

TO: City Council
FROM: Doug Monn, Public Works Director
SUBJECT: Recycled Water Master Plan Adoption
DATE: April 15, 2014

NEEDS: For the City Council to consider the 2014 Recycled Water Master Plan.

FACTS:

1. City Council authorized a contract with AECOM for the preparation of a Recycled Water Master Plan on December 21, 2010.
2. The Master Plan was authorized in recognition that additional water sources increase water supply reliability, and preserve potable water supplies for drinking water.
3. AECOM proceeded with the Master Plan preparation, identifying infrastructure needed to convey up to 5,400 acre-feet per year (the estimated wastewater volumes at buildout).
4. Recycled water could meet irrigation needs of some customers that are now served from the potable water system, it could be delivered to parcels in the City that are now utilizing private wells, and it could be sold to irrigators outside the City limits for a more regional groundwater basin benefit.
5. A concept identified in a previous master plan dated 2006 suggested that discharging recycled water up-river from the City's wells may hold promise. The 2014 study established that yields resulting from that approach are far less than direct delivery of recycled water in lieu of irrigating with well water.
6. The Recycled Water Master Plan report is available for public review at <http://bit.ly/prcity-rwmp>

ANALYSIS &

CONCLUSIONS: AECOM recommends a recycled water delivery system that extends from the City's wastewater treatment plant eastward out the Highway 46 corridor. Potential in-City recycled water customers could include Barney Schwartz Park, Black Ranch, Hunter Ranch, The Links Golf Course, Paso Robles Golf Club, and others. The potential customers and forecasted recycled water demands update the estimates published in the City's previous master plan dated 2006. In all, recycled water customers within the City could use approximately 1,550 of the 5,400 acre-feet per year available.

The remaining available recycled water could be used as in lieu supply to irrigators north and east of the City limits. Alternatively, available water could be discharged into the Huer Huero Creek or distributed through overhead sprinklers at the Airport

for basin recharge. In both cases, the City would seek a regional partner to pay for their portion of the delivery system.

An issue of concern in reusing treated effluent is salt content. Customers add to the salinity levels as we use water in our homes and businesses such that by the time flow reaches the wastewater treatment plant, the resulting flow stream is comparably high in salinity. Recycled water that is high in chlorides and "total dissolved solids", for example, are less desirable as irrigation supply because some plants do not thrive in such waters. Waters that are higher in boron content pose similar concerns.

To address this, the master plan forecasts blending recycled water with either well water or available Nacimiento water, while the City could further reduce salinity in the wastewater stream by introducing more treated Nacimiento water into the potable system and controlling use of water softeners.

Construction of a recycled water delivery system could be phased. The first phase would be construction of the recycled water production facilities at the wastewater treatment plant (see related business item on tonight's Council agenda) and approximately the first mile of pipeline. Subsequent phases would extend piping as shown on the attached System Layout.

Estimated cost to construct all phases of the master-planned system is \$46 million. That figure includes capacity for users outside the City limits and the expectation is that those customers would pay their proportionate share.

POLICY

REFERENCE: Integrated Water Resources Plan, 2010 Urban Water Management Plan, 2011 Paso Robles Groundwater Basin Management Plan (aka AB3030 Plan).

FISCAL

IMPACT: None.

OPTIONS:

- a. Adopt Resolution No. 14-XX, thereby adopting the Recycled Water Master Plan dated March 2014.
- b. Amend, modify, or reject the above option.

ATTACHMENTS:

1. Proposed Recycled Water Master Plan Executive Summary
2. Proposed Recycled Water Master Plan System Layout
3. Resolution No. 14-XX

Attachment 1
Recycled Water Master Plan
Executive Summary

City of El Paso de Robles Recycled Water Master Plan

Master Plan Author – AECOM

March 31, 2014

Executive Summary

The City of El Paso de Robles operates a potable water system that supplies approximately 6,700 acre-feet of water each year to residents and businesses, and also operates a wastewater collection system that returns flow to the City's wastewater treatment plant (located northeast of Highway 101 / 46 intersection). Approximately 3,300 AFY of treated effluent from that plant is currently discharged via a series of ponds back into the Salinas River system.

The wastewater treatment plant is undergoing an upgrade now both for compliance with current discharge requirements and for potential future reuse of treated effluent. This update of the Recycled Water Master Plan was commissioned to:

- Identify potential recycled water customers;
- Forecast the quality of recycled water;
- Evaluate recycled water distribution system options to meet in-City demands as well as potential uses in surrounding areas (i.e. the groundwater basin and/or neighboring irrigators);
- Look for opportunities to phase the construction of a recycled water delivery system, and;
- Develop planning-level cost opinions for the phased system.

