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Section 6 - Stead and Lemmon Valley TMSA

6.1 STUDY AREA DESCRIPTION AND DEVELOPMENT CONSTRAINTS

The Stead / Lemmon Valley TMSA is shown on Figure 6-1 (see figures at end of section) and includes areas within the jurisdiction of both the City of Reno and Washoe County. There are two hydrobasins covering this area that are known as West and East Lemmon Valley. Surface runoff within the West Lemmon Valley basin drains to the Silver Lake playa. Surface runoff within the East Lemmon Valley basin drains to the Swan Lake playa. The TMSA is complex from the perspective of whether particular areas are under the jurisdiction of either the City of Reno or Washoe County, who the water and wastewater purveyors are, and who has responsibility for stormwater and floodplain management. Additionally, there is the Swan Lake Advisory Board that has responsibility for planning and management of the Swan Lake playa and surrounding public open space.

The City of Reno portion of the TMSA generally includes the central portion of the TMSA known as Stead and the North Virginia Corridor. Included within this area are the Reno-Stead Regional Airport Center, the North Virginia Transit Oriented Development Corridor (TOD), and a significant amount of existing and proposed future residential, commercial, and industrial development.

As mentioned in Section 1, the land use basis for facility planning was Traffic Analysis Zone (TAZ) data provided by the City of Reno and Washoe County, with supplemental information derived from the City's Master Plan and Washoe County planned land uses. These data were modified with more detailed information provided by the University of Nevada, Reno (UNR) Small Business Development Center and developer's representatives. TAZ identifications where more current information was incorporated are listed in Table 6.1 and shown in Figure 6-A1 (Appendix A).

Table 6.1 - TAZ Data Modification

TAZ	Modification
399	Used water demands from the North Valley Water Supply Comparison report
405	Modified dwelling units from UNR approved unbuilt data
408	Modified dwelling units from UNR approved unbuilt data
631	Modified dwelling units from UNR approved unbuilt data
634	Modified dwelling units from UNR approved unbuilt data
688	Modified dwelling units from UNR approved unbuilt data
806	Modified dwelling units using Wallach IX planning data

Areas that are limited or constrained for future development include the Reno-Stead Airport, Silver Lake playa, Swan Lake playa, floodplains, and areas with slopes greater than thirty percent. These areas are shown on Figure 6-2.

6.2 CONCLUSIONS AND SUMMARY RECOMMENDATIONS

Insufficient water resources exist to serve the projected 2030 demands in Stead and Lemmon Valley, when potential demands for Cold Springs are taken into consideration. The projected increase in demand is approximately 18,580 AF, compared to the potentially available water resources of 11,909 AF. Expanded use of reclaimed water, such as front and back yard residential landscape watering, should be implemented where reasonable to extend available water supplies and help fulfill the development potential within the Reno and County TMSA.

In Stead and Lemmon Valley, an estimated 3,467 AF of new residential irrigation demand may be served by reclaimed water.

The 2030 total projected wastewater treatment plant capacity for the Stead and Lemmon Valley TMSA is approximately 7.2 MGD, including potential septic tank conversion flows. Regional water supply, water reclamation and wastewater disposal should be a coordinated effort for the Stead, Lemmon Valley and Cold Springs TMSA because of their common effluent disposal constraints.

A summary of the estimated water and wastewater costs for the proposed infrastructure is listed in Table 6.2.

Table 6.2 - Infrastructure Costs (a)

Facility Description	Total Cost (\$M)
Water	\$163.5
Wastewater	\$171.1

(a) 20 Cities ENRCCI = 7,942 May 2007

6.3 DESCRIPTION OF SERVICE PROVIDERS

The water and wastewater service providers are described in the following sections.

6.3.1 Water

The Stead / Lemmon Valley area is served by two water purveyors, Truckee Meadows Water Authority (TMWA) and Washoe County. Initially, the City of Reno portions of Stead were entirely served by TMWA. Now that the City has expanded its annexation and TMSA, there are portions of the City of Reno that lie within the Washoe County Department of Water Resources

water service area. This complicates matters when describing facilities, service areas, and City/County jurisdictional areas.

