is the preferred use of Meadowbrook WWTP effluent. If the Selby Ponds cannot recharge all effluent, the report recommended:

- Refine feed and fodder disposal option as a temporary disposal alternative since there is a potential for reuse of up to 0.2 mgd of effluent without treatment upgrades for feed and fodder irrigation but the reuse would not offset potable water demand.
- Refine agricultural irrigation and commercial irrigation options. Survey private agricultural and large turfgrass operations in the vicinity of the WWTP for their interest in recycled water use combined with the ability for TCSD to use a similar amount of groundwater currently being used by the entity.

Table 4.8 Templeton CSD Recycled Water Options
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

Type of Reuse	Potential Demand (AFY)	Approximate Unit Cost ($/AF)	Notes
TCSD Landscape Irrigation	Up to 68 afy	Approx. $7,000/AF	Requires implementation of tertiary treatment
Commercial Landscape Irrigation	160 afy	Approx. $3,000/AF	Requires implementation of tertiary treatment
Agricultural Irrigation	Up to 260 afy	$2,000/AF to $3,000/AF	Range of costs dependent on need for demineralization
Groundwater Recharge	Up to 500 afy	$2,000/AF to $3,000/AF	Range of costs dependent on need for advanced treatment (MF/RO/AOP)

Notes: (1) Source: San Luis Obispo Regional Recycled Water Strategic Plan (Cannon, 2014).

4.2 Potential Recycled Water (Outside the Basin) Exchange Options

The recycled water exchange options are based on the premise that an entity in the Paso Basin could invest in the creation or expansion of recycled water system outside of the basin in exchange for an equitable amount of water supply from another source from the recycled water system owner. For example, a portion of the City of San Luis Obispo's Nacimiento water entitlement could be used within the Paso Basin in exchange for increased recycled water use by the City. (Of course, the appropriate ratio of water exchange and cost would need to be negotiated).

These options were considered if additional supply is needed beyond what recycled water quantities are available in the Basin.

4.2.1 City of San Luis Obispo

The City of San Luis Obispo currently has a treatment capacity of 5.1 mgd (5,700 afy) at the Water Resource Recovery Facility (WRRF). The WRRF includes tertiary treatment and other unit processes required to meet stringent effluent quality limits intended to protect and enhance the receiving waters of San Luis Obispo Creek.

The average daily flow in 2013 was 3.4 mgd (3,800 afy) and flows from mid-June to mid-September reduce to 2.8 mgd (3,100 afy) due the absence of much of the Cal Poly population. The City is required to maintain a minimum average daily release, year-round, of treated effluent to San Luis Obispo Creek at a rate of 2.5 cfs (1.6 mgd or 1,800 afy) to provide satisfactory habitat and flow volume for coldwater fisheries habitat in San Luis Obispo Creek. In addition, recycled water production at the WRRF is also effected by storage and process limitations during peak irrigation demand.

The City of San Luis Obispo Water Reuse Project started recycled water deliveries in late 2006. By 2013, the City increased recycled water deliveries to 178 afy (0.2 mgd) to 31 sites for landscape irrigation. On an average annual basis, approximately 1,800 afy (1.6 mgd) is currently discharged to San Luis Obispo Creek that could potentially be reused. However, during the peak irrigation season, only up to 0.8 mgd[6] (900 afy) is available for potential reuse and storage and process limitations further reduce peak irrigation season supply.

The City is currently preparing a Recycled Water Master Plan Update and is exploring recycled water sales to agricultural customers outside of the city limits. The City is also upgrading the WRRF to meet the 2014 adopted discharge requirements that includes a goal of maximizing recycled water production. Cost for expansion of the City's recycled water system was not available at the time this TM was prepared but the City's updated recycled water master plan is expected to be completed in 2015.

[6] = 2.8 mgd (summer flows) – 1.6 mgd (discharge to creek) – 0.4 mgd (to existing customers; 0.2 * 2.0 seasonal peaking factor)

A recycled water exchange could occur but supply is limited. As noted above, the appropriate ratio of water exchange and cost would need to be negotiated.

4.2.2 State Water Subcontractors

The California Men's Colony (CMC), City of Morro Bay, Oceano CSD, and City of Pismo Beach have water supply agreements with the District for SWP deliveries. Each entity also operates its own wastewater treatment plant (WWTP), which the exception of Oceano CSD, whose wastewater flows to South San Luis Obispo Sanitation District (SSLOCSD) WWTP. A recycled water exchange could occur with a portion of contracted SWP water used in the Paso Basin instead of conveyed to these entities. The appropriate ratio of water exchange and cost would need to be negotiated.

