Northern Nevada Water Planning Commission

STAFF REPORT

DATE: July 28, 2016

TO: Chairman and Members, Northern Nevada Water Planning Commission ("NNWPC")

FROM: Jim Smitherman, NNWPC Water Resources Program Manager
Chris Wessel, Water Management Planner

SUBJECT: Presentation of comments received on the "Wastewater and Watershed-Based Water Quality Planning" chapter for the 2016 Regional Water Management Plan ("RWMP") update; discussion and possible direction to staff.

SUMMARY

Since the last presentation of this chapter to the NNWPC at the July 6, 2016 meeting, staff has incorporated comments concerning Section 4.3, renamed "Regional Effluent Management Planning", provided by technical staff from the City of Reno, the City of Sparks, Washoe County, and the Truckee Meadows Water Authority. Recommended revisions resulting from comments received are shown as redlined edits. Staff is requesting any additional comments for this section from the Commission.

RECOMMENDATION

Staff recommends that the NNWPC accept the report on comments received and proposed revisions to the "Wastewater and Watershed-Based Water Quality Planning" chapter for the 2016 RWMP update, and, if acceptable, approve the changes and provide direction to staff as appropriate.

JS:df

Attachment: Section 4.3 "Regional Effluent Management Planning"

Chapter 4 – Wastewater and Watershed-Based Water Quality Planning

4.3 Regional ~~Effluent Management~~~~Wastewater Facility~~ Planning

The ~~re~~use ~~and disposal~~ of reclaimed water from the various water reclamation facilities in the Planning Area may eventually be constrained by one or more ~~a number of~~ factors, which ~~if they continue to be operated as independent systems.~~ could include compliance with existing or future water quality standards, lack of future reclaimed water customers, insufficient winter storage and/or conveyance infrastructure. Regional water management challenges in the Planning Area include such complex, integrated issues as:

- Ensuring that the existing wastewater treatment plants are prepared to meet existing nutrient limitations in the face of anticipated growth
- Ensuring that the responsibility to meet any new water quality standards that affect receiving waters are shared by all entities contributing to the poor water quality
- Ensuring sustainable water supplies and infrastructure to meet the needs of existing customers, ~~as well as~~and future demands within and outside the TMSA (same as 1st bullet)
- Providing appropriate water quality and treatment capacity at various wastewater treatment facilities
- Providing for adequate reclaimed water demands, reclaimed water system capacity and effluent disposal capacity
- Addressing competing needs for the limited water resources available in the Planning Area to meet commitments to water supply, water quality, instream flows and the environment

In 2008, the NNWPC and WRWC initiated a collaborative effort among key staff from Reno, Sparks, Washoe County, SVGID and TMWA to develop recommendations to address effluent management issues in the Planning Area, using circumstances that existed in the North Valleys at that time: a high growth rate, high population growth projections, planned water importation and an abundance of undeveloped land uses and zoning. Staff concluded that, if the region is going to spend the same amount of money for water and wastewater infrastructure, regardless of effluent disposal or reuse methods, the region should make the investment that maximizes the benefits provided by the available water resources.

Enhanced Nitrogen Removal Planning Study

In 2013, following an upset at TMWRF resulting in a nitrogen discharge violation, the WRWC paid for the Enhanced Nitrogen Removal Planning Study conducted by Carollo Engineers. The final Technical Memorandum prepared for the City of Reno identified three treatment technologies, one of which may be selected to supplement existing nitrogen treatment at TMWRF: enhanced coagulation; advanced oxidation; and reverse osmosis ("RO"). Additional evaluations of enhanced nitrogen removal technologies are ongoing.