TMWA provides water service to existing customers within the majority of Reno's TMSA in Stead. Washoe County is the water purveyor for the remainder of the Stead / Lemmon Valley TMSA, including the portion of Reno's TMSA lying in the northwest portion of the TMSA and the northern portion of the Reno-Stead Airport properties. Figure 6-3 depicts the water purveyor service areas, Reno City limits, and locations of existing domestic wells.

6.3.2 Wastewater

The City of Reno provides wastewater collection, treatment and disposal for Reno's Stead TMSA with wastewater flows being treated at the City's Reno-Stead Water Reclamation Facility (RSWRF). RSWRF is also anticipated to provide service to a significant portion of Washoe County's TMSA within the Lemmon Valley area. Washoe County presently provides wastewater collection, treatment and disposal to existing customers in the Lemmon Valley area at the Lemmon Valley Wastewater Treatment Plant (LVWWTP). Wastewater service for the majority of new development within the County TMSA is anticipated to be provided by expansion of the RSWRF facility. Figure 6-4 depicts the locations of the two wastewater treatment facilities, areas anticipated to be served by these facilities, and the locations of existing parcels with septic tanks.

6.4 STATUS OF INFRASTRUCTURE PLANNING

The Stead and Lemmon Valley TMSA is poised for development with the implementation of new water supply projects for the area and the expansion of the RSWRF.

Historically, development within the area has been limited due to a lack of available water supplies. The TMWA service capability has been limited by the available capacity of the Stead Main, which supplies water to Stead from the Central Truckee Meadows. Additionally, groundwater resources within the TMWA and Washoe County water systems have been fully allocated.

Vidler Water Company is constructing the Fish Springs Water Supply Project, and TMWA is constructing the North Virginia / Stead Pumping System Improvements. With these two water supply projects, and the Intermountain Water Supply project also under development, over 10,000 AF of new water supplies will be available to support development within the Reno and Washoe County TMSA.

With the implementation of these water supply projects underway, Reno has expanded the capacity of the RSWRF. Present capacity is 2.35 MGD, with improvements to further increase capacity to 3.25 MGD under design. Washoe County currently has no plans to expand the LVWWTP, but it will be maintained in operation for the foreseeable future to serve existing customers in Lemmon Valley. Because the Stead and Lemmon Valley area is a closed basin, disposal of the treated wastewater is a challenge. Presently, treated wastewater is reused for

irrigation of parks, a golf course and open spaces, and is supplied to Swan Lake to enhance wetland habitat. As the need for additional wastewater disposal capacity increases, plans are to provide a small amount of additional reclaimed water to the Swan Lake wetlands, and expand the use of reclaimed water for proposed water features and landscape irrigation within new developments. Implementation of other disposal options, such as rapid infiltration basins or export to other basins such as Bedell Flat and Long Valley Creek, are also under investigation. These other disposal options are necessary to manage the overall water resources of the area, taking into consideration water supply, wastewater treatment and disposal, and flood control.

Stormwater management and flood control are also very important considerations that affect water and wastewater issues in the Stead and Lemmon Valley TMSA. Geographically, the areas lie within a closed basin, so precipitation and runoff stays within the basin. Presently, stormwater runoff is routed to Swan Lake and Silver Lake. Since there is very little percolation from these playa lakes, the water persists for several months or seasons until it evaporates. Each of these lakes has established FEMA 100-year flood elevations. Recent planning work indicates that more severe flooding may occur at Silver Lake than identified by the current flood elevation. Furthermore, additional runoff resulting from development in the Swan Lake watershed will need to be mitigated to prevent an increase in the flood elevation. Stormwater management and flood control are discussed in Section 14.

The most recent facility plans for water and wastewater are listed in Table 6.3.