Each entity previously explored the development of a recycled water system. Most recently, the City of Morro Bay, City of Pismo Beach, and SSLOCSD participated in the SLO RRWSP (Cannon, 2014). In addition, the City of Morro Bay is currently conducting a planning effort to define and site a new water reclamation facility (WRF) that includes water reuse plans. The effort also included evaluating reuse potential from CMC. Pismo Beach is also preparing a recycled water facilities plan to further pursue recycled water implementation. SSLOCSD is also currently preparing a recycled water feasibility study.

Recycled water opportunities for each contractor are discussed further in this section.

CMC currently produces disinfected tertiary effluent suitable for most types of non-potable reuse and delivers an average of 188 afy to Dairy Creek Golf Course. CMC produces approximately 1.2 mgd (1,340 AFY). Of this amount, CMC must maintain a minimum of 0.75 cfs (0.5 mgd; 540 afy) to Chorro Creek. This leaves a balance of 610 afy available for reuse; however, the actual volume available will likely be limited by peak season demand since irrigation demands are higher during this period. The New WRF Comparative Site Analysis (Rickenbach, 2014b) identified the potential for an additional 75 afy of use at the golf course, 546 acres or irrigated agriculture in the Chorro Valley, and 128 acres of land with potential for irrigated agriculture. Therefore, the potential demand exceeds potential supply. Cost estimates for service to the potential customers were not developed.

The New WRF Project Report on Reclamation and Council Recommended WRF Sites (Rickenbach, 2014a) identified potential types of reuse from the City of Morro Bay's new WRF: Irrigated Agriculture; Streamflow Augmentation in Creeks; Irrigation of Landscaping, Parks, and Golf Courses; and Groundwater Recharge. The report identified 2,736 afy of irrigated agriculture demand in the Morro Valley, 1,058 afy primarily of irrigated agriculture demand in the Chorro Valley, and 427 afy of landscape irrigation demand in the City of Morro Bay. The potential demands far exceed the potential supply of 1.5 mgd (1,680 afy).

The City of Pismo Beach currently discharges approximately 1.1 mgd (1,230 afy) of secondary effluent via an ocean outfall shared with SSLOSCD. SSLOCSD currently discharges approximately 2.6 mgd (2,910 afy) of secondary effluent via an ocean outfall

shared with the City of Pismo Beach. After taking into account a minimum ocean outfall flow volume of 1.0 mgd (1,120 afy), approximately 2.7 mgd (3,020 afy) could potentially be reused. Both WWTPs would require upgrades to tertiary filtration for most reuse options and may require blending with other water sources or demineralization to meet customer water quality needs. Also, Oceano CSD and SSLOCSD are separate legal entities so project beneficiaries may differ and an exchange with a Paso Basin entity must be negotiated with both entities.

The SLO RRWSP identified over 350 afy of potential non-potable demand for Pismo Beach with unit costs of potential recycled water projects ranging from approximately $1,500/af to nearly $9,000/af. The SLO RRWSP identified a range of reuse options for SSLOCSD, including landscape irrigation (270 afy), agricultural irrigation (1,900 afy), industrial reuse (1,100 afy), groundwater recharge (2,800 afy), and surface water augmentation (2,700 afy). Unit costs of potential recycled water projects range from approximately $1,000/af to nearly $6,000/af.

4.3 Summary of Supply Options

The recycled water supply options discussed in this section are summarized in Figure 4.3 and Table 4.9.

5.0 PRELIMINARY EVALUATION OF OPTIONS

This section evaluates the identified Recycled Water options to determine whether they should be deferred due to one or more of the criteria below or if they are appropriate for further evaluation in more detail in the next phase of work. This evaluation also identifies any potential fatal flaws with the options.

The criteria used during the analysis include:

- Institutionally/contractually/financially complicated compared to other options.
- Other option would need to be implemented first (not an independent project).
- Potential key partner not interested.
- Strong opposition at this time.

Each recycled water supply option is discussed in the following sections after a discussion of common technical and implementation issues for new recycled water projects.

5.1 In-Basin WWTP Options

This section includes sub-sections addressing technical and implementation issues:

- General (applicable for every WWTP).
- Applicable to potential types of reuse.