Although TMWRF operations have been smooth with no upsets since the 2013 violation, discharge limitations for nitrogen may present significant compliance challenges as wastewater flows and/or strength increase over time. Of the three enhanced nitrogen removal treatment

technologies studied by Carollo, RO has the advantage of removing not only nitrogen, but phosphorus, total dissolved solids and other compounds that may be of concern in the future. Disadvantages include a concentrate (brine) stream generated by RO treatment consisting of approximately 10-15 percent of the feed flow. Water reclamation facilities in coastal locations typically use ocean discharge for concentrate disposal, but inland facilities must develop alternative management strategies. Options for the management and disposal of reject concentrate from the RO treatment process have not been investigated. This topic was not within the scope of the Carollo study, which assumed deep-well injection for concentrate disposal. Enhanced coagulation and advanced oxidation have a greater viability in this region because there is no brine stream requiring disposal. Both technologies are relatively expensive however, requiring significant energy and/or chemical addition.

~~With regional coordination and cooperation, the possible uses for reclaimed water could be expanded to include uses such as residential landscape irrigation, groundwater recharge or indirect potable reuse. NDEP does not permit the use of reclaimed water on residential homes and is not currently considering a change in this position. However, the use of high quality reclaimed water for these purposes, or others, would provide additional means of beneficially utilizing the reclaimed water, while at the same time extending the region's limited water supplies.~~

In December 2014, the NNWPC directed staff to summarize wastewater master planning in the Planning Area and outline a scope of work for a wastewater and effluent management master plan update. Technical staff from the City of Reno, the City of Sparks, Washoe County and the Truckee Meadows Water Authority had been meeting to discuss regional effluent management issues since April 2014, and welcomed NNWPC participation. This informal group is generally referred to as the "Regional Effluent Management Team" (the "Team"). The Team is working toward regionally-based solutions to several near-term effluent management issues; acknowledging that the strategies developed may form the framework for an up-to-date regional effluent management master plan that will cover all of the Planning Area's publicly-owned water reclamation facilities and service areas.

The near-term effluent management issues focus on reducing the nitrogen load to the Truckee River by maximizing the use of Truckee Meadows Water Reclamation Facility ("TMWRF") reclaimed water at locations away from the river in allowable quantities and during appropriate times of the year, while maintaining a balance with Truckee River flows consistent with State water law and TROA. A variety of alternatives and scenarios are being evaluated using population and employment growth projections to estimate wastewater flow increases over time. The Team is taking steps to ensure a thorough understanding of the complex implications for effluent management scenarios before making any recommendations.

Scenarios being evaluated include:

- Developing a year-round reclaimed water demand, possibly Tahoe Reno Industrial Center ("TRI Center") and/or infiltration to groundwater
- Constructing an intertie pipeline, between TMWRF and Huffaker Reservoir, located at STMWRF, allowing for seasonal storage of TMWRF effluent and greater flexibility for reclaimed water use
- Demonstrating advanced water treatment technology consistent with proposed revisions to State regulations concerning "exceptional quality" recycled water standards

Water balance scenario evaluation using linear optimization programming: Desert Research Institute ("DRI") is using a linear optimization model to compare strategies for distributing effluent between TMWRF and STMWRF to meet customer demands while minimizing the nitrogen load to the Truckee River. DRI's scope of work includes an evaluation of strategies and constraints including:

- a proposed intertie pipeline to connect TMWRF and STMWRF/Huffaker Reservoir using the Southeast Connector Roadway Project right of way;
- existing customer effluent demands;
- future effluent demands including potential large volume customers such as TRI Center;
- Rapid Infiltration Basin(s) ("RIB"); and
- water rights constraints

Initial findings from the evaluation include the following:

- Annualized use of effluent is beneficial for reducing nitrogen loading to river.
- Huffaker Reservoir provides a cushion in the event of a plant upset at TMWRF and off-season storage of TMWRF effluent..
- TRI Center demands were used in the model as a surrogate for other potential year round demands such as RIBs, other large industrial uses, and/or groundwater replenishment.
- Intertie pipeline and TRI Center could provide a firm a demand for future TMWRF and STMWRF effluent.
- STMWRF effluent provides water with no additional return flow water rights requirement.