Table 6.3 - Recent Facility Plans

Plan Name	Date	Description
Water		
North Valley Water Supply Comparison Reference: ECO:LOGIC	Oct. 2002	Detailed analysis of water supply alternatives that will support the build-out land uses in the Stead, Lemmon Valley, and Cold Springs regions of Washoe County.
North Valley Water Facility Plan Update Reference: ECO:LOGIC	Jan. 2007	Identification of the backbone water infrastructure that would be required to serve new development once new water resources from the Fish Springs Water Supply Project and Intermountain Water Supply Project become available.
North Virginia Stead Pumping System Improvements Reference: ECO:LOGIC	Sept. 2005	Evaluate design options and develop the proposed design criteria for the pump station, pipeline and tank to replace the Stead Main and North Virginia pump zone facilities.
Fish Springs Ranch Facility Plan Reference: ECO:LOGIC	Sept. 2005	Construction of the Fish Springs Water Supply Project to meet future water demands for the Stead, Silver Lake and Lemmon Valley area (North Valleys) within the Truckee Meadows Services Area. The project consists of a new electrical substation off of the Alturas Transmission Line, groundwater production wells, a pump station, a transmission pipeline and terminal water storage tank to convey water from Fish Springs Ranch to the North Valleys. The facilities will be sized to supply 8,000 AF of water per year (AFA).

2005-2025 Water Facility Plan Reference: TMWA	Dec. 2004	Describes the necessary water distribution and treated water storage facilities to meet the forecasted demands and resource optimization goals in the 2025 water resource plan.
Wastewater		
North Valley Effluent Disposal Options Reference: ECO:LOGIC	Sept. 2005	Evaluation of effluent disposal strategies in the North Valleys.
Reno Stead Wastewater Reclamation Facility Expansion Design Report Reference: ECO:LOGIC	April 2004	Provide the necessary additional capacity, unit process redundancy and other improvements required to reliably treat wastewater generated in the planning area in order to accommodate growth, improve treatment flexibility, and provide process redundancy.
Regional Water Master Plan Amendment-Disposal Options Reference: ECO:LOGIC	July 2006	This Amendment sets forth the objectives and strategy to address wastewater disposal planning for the Stead / Lemmon Valley area.
Draft Washoe County 208 Water Quality Plan Version 3 Reference: Truckee Meadows Regional Planning Agency	January 2007	Per section 208 of the Clean Water Act this report provides the planning and management of all sources of water pollution and defines the parameters for area-wide wastewater management plans.

6.5 WATER

The projected water demands and required infrastructure are developed in this section.

6.5.1 Assumptions, Planning Criteria, and Methodology

Water demand factors used to generate demand are based on TMWA design standards for both the TMWA and County areas. The TMWA Rule 7 demand factors are also relevant to the County because new development will dedicate water resources in accordance with TMWA water rights dedication policies.

In the case of non-residential development, the demand factor used represents an average number for planning purposes only. When TMWA or Washoe County receives a request for water service on a non-residential property, the actual water rights dedication requirement will be based on a project-specific analysis of the number of fixture units and the specific landscaping plan. This level of detail is not available for this analysis.

6.5.2 Existing and Future Water Demand

Estimated water demands for Reno and the County are listed in Table 6.4, and are based on data provided by the County and TMWA. The demand estimates are approximate and are representative of typical demands that could be expected without the influence of seasonally cool/wet or hot/dry periods that tend to skew the historical record.

Table 6.4 - Existing Water Demands

	Estimated Demand (AFA)
City of Reno	4,035
Washoe County	791

Based on the TAZ analysis, projected water demands for Reno and the County are listed in Table 6.5 and Table 6.6, respectively. The irrigation demand component is projected assuming that 6,000 gallons per month of water is consumed within a typical house, and the remainder is used for irrigation. The irrigation demand range is based on front yard only irrigation, and the combined front and back yard irrigation. Irrigation demand was not estimated for commercial or industrial use because there is no projection available for the amount of new commercial and industrial acreage that will be built by 2030. The total demands include both indoor and outdoor water use. The projected increase in demand is an approximation based upon the difference between the total demand minus the estimated demand reported in Table 6.4.

Table 6.5 - City of Reno Water Demands (a)

Condition	Irrigation Demand Component (AFA)	Total Demand Including Irrigation (AFA)	Projected Increase in Demand (a) (AFA)
2030 (b)	660-1,320	8,277	4,242
2095 (c)		13,417	9,382

- (a) Based on TAZ analysis, minus estimated demands from Table 6.4.
- (b) Based on 12,716 dwelling units and 2,199 acres of commercial and industrial land use.
- (c) Based on 23,084 dwelling units and 2,199 acres of commercial and industrial land use.