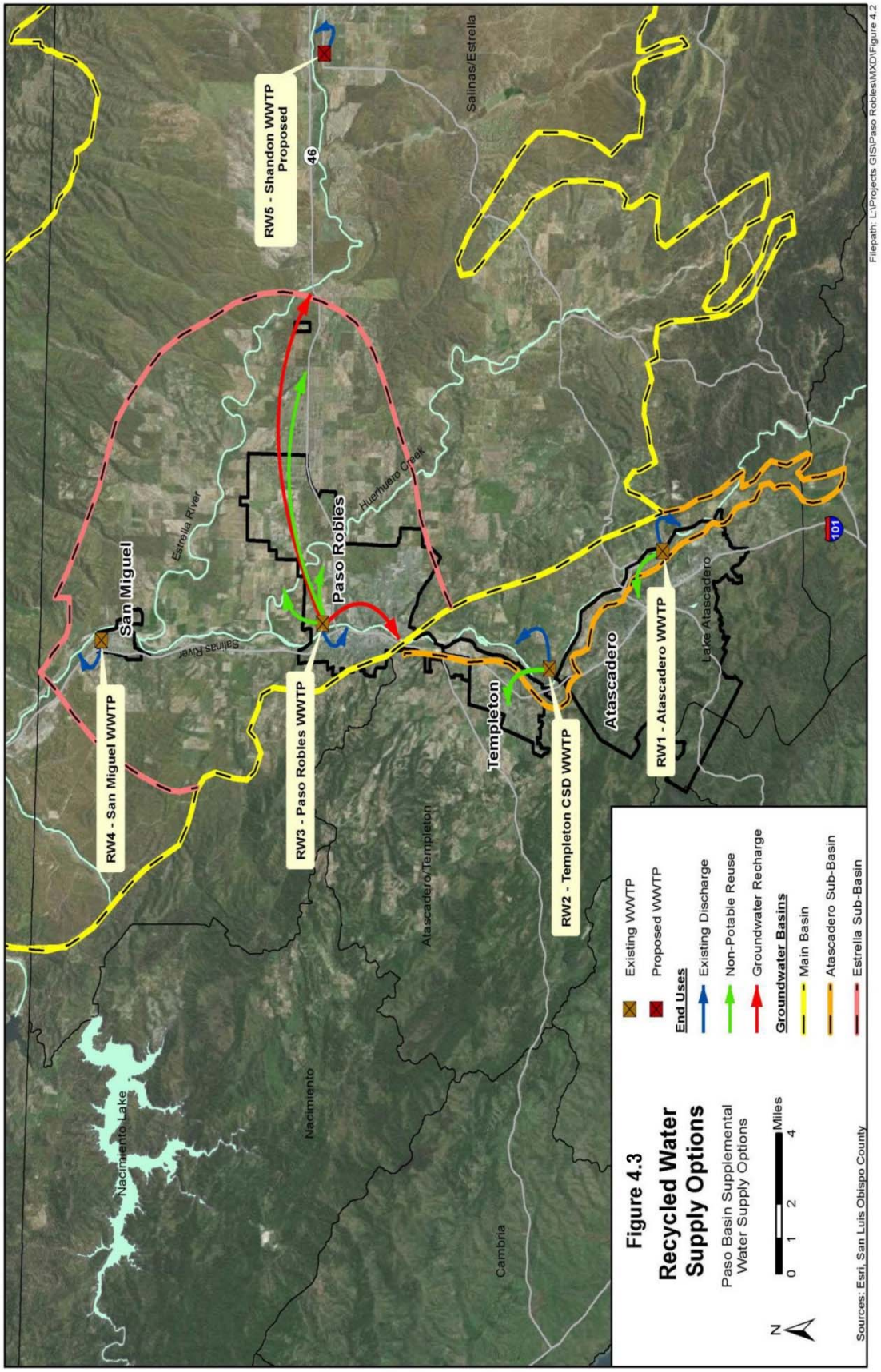

RW5 - Shandon WWTP Proposed
RW4 - San Miguel WWTP
RW3 - Paso Robles WWTP
RW2 - Templeton CSD WWTP
RW1 - Atascadero WWTP
San Miguel
Paso Robles
Templeton
Atascadero
Salinas/Estrella
Estrella River
Huerhuero Creek
Salinas River
Lake Atascadero
Nacimiento Lake
Nacimiento
Atascadero/Templeton
Cambria
46
101
Existing WWTP
Proposed WWTP
End Uses
Existing Discharge
Non-Potable Reuse
Groundwater Recharge
Groundwater Basins
Main Basin
Atascadero Sub-Basin
Estrella Sub-Basin
Figure 4.3
Recycled Water Supply Options
Paso Basin Supplemental Water Supply Options
Miles
0 1 2 4
N
Sources: Esri, San Luis Obispo County
Filepath: L:\Projects GIS\Paso Robles\MXD\Figure 4.2