Potential Customers

Recycled water is suited for irrigation and other non-potable water supply such that larger irrigators are primary potential customers. Irrigators within the City are located such that extending a recycled water delivery system eastward more than 3 miles from the treatment plant along the Highway 46 corridor would serve the most customers. Key potential in-City customers include:

Black Ranch
Hunter Ranch
Agricultural Acreage in Airport Area
Barney Schwartz Park

The Links Golf Course
Paso Robles Golf Club
River Oaks

In all, in-City irrigation customers in planned recycled water service areas may use approximately 1,520 AFY of available recycled water (2.9 million gallons per day during the maximum month). The larger of these potential users currently operate private wells to meet their irrigation needs. Customers that may be eligible to switch from the potable water system to the proposed recycled water system represent approximately 428 acre-feet per year.

Serving this set of in-City customers would leave approximately 1,780 AFY of recycled water available for other uses, more as the City grows. Potential users north and east of the City limits include:

Vina Robles Vineyard
(approx. 535 irrigated acres)
Other vineyards – “Northeast Irrigation Area”
(approx. 2,170 irrigated acres)

Other vineyards – “Eastern Irrigation Area”
(approx. 1,030 irrigated acres)

In all, potential irrigators north and east of the City limits could use the balance of available recycled water *during the irrigation season* and would require extension of the distribution system to do so.

Even with a full set of recycled water customers using all available water during the summer irrigation months, the City would have to maintain a means of winter season water disposal. This is addressed in the Basin Recharge section below.

Water Quality

An issue of concern in reusing treated effluent is salt content. Customers add to the salinity levels as we use water in our homes and businesses such that by the time flow reaches the wastewater treatment plant, the resulting flow stream is comparably high in salinity. Recycled water that is high in chlorides and “total dissolved solids”, for example, is less desirable as irrigation supply because some plants do not thrive in such waters. Waters that are higher in boron content pose similar concerns. Conventional wastewater treatment processes treat the biologic / nutrient content of the water but are not designed to reduce salinity or boron content.

Paso Robles’ setting with regard to salinity and boron can be summarized as:

	City well water ¹	Estrella area wells ²	WWTP Effluent	Goal for Irrigation ³
Total dissolved solids, mg/L	510-530 average	400 to 700	832-1,000 ⁴	<450
Chlorides, mg/L	63	50 to 80	260-380 ⁵	<106
Nitrates, mg/L	5.96	Below 40	5.4-8.1 ⁶	n/a
Boron, mg/L	0.22		0.61 ⁷	<0.5

¹ “Paso Robles 2012 Water Quality Report” and “Paso Robles Water Treatment Plant Project Preliminary Design Report, Technical Memo No. 3”, Black & Veatch, 2008 and “Water and Wastewater Quality Concerns – Water Quality Strategy”, Malcolm Pirnie, Inc., 2003

² “Paso Robles Groundwater Subbasin Water Banking Feasibility Study” by Fugro and Cleath, 2008

³ Quality guidelines classified as “no problem” for irrigation as stated in “Recycled Water Study Update”, Table 3.1, Boyle Engineering Corp., 2006

⁴ “Water and Wastewater Quality Concerns – Water Quality Strategy”, Table 2-11, Malcolm Pirnie, Inc., 2003 and input from M. Thompson, Wastewater Resource Manager.

⁵ “Recycled Water Study Update”, Boyle Engineering Corp., 2006

⁶ “Recycled Water Study Update”, Boyle Engineering Corp., 2006

⁷ Plant effluent grab sample taken Aug 24, 2006

The potential recycled water customers listed in the previous section are irrigating with well water that has a TDS level of approximately 400-700 mg/L. Recycled water from the City's treatment plant would approach twice that salt concentration unless:

- the City's potable water treatment plant comes on line and introduces increasing volumes of softer Nacimiento waters into its delivery system;
- customers add less salt by making industrial pretreatment improvements and using fewer residential water softeners, and/or;
- recycled water were blended with lower salinity waters prior to irrigation.

In February 2014, the City awarded the construction contract for a 2 million gallon per day potable water treatment plant, a step that is expected to somewhat lower salt levels at the wastewater treatment plant. Also, the City undertakes an industrial pretreatment program and may in the future consider steps to control use of residential water softeners. This, too, would lower salt levels at the wastewater plant.

Still, future customers will notice that recycled water is notably more saline than groundwater, to the degree that irrigators will likely blend recycled supplies with well water. An assumed level of blending is reflected in the usage projections throughout this report.