The water rights/demands associated with the potential for intensified development within the Reno-Stead Regional Airport Center and North Virginia TOD were compared to the overall demand for the Stead / Lemmon Valley TMSA. Of the 2030 City of Reno water rights requirement, approximately 3,560 AFA or 43 percent is estimated to be within the TOD and Center area. This includes new demands, and potential redevelopment of existing properties.

Table 6.6 - Washoe County Water Demands

Condition	Irrigation Demand Component (AFA) (b)	Total Demand Including Irrigation (AFA) (b)	Projected Increase in Demand (a) (AFA)
2030	1,074- 2,147	6,900	6,109

- (a) Based on TAZ analysis, minus estimated demands from Table 6.4.
- (b) Based on 12, 241 dwelling units and 92 acres of commercial and industrial land use.

An estimate of water demands associated with domestic wells is listed in Table 6.7 for Reno and the County. In the TAZ analysis, existing houses were analyzed the same way whether the house

has a domestic well, or not. The flows projected in Tables 6.5 and 6.6 include demands from houses with an existing well.

Table 6.7 - Domestic Well Demands

	Number of Domestic Wells	Domestic Well Demands (AFA) (a)
Reno	151	169
County	1,217	1,363
Total	1,368	1,532

(a) Domestic well conversion based on 1.12 AFA per well

6.5.3 Water Resources

Existing water resources available to the Stead and Lemmon Valley area include Truckee Meadows surface and groundwater delivered by TMWA through the Stead Main, and local groundwater resources. The North Virginia / Stead Pumping System Improvement Project will increase supply capacity to the City of Reno TMSA. As part of this project, TMWA is also providing a new 990 gpm wholesale water supply to Washoe County for its TMSA in the Lemmon Valley and Golden Valley areas. It is anticipated that this water supply project will provide new development with approximately 200 to 400 AFA within the TMWA service area, and 400 to 500 AFA for Washoe County.

The Fish Springs Water Supply Project will provide 8,000 AF of new water per year for development. The water will be delivered to the northeast portion of Lemmon Valley, and will be available for use in early 2008 within both the City of Reno and Washoe County TMSA in Stead and Lemmon Valley. Additional water resources from the Intermountain Water Supply Project may also become available in the near future. The project has received permitting approvals from the BLM and Washoe County, and could be implemented within a one year time frame once all construction related approvals have been obtained.

Substantial amounts of reclaimed water, up to 8,065 AFA, could also become available from RSWRF as new development generates additional wastewater flows. This high quality reclaimed water is suitable for landscape irrigation, including residential areas, and could be used to extend the available potable water supplies. Landscape irrigation accounts for approximately half of the total water demand for a typical residential unit. Water demands could be further reduced by implementing water conserving landscaping practices and/or xeriscaping.

Existing and potentially available water resources to serve both the City of Reno and Washoe County TMSA in the Stead and Lemmon Valley area are presented in Table 6.8.

Table 6.8 - Potentially Available Water Resources

Source Description	Supply (AFA)
Existing Resources	
TMWA Truckee Meadows Surface / Non-Stead Groundwater	3,265 (a)
TMWA Stead Groundwater	770
Washoe County Groundwater	1,258
Reclaimed Water	(b)
Total	5,293
Future Resources	
TMWA Truckee Meadows Surface / Groundwater	750 (c)
Remaining Groundwater Rights from Golf Course	172
Fish Springs Water Supply Project	8,000 (d)
Intermountain Water Supply Project	2,000 (d)
Total	10,922

(a) Approximation of existing utilization of committed water resources.

(b) Reclaimed water may be used to supplement water resources for non-potable uses.

(c) TMWA supply is intended for use only in areas with a return flow to the Truckee River.

(d) Water resources potentially available to Stead, Lemmon Valley, Cold Springs and Spring Mountain.