Table 4.9 Summary of Recycled Water Supply Options
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

Supply Option		Estimated Supply (AFY)	Level of Treatment	Point of Delivery	Brief Description	Suitable End Uses
Basin WWTP Options						
RW1	Atascadero WWTP	up to 800	Upgrade WWTP to Tertiary	WWTP	Upgrade existing WWTP to tertiary treatment (plus additional treatment as needed for end use). Deliver recycled water to end use.	Discharge to Salinas River.. Municipal Non-Potable Reuse Non-Muni NPR. Agricultural Irrigation. Lake Supplement (Atascadero). Deep Basin Recharge / Injection. Blend with Nacimiento Water.
RW2	Templeton CSD WWTP	up to 440	Upgrade WWTP to Tertiary	WWTP		
RW3	Paso Robles WWTP	up to 3,300	Upgrade WWTP to Tertiary	WWTP		
RW4	San Miguel WWTP	up to 130	Upgrade WWTP to Tertiary	WWTP		
RW5	New Shandon WWTP	up to 560	New Tertiary WWTP	WWTP	Construct new WWTP and distribution system to end uses.	
Exchange Options						
RW6	Exchange with San Luis Obispo	up to 900	Existing (Tertiary)	WWTP	Fund expansion of SLO RW system in exchange for using an equitable volume of Nacimiento water in the Paso Basin.	Paso Basin: Refer to Nacimiento TM.
RW7	Exchange with SWP Contractor	up to 6,500	Tertiary	WWTP	Fund construction of a recycled water system in exchange for using an equitable volume of SWP water in the Paso Basin.	Paso Basin: Refer to SWP TM.

- Specific to water rights.
- Specific to each WWTP.

5.1.1 General Technical and Implementation Issues

The planning, design, construction, and operation of a new recycled water system have many common technical and implementation issues that are applicable to the recycled water supply options considered here. New recycled water systems can be very expensive compared with existing water supply options.

In general, a new recycled water system would require the following:

- If the WWTP owner and recycled water system owner are different entities, an agreement between both entities to either fund (or cost share) the capital and O&M costs associated with treatment plant upgrades for tertiary treatment or a purchase agreement for tertiary treated effluent.
- The WWTP owner must obtain a Water Reclamation Requirements permit from the Central Coast Regional Water Quality Control Board and a Title 22 Engineering Report to support permit application.
- The WWTP owner must prepare an environmental document compliant with CEQA, including addressing CWC Section 1211 (change in the point of discharge or place of use). Refer to Section 5.1.3 for further discussion.
- The recycled water system owner must fund (or find sources for funding of) planning, design, construction and operation of a new recycled water system.
- Willing customers to use recycled water must be identified and letters of commitments should be obtained prior to system construction.
- Funding / financing of retrofitting existing sites for the approved use of recycled water.
- The recycled water system owner must conduct ongoing operation and maintenance activities in additional to operating the system, such as regulatory reporting and training requirements.
- If the non-potable customer uses a private well, need agreements to reduce pumping of groundwater an equitable amount of recycled water delivered.
- For groundwater recharge, need sufficient hydrogeological assurance that the recycled water placed for recharge will reach the intended aquifer and area intended.
- For groundwater recharge with tertiary effluent, need to determine the availability and cost of blend water supplies.

5.1.1.1 System Ownership and Operations

Regarding recycled water system ownership and operations, the local potable water providers typically owns and operates the system within their service area. In fact, the potable water supplier to a potential recycled water customer can require compensation based on "duplication of service" if an existing or planned future potable customer converts to recycled water. An exception to this, are areas supplied by mutual water companies[7], such as Atascadero.

Outside of the potable water service area, a recycled water system could be constructed and operated by an existing or new private or public agency that would purchase recycled water from the owner of the system within the service area. Ownership and/or operations of recycled water system components within the parcel of a recycled water customer are subject to negotiation between the delivery system owner/operator and the customer.