Ongoing DRI modeling simulations continue to refine the evaluation of the intertie pipeline, in addition to the feasibility of various TRI Center deliveries for current and future scenarios through 2034. The model has been updated to reflect new information, including STMWRF effluent demand projections, seasonal TRI Center demands and the addition of a 1,400 AF effluent storage reservoir at TRI Center.

One of the key considerations of the current evaluation involves the effluent return flow requirement for the Truckee River. The model tracks TMWA's groundwater and surface water production during both drought and normal years to estimate the seasonal groundwater component of the effluent. Taking the results from the DRI model, the Team will consider the groundwater component, Water Quality Settlement Agreement ("WQSA") water rights, and other surface water resource options to ensure that the effluent return flow component is satisfied under varying demand and hydrologic conditions, consistent with TROA operations.

The model results will provide decision makers with the technical information to consider whether the intertie pipeline and/or a year round effluent demand to a use such as TRI Center and/or groundwater replenishment is a sound long-term strategy for TMWRF to reduce nitrogen loading to the Truckee River.

Exceptional Quality Reclaimed Water Feasibility Study

The Team is jointly developing a feasibility study to evaluate whether the State of Nevada's proposed "exceptional quality" standard for reclaimed water offers regional long-range water supply resiliency benefits. Criteria for exceptional quality reclaimed water, achieved through a series of advanced water treatment and natural processes, are included in proposed draft State regulations to permit the use of reclaimed water for groundwater augmentation. The Team envisions a 5-year feasibility study that consists of multiple elements including social,

environmental and financial analyses, regulatory compliance, public engagement, advanced treatment pilot testing, geotechnical investigations, and field scale treatment demonstration projects.

A growing number of national and international communities have developed advanced-treatment reclaimed water projects as an efficient use of water resources. Projects defer expenditures on future water importation projects, provide a local drought proof water supply, and provide for a more resilient total water management strategy. Within the water sector, projects using advanced treatment for reclaimed water are typically referred to as potable reuse projects. While the Team seeks to develop a more comprehensive assessment through a demonstration-scale groundwater replenishment project, there is no current plan to augment local potable water supplies at full scale. A panel of international water reuse experts is guiding the Team's feasibility phase activities.

The advanced water treatment investigations would be conducted over the next 3 to 4 years, led by researchers at University of Nevada, Reno (UNR). UNR will develop the technological justification for selecting the advanced water treatment systems; establish the field scale demonstration project design basis and testing plan; assist acquiring the necessary water treatment equipment; assist during the installation of the demonstration project; conduct startup of the treatment facility, optimizing the treatment unit processes; perform monitoring and testing of the operating strategies, process control, and performance parameters during steady state operations; analyze data, and prepare a final report.

Technological options considered for advanced treatment of reclaimed water to meet drinking water standards include a reverse-osmosis (RO) based treatment train and a biological filtration based treatment train. The former has the distinct disadvantage of side-stream RO brine disposal, which is a challenge for inland regions. Therefore, to meet the study goals, the reclaimed water will be further treated through a series of advanced water treatment and natural processes, likely including biological activated carbon ("BAC") filtration, advanced oxidation, UV disinfection, and soil aquifer treatment ("SAT"). A further review of the applicability of this treatment compared with other alternatives will be explored during the initial stages of this project.

Advanced water treatment technology has been studied locally in the recent past. From 2008-2010 the City of Reno supported WateReuse Research Foundation Project 08-04 to investigate Ozone – Biological Activated Carbon (O3-BAC) as an advanced water treatment alternative to reverse osmosis. The results demonstrated O3-BAC as a viable method for potable reuse. Presently, the regional agencies are supporting WateReuse Research Foundation Project 15-10, which is intended to look more closely at optimal O3-BAC operating conditions. Following an approximately 6 month project scoping and review phase that began in January 2016, it is envisioned that pilot operation will occur over a 9-12 month period. WRRF 15-10 project is being jointly funded by WRRF, American Water, and Stantec Consulting. The pilot unit will be located at the South Truckee Meadows Water Reclamation Facility.