Basin Recharge

Irrigation is seasonal while flow through the City's wastewater treatment plant is near-constant. This means that the City must continue to dispose of treated effluent during the Winter months and could do so:

- at the current location into the Salinas River (which is down-gradient of the City's supply wells);
- upstream of the City's potable water supply wells with the intent of benefitting the yield from those wells, or;
- 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 benefits of continued discharge into the Salinas River at the current location are that discharge permits are in-hand and no additional infrastructure would be needed. However, sustaining that practice does not directly benefit City wells.

The benefit of discharging recycled water upstream of the City's existing wells would be additional well yield but only 10 to 46 AFY is projected. The disadvantages of this practice include the need for more than 3 miles of transmission pipe plus recovery wells in addition to the need for a significant quantity of blending water to meet public health requirements.

The benefits of discharging recycled water seasonally to a location east of the City (presumably into the Huer Huero Creek channel) could include direct benefit to the area in most need of recharge, continuing recharge into a Salinas River tributary, and sustaining year-round flows in the proposed recycled water delivery system. The disadvantage of this practice is little direct benefit to the City, rather this practice may pose a regional water supply benefit.

Potential for Conveying Nacimiento Water

Constructing a recycled delivery system eastward out the Hwy 46 corridor presents an additional opportunity – use of the delivery system to wheel available Nacimiento water out into the Estrella Area.

This concept would encourage use of available Nacimiento supplies in the more stressed area of the groundwater basin and introduce more water into the Huer Huero Creek channel, also for the regional benefit of the basin.

Blending with Nacimiento water has a water quality advantage, too. Nacimiento TDS levels are approximately 180 mg/L compared to City recycled water quality at 832 to 1,000 mg/L TDS.

Forecasted Costs

Major components of proposed delivery systems (refer to **Figure ES-1**) are identified in this study along with engineer's opinion of probable project costs. Budget level capital cost estimates are:

Phase 1 (Service Area A)	\$6.3 million
Phase 2 (Service Areas A and B)	+\$35.4 million
Phase 3 (Service Areas A, B, and C)	<u>+\$4.3 million</u>
TOTAL =	\$46 million

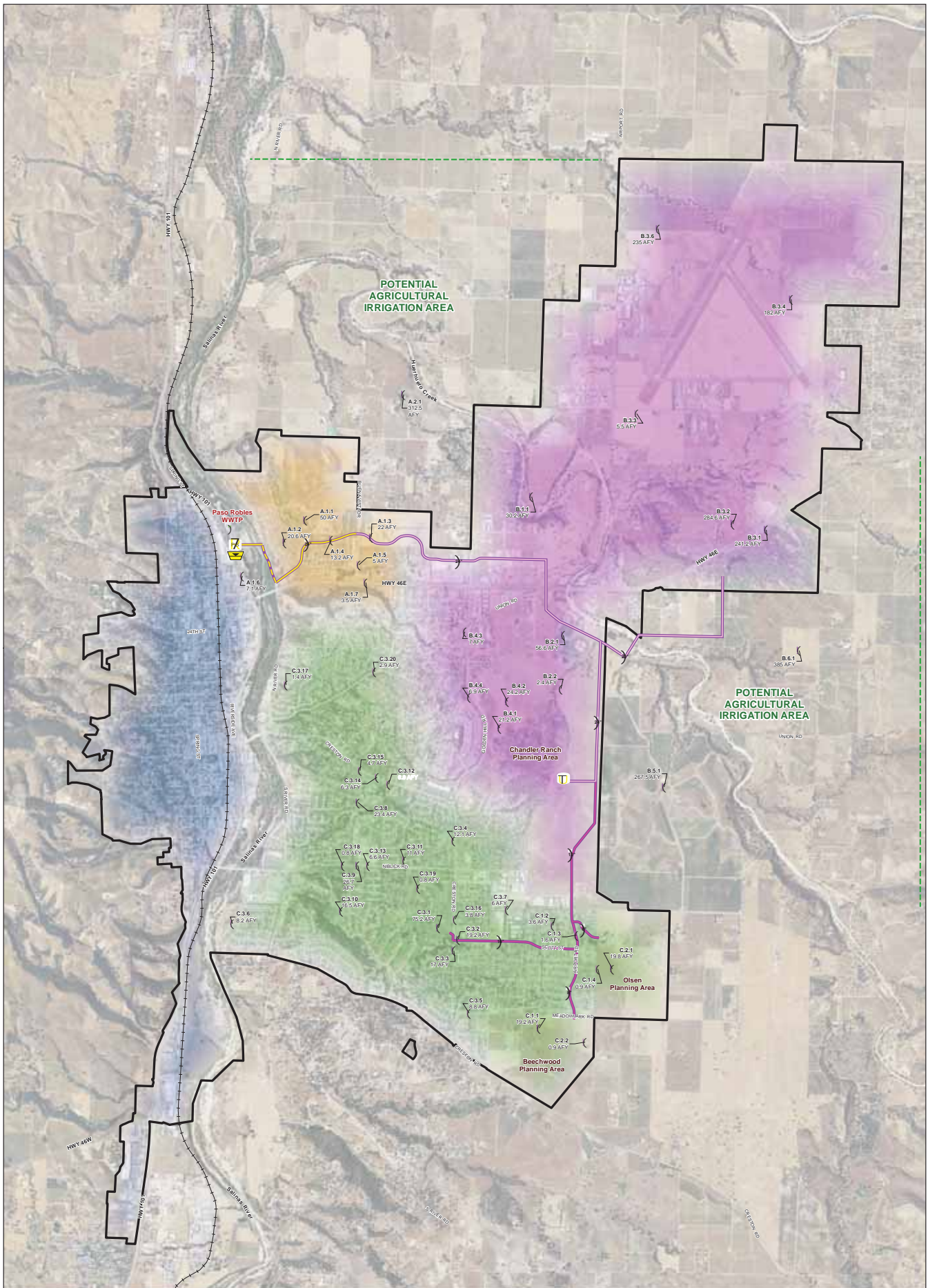
A financial analysis is now underway, but initial observations are that this is too costly a system to be financed solely by users within the City limits. The system would make economic and water resource sense if it served broader regional needs and were financed by both City users and outside irrigation partners.