5.1.1.2 Benefit of Existing Discharges

The benefit that existing WWTP discharges provide to the basin needs to be characterized. In addition, the potential benefit of planned reuse for increased water supplies to the basin also needs to be characterized. For example, a new recycled water project may deliver 100 afy and offset groundwater pumping by 100 afy but would only be creating 50 afy of new water supply for the basin. Estimated new water supply benefits will be evaluated within the updated groundwater basin model for a short list of selected projects to support the next phase of work.

5.1.2 Potential Types of Reuse

Putting recycled water to specific end uses is outside the scope of this effort;[8] however, the end use of recycled water potentially has impacts, such as water quality requirements and regulatory restrictions. The State of California regulates the use of recycled water based on its level of treatment in Title 22, Division 4, Chapter 3, Section 60301 et seq., California Code of Regulations (Title 22). Additional information on recycled water regulations and a link to Title 22 of the CCR can be found online[9]. A brief summary of potential types of reuse are summarized below and common technical and implementation issues associated with each use are summarized in Table 4.10.

- **Urban Reuse - Landscape Irrigation:** Common locations of use include parks, golf courses, cemeteries, school yards, freeway landscaping, sod farms, nurseries, and residential landscaping.

[7] AB 2443 (Duplication of Service: Mutual Water Companies), which was signed into law in 2014, allows a public agency to provided recycled water within the territory of a mutual water company, without compensation, if the new mutual water company is not providing recycled water service or developing plans to provide recycled water service by December 31, 2014.
[8] Refer to Section 2.1 of Technical Memorandum No. 1 – Project Goals, Objectives, Approach, and Evaluation Process (Draft, September 2014)
[9] www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/Lawbook.shtml

Table 4.10 Common Technical and Implementation Issues with Types of Reuse Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District	
Type of Reuse	**Common Issues**
Landscape Irrigation	Cost and funding of on-site customer conversions to comply with recycled water public health requirements Cannot reuse all available supply due to seasonal variation in demand
Urban Reuse – Other Uses	Limited market in the Paso Basin
Industrial Reuse	May require additional treatment beyond tertiary Limited market in the Paso Basin
Agricultural Irrigation	Requires blending with alternative water source or additional treatment likely required for salts Existing cost of water is much lower than cost to supply recycled water so a basin management framework is necessary to receive water supply benefit to justify cost
Environmental Reuse	Generally not offsetting a potable or groundwater demand
Indirect Potable Reuse	Blend water may not be available where it is needed Injection may be required to get the recharge water to aquifer location of highest need. Injection wells increase capital and O&M costs and regulations require advanced treatment (reverse osmosis and advanced oxidation) If reverse osmosis treatment is used, brine disposal can be expensive Public opposition
Direct Potable Reuse	Regulations are currently under development Public opposition Brine management will be expensive

- **Urban Reuse - Other Uses:** Dual plumbing (flushing toilets and urinals), priming drain traps, structural and nonstructural firefighting, decorative fountains, commercial laundries, consolidation of backfill around pipelines, artificial snow making for commercial outdoor use, commercial car washes (no public contact with washing), fish hatcheries with public access, soil compaction, mixing concrete, dust control on roads and streets, and cleaning roads, sidewalks and outdoor work areas, sanitary sewer flushing.

- **Industrial Reuse:** Use of recycled water in industrial applications and facilities, power production, and extraction of fossil fuels. Common industrial uses include for cooling tower makeup water, boiler feed water, and industrial processes.

- **Agricultural Irrigation:** Orchards and vineyards (edible portion); food crops, including root crops, where the edible portion contacts recycled water; food crops where the edible portion is above ground and not contacted by recycled water; pasture for animals producing milk for human consumption; any nonedible vegetation (controlled access).

- **Environmental Reuse:** The use of recycled water to create, enhance, sustain, or augment water bodies, including wetlands, aquatic habitats, or stream flow.

- **Potable Reuse**
  - **Indirect Potable Reuse:** Augmentation of a drinking water source (surface water or groundwater) with recycled water followed by an environmental buffer. Groundwater may receive additional treatment prior to use (for example disinfection); surface water would receive conventional surface water treatment.
  - **Direct Potable Reuse:** The introduction of recycled water into a public water system (e.g., distribution system) or into a raw water supply upstream of a water treatment plant.

5.1.3 Water Rights

Planned use of recycled water results in a change in place of use of at least some volume of treated wastewater from the existing discharge location. As a result, California Water Code (CWC) Section 1211 must be addressed to properly implement a recycled water project. In fact, three sections of the CWC explicitly address ownership and water rights with respect to treated wastewater:

- Section 1210: Ownership of treated wastewater.