Expert Panel

A panel of international water reuse experts (the "Panel"), managed by the National Water Research Institute ("NWRI") with general guidance from the Team is helping to develop feasibility phase goals and a work plan, providing critical review concerning work progress and making regular recommendations. Jeff Mosher, NWRI Executive Director, an established

potable water expert, is the primary point of contact. The Panel is comprised of members with expertise in all aspects of potable reuse project implementation, including regulatory, public heath, public engagement, advanced water treatment technologies, and groundwater hydrogeology. Panel members are also helping to craft an opportunity statement unique to the Truckee Meadows to help align the feasibility phase activities and more clearly articulate the project purpose to policy makers and the community.

The Panel will be supported by an advisory committee comprised of state and local public health, planning, regulatory, and water utility agencies. The following organizations have been identified as likely advisory committee participants:

- Nevada Division of Environmental Protection
- Nevada State Health Division
- Northern Nevada Water Planning Commission
- City of Reno
- City of Sparks
- Truckee Meadows Water Authority
- Truckee Meadows Water Reclamation Facility
- University of Nevada Reno
- Washoe County Community Services Department
- Washoe County Health District
- Desert Research Institute

Geotechnical Investigations

A main component of the demonstration project is to physically analyze aquifer recharge potential through either an infiltration basin and/or injection wells. Potential sites under consideration include Stead/Lemmon Valley, Cold Springs and Bedell Flat. Classifying hydrogeologic characteristics through groundwater modeling and borehole investigations will assist with sizing the demonstration project advanced treatment units as well as determining the suitability of aquifer recharge at each potential site.

~~High-level plans for wastewater infrastructure improvements envisioned to provide for the needs of the Planning Area's service providers to the year 2030 are included in two documents completed in late 2007 and early 2008: the *City of Reno and Washoe County TMSA/FSA Water, Wastewater and Flood Management Facility Plan* (ECO:LOGIC, 2007) and the *City of Sparks Conceptual Facility Master Plan* (Stantec, 2008). Together these facility plans comprise the most current comprehensive, regional planning-level compilation available and serve as important sources of information for this chapter. Although not specifically incorporated in this Plan, the utility providers each have facility repair and replacement programs in place to upgrade the existing systems and maintain the integrity of the region's existing water and wastewater infrastructure.~~

~~***4.3.1 North Valleys Planning***~~

~~In 2008, the Northern Nevada Water Planning Commission and the Western Regional Water Commission initiated a collaborative effort among key staff from Reno, Sparks, WCDWR, SVGID and the Truckee Meadows Water Authority ("TMWA") to develop recommended~~

~~solutions to certain water issues in the Planning Area using current water management circumstances in the North Valleys.~~

~~It is important to recognize that the circumstances in the North Valleys that led to this planning effort included a relatively high growth rate, planned water importation and an abundance of undeveloped land uses and zoning. The *2004-2025 Regional Water Plan* anticipated significant growth in the Lemmon Valley area, as a result of approved population growth forecasts and Regional Plan designations of a Transportation Oriented Development Corridor and a Regional Center for the Stead area.~~

~~At that time, a federal environmental impact statement ("EIS") was in review for two proposed projects to import approximately 11,500 af of potable water to the North Valleys from groundwater sources further north in Washoe County. Water purveyors in Lemmon Valley include TMWA and WCDWR with SVGID immediately to the east. Water importation facilities were planned to terminate closest to WCDWR infrastructure. Reno and Washoe County were evaluating build-out wastewater collection, treatment and disposal facilities from the perspective of an integrated system within the Lemmon Valley and Stead area. Reno, planning to provide wastewater services for new growth, was engaged in final design for RSWRF improvements to increase treatment and disposal capacity to 2.0 MGD, with specific improvements sized to accommodate flows up to 4.0 MGD.~~