A comparison of the existing and future resources, water demand for existing conditions and the potential 2030 demand is shown in Table 6.9. The total demand estimate includes potential water requirements of 1,532 AF for domestic wells. The estimated need for additional water resources for the Reno and Washoe County TMSA is approximately 4,192 AFA and 6,109 AFA, respectively, for a total need of 10,301 AF. This compares favorably with the potentially available water resources of 10,922 AF.

Table 6.9 - Water Demand and Resources Comparison

Condition	Supply (AFA)	City of Reno Demand (AFA)	County Demand (AFA)	Total Demand (AFA)
Existing	5,293	4,035	791	4,826
2030	16,215	8,227	6,900	15,127
Net Increase	10,922 (a)	4,192	6,109	10,301

(a) 10,000 AF of water resources potentially available and shared between Stead, Lemmon Valley, Cold Springs and Spring Mountain TMSA.

However, interest has been expressed in use of a portion of the 10,000 AF from the Fish Springs and Intermountain water resources in areas outside of Stead and Lemmon Valley, including the TMSA in Cold Springs and Spring Mountain. Changes to the Place of Use for the water rights would need to be filed and approved by the State Engineer. If approved, the demand for potable water supplies for these areas will significantly exceed the available supplies from the Fish

Springs and Intermountain projects. Expanded uses for reclaimed water, such as front and back yard residential landscape watering, will be needed to help fulfill the development potential within the Reno and County TMSA.

6.5.4 Planned Water Facilities

Both TMWA and the County have recently prepared water facility plans for their systems in the Stead / Lemmon Valley area that identify the required improvements to accommodate growth and remediate existing system deficiencies in their service territories.

Proposed additional improvements to serve the Reno and County TMSA lie within the Washoe County Department of Water Resources service territory and have been integrated with the County's previous water facility plan. No further planning within TMWA's service territory was conducted. A summary of TMWA's planned facility improvements for the Stead area is presented in Table 6.10 and shown graphically in Figure 6-B3 (Appendix B). The source of this information is TMWA's 2025 Water Facility Plan.

Backbone distribution system facilities are planned that supply a maximum day demand of 16,750 gpm to meet projected growth in the Lemmon Valley, Stead Airport, Silver Knolls, North Virginia Corridor and portions of the Cold Springs regions. These regions, with the exception of Cold Springs, generally comprise the Stead and Lemmon Valley TMSA. These facilities convey the currently available resource while satisfying design criteria. It is important to note that certain transmission facilities for the Stead and Lemmon Valley TMSA have capacity sized to provide water supplies to the Cold Springs TMSA.

A high pressure backbone transmission main is planned that serves all but the highest reaches of the Stead / Lemmon Valley TMSA. The hydraulic grade of the transmission main is 5,311 feet, established by the proposed Intermountain and East Lemmon Tank elevations (see Figure 6-5). Two pump stations are planned that serve higher elevations in the Silver Knolls and Horizon Hills areas. Maximum pressures in the transmission main are approximately 170 psi. The high pressure backbone main has cost and operational advantages when compared to a conventional pressure transmission main. Results of a planning level cost analysis indicate a capital cost savings with a high pressure main of around \$16 million. Lower capital (and O&M) costs are primarily due to fewer required pump stations and storage tanks.

All existing and proposed wells are located on the east side of Silver Lake in the Lemmon Valley region. Well locations are presented in Figure 6-5. The proposed wells will need to be constructed when the imported water capacity approaches its full maximum day allocation. The peaking capacity of several of the existing wells will also need to be increased to meet maximum day demands. However, annual groundwater usage will not increase as additional supplies will be brought into the North Valleys area. A summary of the recommended TMSA facilities is presented in Table 6.10 and illustrated in Figure 6-5. Water system pressure zones are shown in Figure 6-B1 (Appendix B).

Table 6.10 - Water Facility Totals

TMSA Facilities	
Facility	Qty
Total Length of proposed Transmission Mains	173,300 FT
Total number of Pump Stations	2
Total number of Tanks	7
Total Storage Volume	7.67 MG
Total number of wells	3 new, 2 retrofitted
TMWA Facilities (per TMWA 2025 WFP) (a)	
Total Length of proposed Transmission Mains	27,200
Well Improvements	1

(a) Planned improvements are from TMWA's Water Facility Plan, as of December 2004.