- Section 1211: Change in point of discharge, place of use, or purpose.

- Section 1212: Protection of instream beneficial uses.

5.1.3.1 CWC Section 1210

CWC Section 1210 of the Water Code states that, between the owner of the wastewater treatment plant and the entities contributing the wastewater into the collection system, the owner of the treatment plant has exclusive rights to the treated wastewater. This does not mean that the treatment plant owner has exclusive rights to effluent. Water rights may accrue after discharge. The discharged water may also support instream or riparian habitat. Therefore, downstream water rights or environmental conditions may supersede the rights of the owner of the treatment plant to the use of the treated effluent. (SWRCB, 2014).

As an example, a portion of TCSD's effluent is conveyed to the Paso Robles WWTP but TCSD has an agreement with the city where TCSD retains ownership of the wastewater.

5.1.3.2 CWC Section 1211

California Water Code (CWC) section 1211 requires that prior to making any change in the point of discharge, place of use, or purpose of treated wastewater, approval must be obtained from the SWRCB Division of Water Rights. This process is designed to ensure that the change will not injure any legal user of water or negatively impact beneficial uses of the water, including water supply, recreation, and wildlife. Recycled water projects result in a change in place of use and purpose, and thus could be subject to SWRCB approval. The CWC 1211 process can be lengthy and challenging. It can take from one to two years to complete for noncontroversial projects and to up to ten years to complete for controversial projects, where there are disputes over water rights, potential impacts to beneficial uses, or project opposition.

The first step in gaining approval for the change in discharge is to submit a petition form to the SWRCB. Typically, the entity holding the National Pollutant Discharge Elimination System (NPDES) permit files the petition. While not explicitly required by law, in practice most petitions are filed with accompanying CEQA documents (draft or final), which helps to head off further inquiry by the SWRCB prior to approving a petition and in some cases, protests by project opponents. It would be difficult to demonstrate that a diversion has no significant impacts to fish and wildlife without providing relevant CEQA documentation.

After the petition for change has been submitted, but before the SWRCB renders a decision, the petitioner must notify the public and provide a written notification to the California Department of Fish and Game (DFG). Any “interested person” may protest the petition within the period allotted by the SWRCB.

The SWRCB independently investigates whether the no-injury rule will be met by using its Electronic Water Rights Information System (eWRIMS). Petitioners are encouraged to use eWRIMS and public records to verify whether existing water rights holders will be injured. This includes any rights that downstream users may have to recycled water discharged under common law regarding return flow. Recycled water would be considered return flow if the source of the recycled water is surface water or percolating groundwater that under natural conditions would reach the stream. Thus, for agencies that seek to transfer recycled water previously discharged to a stream to an off-site reclamation project, downstream water right holders could claim injury depending on whether the source of the recycled water originated inside or outside the watershed.

5.1.3.3 CWC Section 1212

CWC Section 1212 provides that a wastewater discharger (“wastewater producer”) can introduce wastewater into a watercourse with the stated intention of maintaining or enhancing instream beneficial uses, such as fishery, wildlife, or recreation. The discharger must state explicitly the reach of stream intended to be benefited and the discharged flows that will be maintained. In such a case, the Division of Water Rights will not grant an appropriation to another party for the discharged water. The discharger can revoke this

intent later, such as if it plans to replace discharge for direct delivery of recycled water to users. (SWRCB, 2014).

5.1.4 Specific Technical and Implementation Issues

5.1.4.1 Atascadero WWTP

The City of Atascadero own and operate the Atascadero WRF and the Atascadero Mutual Water Company provides potable water service to the community. A recycled water system could be constructed and operated by an existing or new public agency[10].

The City and AMWC both stated that a recycled water system is too expensive to increase water supplies for AMWC customers for the foreseeable future. Existing discharges provide benefit to the Atascadero Sub-Basin. Therefore, no recycled water projects have been identified for this study.

5.1.4.2 Templeton CSD WWTP

The Templeton CSD own and operate the Meadowbrook WWTP and provide potable water service to the community. The Templeton CSD is the likely owner and operator of a new recycled water system within the TCSD water service area.