~~Constraints on wastewater effluent discharge to Swan Lake and effluent reuse led to the conclusion that any new potable water source brought into the Stead-Lemmon Valley area that increased wastewater flow to the RSWRF above 2.0 MGD would require additional effluent management techniques, such as exportation from the hydrographic basin or irrigation reuse with significant off-season storage. One of the lower cost alternatives appeared to be exportation of effluent from the basin, however this option brought up issues regarding efficient use of water resources and possibly missing an opportunity to expand the total available resources in the basin.~~

~~These water, wastewater and reclaimed water issues in the North Valleys were selected as a representative example of significant multi-jurisdictional concerns to be addressed through a collaborative process, referred to as the North Valleys Initiative ("NVI"). The recommended solutions and lessons learned from this process can be applied to other similar regional water management issues within the Planning Area.~~

~~ECO:LOGIC (2007) estimated that future wastewater flows from Stead and Lemmon Valley could eventually reach as much as 8,000 af per year ("afa"), based on the long-term development potential. The Swan Lake wetlands and playa can benefit from more water, and an agreement has been reached with the Swan Lake Advisory Committee and NDEP to allow as much as 2,240 afa to be released to the playa in the future. This is the maximum amount of water that the wetlands and playa can accommodate. More water could disrupt the natural wetland and playa processes and increase potential 100-year flood hazards for surrounding properties. Other means to reuse or dispose of the reclaimed water will be needed.~~

~~Cold Springs is in a similar situation. Currently, the reclaimed water from CSWRF percolates into the groundwater through a series of infiltration basins. The amount of water the basins can infiltrate is limited; therefore, the disposal capacity will not be sufficient for the projected future~~

flows. Because of their proximity and similarities concerning water supply and wastewater disposal, NVI considered Stead, Lemmon Valley and Cold Springs as one planning area.

A number of alternatives for reusing and/or disposing of treated wastewater effluent have been evaluated in the past. For instance, plans have been developed to expand the reclaimed water distribution system in the Stead area to include existing and future commercial irrigation demands. Future irrigation demands could require hundreds of additional af of reclaimed water per year. Some additional reuse and disposal alternatives allowed under current NDEP regulations and policies include:

- Create beneficial year-round wetlands at the White Lake playa, similar to what has been developed as a park and wildlife viewing area at Swan Lake
- Export to Long Valley Creek in California, which could provide an outlet during the non-irrigation season or other periods when not all of the reclaimed water generated in the area can be placed to beneficial use
- Export to other areas such as Bedell Flat or Warm Springs
- Considering these alternatives, the NVI team developed other options that would make better use of the reclaimed water resource. In general, potential water resource benefits could include water supply reliability for both municipal and domestic wells, a new source of water to help meet water rights and water quality obligations, and more water available for the environment.

Research of reclaimed water uses throughout the United States showed that numerous states, including California, Arizona, Washington and Idaho, allow reclaimed water use for residential landscape irrigation. Most notably, the award-winning community of Serrano, in El Dorado Hills, California, has been successfully using reclaimed water to irrigate both front and back yard landscaping throughout the development for ten years.

Citizens locally are already familiar with the reclaimed water irrigation systems in widespread use today in the South Truckee Meadows and Sparks. These systems are used to supply irrigation water to schools, parks and landscape medians. In Nevada however, NDEP does not permit the use of reclaimed water for residential homes and is not officially considering a change in this position. One reason is that Nevada's current reclaimed water regulations do not provide for the same level of treatment and reliability as required in states that allow residential landscape irrigation. To allow reclaimed water use for residential irrigation, changes to the regulations would be necessary, as would improvements at the wastewater reclamation facilities to provide the necessary high quality water.