Fire flows available to the Stead / Lemmon Valley TODs were evaluated. These corridors are along Virginia Street in the Horizon Hills area and Stead Boulevard. With the planned improvements in the Horizon Hills area, there will be 4,000 gpm of available fire flow. According to planning personnel from TMWA, the current available fire flow along Stead Boulevard is approximately 2,000 gpm.

6.5.5 Water Facility Cost Estimates

The estimated costs of the planned water infrastructure for Stead / Lemmon Valley TMSA are summarized in Table 6.11, and are listed in more detail in Stead section of Appendix B.

Table 6.11 - Water Infrastructure Costs (a)

Facility Description	Total Cost (\$M)	Reno Share of Facility (\$M)	County Share of Facility (\$M)
TMSA Costs (not including TMWA)			
Supply (b)	\$90.2	Not available	Not available
Transmission	\$52.8	\$20.6	\$32.2
Storage	\$13.2	\$5.5	\$7.7
<i>Subtotal</i>	\$156.2	\$26.1	\$39.9
TMWA Costs (per TMWA 2025 WFP) (c)			
Transmission	\$5.3	\$5.3	\$0
Other	\$2.0	\$2.0	\$0
<i>Subtotal</i>	\$7.3	\$7.3	\$0
Total	\$163.5	\$33.4	\$39.9

(a) 20 Cities ENRCCI = 7,942 May 2007

(b) Water rights costs are not included. Supply facility costs are based upon \$82M of the \$100M for Fish Springs and \$22M for Intermountain with the remainder of the cost allocated to the Cold Springs Area. Also included is \$8.168M for North Virginia capacity (based on 4/06 Feeder Main fees).

(c) Planned improvements costs are from TMWA's Water Facility Plan, as of December 2004.

Project divisions for the cost analysis can be found in Figure 6-B2 (Appendix B). Costs of the proposed transmission mains, pump stations and storage tanks were included. Individual pressure reducing stations are not included in the cost estimates, as these facilities are generally considered development specific, on-site improvements. In addition, the costs of purchasing water rights are not included.

The allocation of cost between Reno and the County was proportioned by flow (pipes and pump stations) or volume (tanks).

6.5.6 Water Planning Limitations

Specific limitations of the water facility plan component for the Stead and Lemmon Valley TMSA are listed below.

- The proposed facilities identified in this plan are for serving new growth and not intended to remediate existing system deficiencies.
- Insufficient water resources have been identified to serve the projected 2030 demands in the Stead, Lemmon Valley and Cold Springs areas (projected increase in demand of approximately 18,580 AF, compared to potentially available resources of 11,909 AF). The transmission mains identified are sized to serve these areas based on the potentially available water resources from Table 6.9. If more resources become available to the area, larger transmission mains will be required to satisfy the forecasted 2030 demand.
- The water demand estimate for the Stead TOD and Center was compared between the TAZ analysis estimate and the TMWA model demand estimate. The TMWA model has a slightly higher demand for this area, and therefore the modeled infrastructure is assumed to be adequate for the area. Site specific infrastructure may need to be upsized for higher demands.
- Single backbone mains were used to supply water throughout the TMSA. As development occurs, it is likely that an equivalent transmission capacity will be conveyed by a distribution network rather than by a single backbone main.
- The allocation of cost between Reno and Washoe County is an approximation. Further analysis will be required to determine the appropriate cost allocation for specific facilities.
- Washoe County and TMWA facilities were not integrated in this analysis. Emergency interties between these systems would provide an economical means of increasing system reliability.

6.6 WASTEWATER

The projected wastewater flows and required infrastructure for conveyance, treatment, and disposal are developed in this section.

6.6.1 Assumptions, Planning Criteria, and Methodology

The wastewater flow factor for the Stead area was assumed from the 2007 Washoe County 208 Water Quality Management Plan. The flow factor ranged from a low of 70 gallons per capita per day (gpcd) to 130 gpcd. An average of 100 gpcd was used for flow projection. All other wastewater planning assumptions are as stated in Appendix A.