TCSD is currently maximizing the water supply benefits of its Meadowbrook WWTP discharges through downstream retrieval with potable water wells and is considering increasing flows the plant by diverting sewage that currently flows to the Paso Robles WWTP. TCSD is evaluating the percolation capacity of the existing Selby Ponds to handle the proposed sewer diversion flows. A likely outcome is that TCSD will try to maximize percolation capacity to receive the associated water supply benefit.

Potential recycled water project costs exceed $2,000/af and, therefore, TCSD preferred approach is to maximize percolation at the Selby Ponds.

5.1.4.3 Paso Robles WWTP

The City of Paso Robles own and operate the Paso Robles WWTP and provide potable water service to the community. The City of Paso Robles is the likely owner and operator of a new recycled water system within the City.

The City has expressed interest in maximizing the beneficial use of its wastewater, including use for agricultural irrigation and/or groundwater recharge outside of City limits.

[10] AB 2443 (Duplication of Service: Mutual Water Companies), which was signed into law in 2014, allows a public agency to provided recycled water within the territory of a mutual water company, without compensation, if the new mutual water company is not providing recycled water service or developing plans to provide recycled water service by December 31, 2014.

5.1.4.4 San Miguel WWTP

The San Miguel CSD own and operate the San Miguel WWTP and provide potable water service to the community. The San Miguel CSD is the likely owner and operator of a new recycled water system within the SMCSD service area.

The SMCSD stated that a recycled water system is too expensive to increase water supplies for its customers for the foreseeable future.

5.1.4.5 New Shandon WWTP

A new WWTP in Shandon would be driven by the need to manage wastewater from potential new development. The WWTP would be operated by and revenues collected by either a new local district or the County.

5.2 Recycled Water Exchange Options

The recycled water exchange options are comprised of a Paso Basin entity funding new use of recycled water outside of the basin in exchange for new water within the basin, such as Nacimiento water or SWP water. The key components of an exchange project include:

- Contract between the Paso Basin entity and the recycled water system owner / operator to pay for planning, design, construction, and operation of all or a portion of a recycled water system, including treatment, distribution, and management.
  - The Paso Basin entity would likely be a partner / investor / shareholder in the system and would pay an agreed upon proportionate share of system costs.
  - For an existing system, such as San Luis Obispo's, payment also could include the cost of previous investment in wastewater treatment and distribution system capacity and redundancy.
- Contract between the Paso Basin entity and the recycled water system owner / operator that specifies an equitable ratio of Nacimiento or SWP water to be available for use by the Paso Basin entity.
  - The equitable ratio may or may not be 1:1. In particular, the reliability and availability of SWP water must be considered.
  - The exchange should be based on recycled water beneficially reused once the system is operating instead of estimated demands.
- Project within the Paso Basin to use the exchanged Nacimiento or SWP water.

An exchange project would require the implementation of two projects for the Paso Basin entity to receive a water supply benefit – the out-of-basin recycled water project and the in-basin exchanged water project. This complicates implementation, and the costs of both projects may make an exchange project too expensive. Since the in-basin conveyance and delivery facilities would likely be the same for Nacimiento or SWP water regardless of how it

was acquired, the primary driver for an exchange project is the cost to directly acquire the water compared with the cost of the exchange.

Based on preliminary findings from the TM No. 2 (Nacimiento Project) and TM No. 3 (SWP Water), the cost to create a new recycled water supply for the entities considered in this TM (San Luis Obispo and SWP Contractors) likely exceeds the cost to directly acquire the same volume of water through existing options.

5.3 Evaluation Summary

Table 4.11 summarizes preliminary evaluation criteria results for each potential project.

Table 4.11 Comparison of Water Supply Options - Fatal Flaw Analysis
Paso Robles Groundwater Basin Supplemental Supply Options Study
San Luis Obispo County Flood Control and Water Conservation District

	Supply Option	Uncomplicated(1)	Independent(2)	Partner Support(3)	Public Support(4)
RW1	Atascadero WWTP	○	◗	○	◗
RW2	Templeton CSD WWTP	○	◗	◗	◗
RW3	Paso Robles WWTP	◗	●	●	●
RW4	San Miguel WWTP	○	○	○	◗
RW5	New Shandon WWTP	○	○	◗	◗
RW6	Exchange with San Luis Obispo	○	○	◗	◗
RW7	Exchange with SWP Contractor	○	○	◗	◗

Notes:

● = positive (meets criteria); ◗= neutral; ○ = negative (does not meet criteria)

(1) Not institutionally/contractually/financially complicated compared to other options.
(2) Independent project, not reliant on implementation of other project first.
(3) Potential key partner(s) are interested.
(4) Public support for project at this time.