Another use of reclaimed water in other states is groundwater recharge. California, Arizona, Texas and Florida are leading the way in advancing technologies and regulations to expand this practice. Groundwater recharge is being performed for a number of reasons, such as to form a water quality or sea water intrusion barrier, to bolster declining groundwater levels due to over-pumping, and to augment potable water supplies, referred to as indirect potable reuse ("IPR"). The Orange County Groundwater Replenishment System in California is the best example of a large-scale reclaimed water groundwater recharge project implemented in the United States. The following excerpt is taken from the Overview section of the Groundwater Replenishment System website (www.gwrsystem.com):

The Groundwater Replenishment System has evolved and changed over time as new goals, data, regulations and facts have been identified. However, the needs and benefits of the project have remained constant:

- Orange County needs more reliable, high-quality water in the future to replenish the groundwater basin, to protect the groundwater basin from seawater intrusion, and for industrial uses.
- The Groundwater Replenishment System decreases Orange County's reliance on imported water from northern California and the Colorado River.
- The Groundwater Replenishment System's locally-controlled water helps drought-proof Orange County.
- The Groundwater Replenishment System helps reduce mineral build up in Orange County's groundwater by providing a new source of ultra-pure water to blend with other sources, including imported water.

Many of these benefits, and others, could be realized locally with additional uses of reclaimed water. Residential landscape irrigation could play a significant role in meeting future water supply requirements. Highly treated reclaimed water could be used as an economic development incentive to attract specialized water intensive industries to commercial and industrial properties. Reclaimed water could be used to enhance existing wetlands, develop new ones, and help maintain important wildlife habitat. Groundwater replenishment could also be implemented with purified reclaimed water in a technically and environmentally sound manner that would enhance the sustainability of the region's water supplies.

These new uses of reclaimed water would require regional coordination and cooperation among local governments, water and wastewater service providers, regulatory entities and other stakeholders. With appropriate treatment, regulatory oversight and public engagement in the decision-making process, reclaimed water resources could be used to help provide watershed sustainability.

Reno's Advanced Treatment Pilot Test: In addition to the NVI process, an ongoing advanced treatment pilot study at RSWRF has been undertaken by Reno and ECO:LOGIC Engineering. Consideration of groundwater replenishment and IPR using highly treated municipal wastewater effluent must include demonstration of safe, reliable water quality, practicality, affordability and public acceptance. Coastal communities such as Orange County, California utilize reverse osmosis ("RO"), high-energy ultraviolet ("UV") and peroxide treatment because RO brine disposal to the ocean is available. This approach may be neither affordable nor appropriate for many inland areas such as the Truckee Meadows.

To address the feasibility of IPR without RO, Reno developed an alternative treatment demonstration project for public review and regulatory evaluation using either sand filtration or membrane filtration ("MF"), ozonation ("O3"), and biologically activated carbon ("BAC"). Reno's pilot project successfully demonstrated the ability to produce a water quality that meets or exceeds all drinking water regulations, and reduces many non-regulated compounds to very low or non-detect concentrations without increasing the corrosivity of the water (ECO:LOGIC, 2009).

Compared to RO-high energy UV systems, Reno's MF-O3-BAC process has the benefits of multi-barrier treatment for all major categories of contaminants of concern, which provides

additional reliability; lower capital costs; lower operation and maintenance ("O/M") costs and simpler O/M tasks; lower energy use because of the high energy demand of RO; and eliminates treatment and disposal of process reject water.

Regulatory Collaboration: A number of specific activities and workshops were conducted for the benefit of NDEP and WCDHD. CH2MHill was hired to meet independently with regulators from NDEP and WCDHD to obtain feedback regarding the implementation of expanded reclaimed water uses. Possible changes to the existing Nevada Administrative Code ("NAC") and/or Nevada Revised Statutes ("NRS"), proposed public education and input programs, and additional studies relative to health impacts and reuse options were the primary take-home messages from these interviews.

NDEP also initiated discussions with the WCDHD concerning the potential use of reclaimed water for residential use. Issues being discussed will be addressed through NDEP's permitting process of wastewater treatment facilities and include appropriate effluent limitations, treatment reliability standards, as well as compliance points and assurances. Additionally, NDEP would need to seek a change to NAC 445A to include higher water quality standards and treatment requirements. Assuming regulatory changes were completed, a service provider would need to request a modification of its permit. NDEP does not regulate, nor does it have the authority to regulate, a residential reclaimed water program; therefore, the County or other local government would have to be the primary regulatory agency. All of these issues will need to be resolved prior to any future decision on residential reuse.