6.6.2 Existing and Future Wastewater Flow

The 2006 annual average wastewater flows for Reno Stead Water Reclamation Facility and Lemmon Valley Wastewater Treatment Plant are listed in Table 6.12 below.

Table 6.12 - Existing Wastewater Flows (a)

	2006 Annual Average Flows (MGD)
Reno Stead WRF	1.4
Lemmon Valley WWTP	0.25
Total	2.25

(a) Based on 2006 plant flow records.

Using the TAZ data, flow was projected for the Reno and County TMSA. The wastewater treatment plant capacity projections for Reno and Washoe County are presented in Tables 6.13 and 6.14, respectively. Wastewater treatment for the majority of new development within the County TMSA is anticipated to be provided by expansion of the RSWRF facility.

Table 6.13 - City of Reno Wastewater Projections

Condition	Flows (MGD)
2030 (a)	4.45
2095 (b)	6.73

(a) Based on 12,716 dwelling units and 2,199 acres of commercial and industrial land use.

(b) Based on 23,084 dwelling units and 2,199 acres of commercial and industrial land use.

The intensification of wastewater flows in the Stead TOD and Center were compared to the overall flows for the Stead area. Of the City wastewater treatment plant flow, 47 percent is estimated to be produced from areas within a TOD or Center.

Table 6.14 - Washoe County Wastewater Projections

Condition	Flows (MGD)
2030 (a)	2.75

(a) Based on 12,241 dwelling units and 92 acres of commercial and industrial land use.

The 208 Plan has a projected 2030 wastewater flow range of 3.3 MGD to 7.1 MGD for Stead. The 2030 total projected wastewater flow for Stead and Lemmon Valley TMSA is 7.2 MGD.

The potential flow projection for parcels with existing septic tanks that could be connected to the municipal sewer system is listed in Table 6.15. In the TAZ analysis, existing houses were analyzed the same way whether the house has a septic tank or not. The flows projected in Tables 6.13 and 6.14 include potential flows from houses with septic tanks.

Table 6.15 - Septic Tank Conversion Flow Projections

	Number of Septic Tanks	Septic Tank Conversion Flows (MGD) (a)
Reno	129	0.026
County	1819	0.363
Total	1948	0.389

(a) Septic tank conversion based on 200 gpd per septic

6.6.3 Water Reclamation and Disposal

Current plans to increase water reclamation and disposal capacity at the RSWRF include providing additional supplies to the Swan Lake wetlands, up to 2.35 MGD, and expanding the use of reclaimed water. Reclaimed water is proposed for water features and landscape irrigation within several new developments located within both the Reno and Washoe County TMSA. Within Reno, current plans for expansion of the reclaimed water system are proposed along Stead Boulevard and will connect to the existing distribution system near Silver Lake Road and Silver Sky Parkway. Within Washoe County, expansion of the reclaimed water system is proposed to serve the planned developments east of Lemmon Drive. Potentially 3,467 AF of new residential irrigation demand may be served by reclaimed water. Residential reclaimed water irrigation would only be for new development due to the high cost of retrofitting existing residential developments.

Wastewater disposal capacity beyond 2.35 MGD will require implementation of additional water reclamation facilities and disposal options. Additional water reclamation facilities under investigation include an effluent reservoir for non-irrigation season storage in the Silver Knolls vicinity, and potential new uses at the Golden Valley Community Park and the North Valleys High School. Supplemental disposal options include rapid infiltration basins and export to other areas including Bedell Flat and Long Valley Creek.

6.6.4 Planned Wastewater Facilities

Recommendations for future wastewater collection and treatment facilities were developed for 2030 and are shown on Figure 6-6. For each sewer collection area, the projected 2030 flows were compared to the capacity of the existing gravity interceptors. The collection areas are shown on Figure 6-C1 (Appendix C). Existing lift stations and force mains were not analyzed in detail for remaining available capacity. If the existing interceptors or force mains do not have capacity for the 2030 flow, a parallel pipe/facility is recommended. Future detailed design

studies should determine whether replacing the existing pipe or installing a parallel main is the appropriate improvement. Facility sizing methods and calculations are included in Appendix A.