Table 4.12 presents recommendations for placement of each project either into lists based evaluation criteria results. The project placement lists are:

- Fatal flaw list (those options screened out).
- Deferred list (those that may have merit but are not within the scope of this study or include a degree of complexity that does not meet the criteria for passing onto next phase for strategy development).
- Strategy Development list (passing into next phase for further evaluation).

Table 4.12 Comparison of Water Supply Options - Fatal Flaw Analysis Paso Robles Groundwater Basin Supplemental Supply Options Study San Luis Obispo County Flood Control and Water Conservation District					
	Supply Option	**Estimated Supply AFY(1)**	**Timeline and Duration(2)**	**Criteria Triggered**	**Placement**
RW1	Atascadero WWTP	up to 800	S/P	High cost with low benefit Potential key partner not interested.	Fatal Flaw List
RW2	Templeton CSD WWTP	up to 440	S/P	High cost with low benefit Potential key partner not interested at this time.	Fatal Flaw List
RW3	Paso Robles WWTP	up to 3,300	S/P	Not applicable.	Pass to Rough Screening
RW4	San Miguel WWTP	up to 130	S/P	High cost with low benefit. Potential key partner not interested at this time.	Fatal Flaw List
RW5	New Shandon WWTP	up to 560	L/P	Dependent on construction of a new WWTP.	Deferred List
RW6	Exchange with San Luis Obispo	up to 900	M/P	Lower cost option available to acquire Nacimiento water.	Deferred List
RW7	Exchange with SWP Contractor	up to 6,500	M/P	Lower cost option available to acquire SWP water.	Deferred List

Notes:

(1) Recycled water supply availability between dry, normal, and wet years ranges slightly but not significantly. In wet years, flows may increase during the wet season primarily due to increased sewer infiltration/inflow. In dry years, flows may decrease slightly due to public awareness of conservation.

(2) Short-term (S), Medium-Term (M) or Long-Term (L) / Temporary (T) or Permanent (P).

6.0 SUMMARY OF FATAL FLAWS ANALYSIS AND RECOMMENDATIONS FOR FURTHER CONSIDERATION

6.1 Pass to Strategy Development

Based on the preliminary evaluation of potential recycled water projects, one potential recycled water supply option is recommend for evaluation in more detail:

- Paso Robles WWTP.

The Paso Robles WWTP offers the largest potential recycled supply in the Basin with up to 3,300 afy currently discharged to the Salinas River. Reuse opportunities within the City of Paso Robles were explored in the Paso Robles Recycled Water Master Plan. It is recommended that options beyond the City be explored further during the next phase of this study. In particular, further investigation is warranted for delivery of recycled water for

agricultural irrigation and/or groundwater recharge as well as blending recycled water with untreated Nacimiento Project water to improve water quality and maximize use Nacimiento Project water.

6.2 Fatal Flaw List

Based on the preliminary evaluation of potential recycled water projects, three potential recycled water supply options are screened out:

- Atascadero WWTP.
- Templeton CSD WWTP.
- San Miguel WWTP.

These projects are screened out primarily due to the high cost compared with the limited water supply benefit and lack of key partner interest.

6.3 Deferred List

Finally, based on the preliminary evaluation of potential recycled water projects, three potential recycled water supply options are to be considered at a future date (deferred):

- New Shandon WWTP.
- Exchange with San Luis Obispo.
- Exchange with SWP Contractor.

The exchange projects may prove to be feasible in the future but other lower cost options that are less complicated to implement are available at this time. The new Shandon WWTP is dependent on the timing of and funding from new development.

6.4 Next Steps – Strategy Development

This initial phase of work has identified supply options from each of the supply types (Nacimiento, State Water and Recycled Water) available to supplement the Paso Robles Basin in terms of quantity, suitable uses, transfer points and implementation issues. In the next phase of work, the options that passed this initial screening will be carried forward into a more detailed strategy development process. The options will be further evaluated as to the reliability of supply (quantity and quality), potential costs, environmental impacts, schedule for implementation, time of use, regulatory/legal/permitting approvals, public acceptance, and technical complexity.

Additionally, the computer model of the Paso Basin will be used to identify the potential benefits that may be gained from implementation of one or more of these options. As part of

the next phase of work, the potential to combine options for additional cost effectiveness and greater benefit will also be considered.

7.0 REFERENCES

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