Next Steps

1. Translate the forecasted recycled water project costs into a financial plan, illustrating cash flow needs and likely revenue from new customers and user rates. Evaluate that forecast in conjunction with potable water and wastewater financial plans to hone in on likely project timing.
2. Host meetings with potential larger customers to discuss the contemplated water source, especially water quality.
3. Provide an overview of the recycled water plan to regional water management groups in terms of location, quality, yield, and timing of this supplemental water project.
4. Follow through on salt loading recommendations (i.e. build the Nacimiento water treatment plant, seek voluntary reduction in water softening, then pursue limiting ordinances as-needed).
5. Based on the above steps and on dialogue with potential users, work with City Council to determine financing approach and construction timing for recycled water.

*Executive Summary Author
Christine M. Halley, TJCross Engineers*

Attachment 2
Proposed Recycled System Layout



Legend

- City Limits
- Railroad
- Waste Water Treatment Plant
- Extent of Potential Agricultural Irrigation Uses Considered

Recycled Water System

- Existing Pipeline - Reach A
- Proposed Pipeline - Reach A
- Proposed Pipeline - Reach B
- Proposed Pipeline - Reach C
- Pump Station
- Water Tank
- Reservoir

SITE ID

AFY

AFY

AFY

AFY

AFY

AFY

- Demand Node
- Service Area A
- Service Area B
- Service Area C
- West Side Service Area (Future Planning Phase)

**Paso Robles Recycled Water Master Plan
ES-1 : System Layout**

City of Paso Robles
Project No: 60194173



Attachment 3
Resolution No. 14-XX

RESOLUTION NO. 14-xxx

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF PASO ROBLES
ADOPT THE RECYCLED WATER SYSTEM MASTER

WHEREAS, in December 2010 after a competitive selection process, the City awarded a contract to the engineering firm AECOM to prepare an update to the City's Recycled Water Master Plan; and

WHEREAS, AECOM delivered the final report to the City in March 2014; and

WHEREAS, the City's Integrated Water Resources Plan calls for diversification of water resources and increased reliability of water supplies; and

WHEREAS, the City's 2010 Urban Water Management Plan identifies recycled water as a future water supply source; and

WHEREAS, the citizens of Paso Robles would be well-served by putting recycled water from the City's wastewater treatment plant to beneficial use; and

WHEREAS, available recycled water could also be delivered outside the City limits to irrigators who would otherwise be pumping groundwater from the Paso Robles Groundwater Basin; and

WHEREAS, pumpers across the Paso Robles Groundwater Basin seek to organize a governance structure (California Water District, AB 3030 group, or other) to facilitate regional water supply enhancements; and

WHEREAS, partnering with that proposed governance structure on a recycled water delivery system may hold benefits to both the City and to basin pumpers.

THEREFORE, BE IT RESOLVED AS FOLLOWS:

SECTION 1. The City Council of the City of Paso Robles does hereby adopt the "Recycled Water Master Plan" dated March 2014 by AECOM.

PASSED AND ADOPTED by the City Council of the City of Paso Robles this 15th day of April 2014 by the following votes:

AYES:

NOES:

ABSENT:

ABSTAIN:

ATTEST:

Duane Picanco, Mayor

Caryn Jackson, Deputy City Clerk