Cost of Service Evaluation: A planning level evaluation of the various costs of three disposal or reuse scenarios was also conducted. The evaluation considered the cost implications of both water supply and wastewater disposal for three scenarios. Each scenario considered RSWRF's next 2-MGD expansion for wastewater treatment and disposal. Scenario 1 is representative of the current water management approach; import water to the North Valleys, use it once, treat it and dispose of it. Discharge of the treated wastewater to Long Valley Creek was selected as a representative disposal alternative to evaluate this scenario.

Scenario 2 represents expansion of existing reclaimed water uses by incorporating front and back yard residential irrigation for new construction. Factors such as added costs for wastewater treatment, dual water systems, reduced water rights, differences in potable water distribution piping and connection fees were taken into consideration. In coordination with the NVI team, Sparks contracted for an outside evaluation by Optimatics, Inc. to evaluate the differences between a conventional water distribution system, and a dual water system where residential irrigation demands were provided by reclaimed water. The evaluation generally concluded that a dual water system costs about twice as much as a conventional system. This result is due to the reclaimed water system requirement for a 10-hour, night-time irrigation period, rather than spreading the demand out more evenly over a 24-hour period. The local fire department's requirement to provide fire flows from the potable system also prevents downsizing the potable system.

Scenario 3 represents one potential IPR scenario, whereby treated wastewater is purified through an advanced treatment process, and recharged to replenish the local aquifer. For cost estimating purposes, Reno's MF-O3-BAC pilot treatment process was utilized, and it was assumed that the water would be recharged on Washoe County property north of the Stead Airport, which is an area generally isolated from municipal and domestic wells.

Conclusions: The NVI team presented the findings from this work to management and director level staff of Reno, Sparks, Washoe County, TMWA and SVGID. Interestingly, based on the available information, the estimated capital costs for water and wastewater service for each of the three scenarios, including water rights, is approximately equal. After reaching this conclusion, the general consensus from the NVI team was, if the region is going to spend the same amount of money for water and wastewater infrastructure, regardless of which disposal or reuse scenario is implemented, the region should make the investment that maximizes the benefits provided by the available water resources.

An additional conclusion was that the feasibility and public perception issues associated with implementing a groundwater recharge option using reclaimed water, impacts the implementation of other forms of reuse. In many cases, groundwater recharge provides the most efficient and productive use of reclaimed water resources. It can also result in higher overall water quality for the region. Past experience in other states, however, has shown that proposals to replenish potable water supplies using reclaimed water can meet resistance despite the compelling benefits that groundwater recharge could provide. Groundwater recharge does not diminish the benefits of other forms of reuse, such as the current practice of non-potable irrigation reuse in specific areas and applications. As stated above, decision-making will require regional coordination and cooperation among local governments, water and wastewater service providers, regulatory entities, other stakeholders and the public.

Much has been learned regarding the use of reclaimed water for residential irrigation and groundwater recharge, and what will be necessary to move forward with implementation of one or both alternatives. Many issues would need to be addressed, depending on what direction the region wants to take in using reclaimed water to help develop and implement sustainable solutions, such as:

- Updating existing or establishing new reuse ordinances
- Addressing public health protection responsibilities
- Recommending and implementing new water rights policies (many potential issues, such as reduced water rights dedication could be an outcome)
- Obtaining local and state regulatory buy-in for expanded use of reclaimed water (residential irrigation/storage options/aquifer storage and recovery ("ASR")/IPR)
- Recommending and implementing more consistent reclaimed water rate structures (connection and O/M fees)
- Addressing technical challenges (storage options, effluent management plans, cross-connection control, inspection, etc.)
- Recommending administrative roles (i.e., does each utility manage their own system or does one entity oversee the entire reclaimed system?)
- Developing a community outreach program

The NVI process also resulted in a broad realization that reclaimed water is not limited to one product or one type of use. Reclaimed water is a resource that can satisfy multiple purposes where the water quality is tailored to the specific use. Reclaimed water can provide high quality water for people, a healthy economy, and a healthy environment.