The best available information and status of current planning for regional reclaimed water facilities is shown in Figure 6-7. Regional reclaimed water facilities will likely serve the Stead, Lemmon Valley and Cold Springs TMSA due to their common effluent disposal constraints. Additional reclaimed water distribution facilities will be required that have not been evaluated in this facility plan.

A summary of recommended wastewater collection, treatment, and reclaimed water / disposal infrastructure is summarized in Table 6.16.

Table 6.16 - Summary of Recommended Wastewater Infrastructure

Facility	Units
Interceptors	47,800 feet
Parallel Interceptors	60,100 feet
Force Mains	46,600 feet
Reclaimed Water/Disposal Pipe	75,500 feet
Wastewater Lift Stations	6 stations
Reclaimed Water/Disposal Pump Stations	1 Station
2030 Treatment Capacity for Reno Stead WRF	7.2 MGD
2030 Treatment Capacity for Lemmon Valley WWTP	0.3 MGD
Reclaimed Water Storage Reservoir	3,000 AF

6.6.5 Wastewater Facility Cost Estimates

Wastewater infrastructure costs are summarized in Table 6.17, and are listed in more detail in Appendix C. These facilities are intended to serve new growth, and not to remediate existing system deficiencies.

Table 6.17 - Wastewater Infrastructure Costs (a)

Facility Description	Total Cost (\$M)	Reno Share of Facility (\$M)	County Share of Facility (\$M)
Collection System	\$61.3	\$44.5	\$16.8
Treatment	\$69.5	\$30.1	\$39.4
Disposal/Reclaimed Water	\$40.3	\$17.4	\$22.9
Total	\$171.1	\$92	\$79.1

(a) 20 Cities ENRCCI = 7,942 May 2007

The allocation of cost between Reno and Washoe County was developed from their respective share of the flow for the collection system and treatment facilities. The reclaimed water /

disposal cost includes a reclaimed water system expansion in Stead and shared regional facilities. A detailed breakdown of regional reclaimed water costs between Stead and Cold Springs is located in Appendix C.

6.6.6 Wastewater Planning Limitations

Specific limitations of the wastewater planning in the Stead and Lemmon Valley area are listed below.

- Wastewater flow projections are conservative because a mid-range wastewater flow factor is used. The TMWA Rule 7 water demand projections are representative of actual demands. Therefore, the percentage of wastewater flow compared to the total water demand is more than the “typical” fifty percent reported in previous planning studies.
- The 2004 expansion of the Norton Interceptor was designed for a d/D ratio of 0.7. Analysis of the projected flow and capacity of the Norton Interceptor used this design standard instead of the d/D ratio of 0.5 that was used for the remainder of the pipes. The projected flow in the Norton Interceptor exceeds the projected capacity at a d/D ratio of 0.7. The potential need to expand the capacity of the pipe should be studied as development progresses.
- Effluent disposal planning for the Stead and Lemmon Valley TMSA is conceptual. The best available information for regional reclaimed water facilities has been provided; however, additional facilities and costs will be required to provide disposal capacity for the projected 2030 wastewater flows.
- The effluent disposal strategy will likely consist of a combination of continued disposal to Swan Lake, expanded water reclamation, land disposal to the White Lake playa and discharge to Long Valley Creek.
- The allocation of cost between Reno and Washoe County is an approximation. Further analysis will be required to determine the appropriate cost allocation for specific facilities.

6.7 POLICY RECOMMENDATIONS (INCLUSIVE OF WATER, WASTEWATER)

Potentially available water resources have been identified to serve the projected 2030 demands in the Stead and Lemmon Valley TMSA. However, insufficient water resources are available to satisfy the needs of Cold Springs, which is relying on the same water resources. Expanded use of reclaimed water, such as front and back yard residential landscape watering, should be implemented where reasonable to extend available water supplies and help fulfill the development potential within the Reno and County TMSA. Water demands could be reduced by implementing water conserving landscaping practices and/or xeriscaping. However, water conserving landscape practices should be balanced with the need for disposal of reclaimed water.

Regional water supply, water reclamation and wastewater disposal should be a coordinated effort for the Stead, Lemmon Valley and Cold Springs TMSA because of their common effluent disposal constraints.