~~*4.3.2 Interconnection of Reno-Stead Water Reclamation Facility to Spanish Springs Valley*~~

~~Connecting the RSWRF to the reclaimed water system in Spanish Springs with an intertie pipeline may provide substantial benefits to the community. Sparks has an extensive reclaimed water system, with existing demands approaching 2,000 afa. The City is also looking at serving additional customers, such as the West Pyramid area, which have estimated year-round demands of 750 af. If reclaimed water from RSWRF could be used to meet a portion of these existing and future demands, the displaced water from TMWRF would be available to satisfy additional beneficial uses. For example, the reclaimed water could be recharged in Spanish Springs to help replenish the local aquifer as part of a long-term groundwater management strategy. The RWPC previously determined that the available water rights are out of balance with available groundwater resources in Spanish Springs, and recommended that stakeholders in this basin work together to ensure a comprehensive sustainable management plan for the basin is implemented.~~

~~The displaced water could also be used to provide additional irrigation demands in the Truckee Meadows, such as extension of the reclaimed water system to other areas within Sparks and Reno. The displaced water could also provide increased flows in the Truckee River, as long as the TMWRF discharge permit conditions and wasteload allocations ("WLAs") are satisfied. Alternatively, an intertie pipeline could be used to convey reclaimed water from Sparks to Stead. Operation of the pipeline in this manner could be beneficial to help TMWRF meet discharge permit limitations, or it could provide additional reclaimed water for aquifer storage and recovery in Lemmon Valley or other groundwater basins.~~

~~*4.3.3 Interconnection of Truckee Meadows Water Reclamation Facility to South Truckee Meadows Water Reclamation Facility*~~

~~A reclaimed water intertie pipeline, which would interconnect TMWRF and STMWRF via Huffaker Reservoir, is another alternative that has the potential to provide regional benefits. The TMWRF supply would provide additional seasonal irrigation water to the South Truckee Meadows that would facilitate the earlier conversion of tributary creek water currently used for irrigation to potable supplies.~~

~~The interconnection could also provide a potential short-term solution to help TMWRF meet discharge limitations to the Truckee River. For instance, as the TMWRF service area continues to develop, reclaimed water in excess of the permit limit could be sent to Huffaker Reservoir. In this case, the excess flow could be used for irrigation in the summer months and stored in the winter months. The winter storage volume could either be used for the next year's irrigation season or returned to TMWRF and discharged to the Truckee River during low effluent flow periods. An integrated water balance of existing and future TMWRF and STMWRF flows, discharges, reclaimed water demands and storage is needed to determine the feasibility of this alternative.~~

~~*4.3.4 Decommissioning of the Gold Ranch Wastewater Treatment Facility*~~

~~The Gold Ranch Wastewater Treatment Facility is a small privately-owned extended aeration activated sludge treatment facility utilizing ON/OFF aeration. It has a rated capacity of 25,000~~

~~gallons per day ("GPD") and currently processes 10,000 GPD serving the Gold Ranch tourist commercial property near the California – Nevada border. Effluent disposal is via a leach field system.~~

~~Reno and Washoe County have taken a proactive approach in developing plans to identify possible pollutant loading to the Truckee River within the Verdi area. A general consensus has been to plan for facilities that will remove the major wastewater contributions from this area and sewer to TMWRF. In 2001, Washoe County received federal grant funds and moved forward with the extension of the Lawton/Verdi Interceptor. The Boomtown and Verdi Meadows areas were connected to the interceptor, and their respective wastewater treatment facilities have been decommissioned. The interceptor will also allow for removal of numerous septic systems, and the future decommissioning of the Gold Ranch Wastewater Treatment Plant. This facility's discharge permit contains a condition requiring it to be abandoned when the Lawton/Verdi Interceptor is available.~~