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Section 9 - Truckee Meadows TMSA

9.1 STUDY AREA DESCRIPTION AND DEVELOPMENT CONSTRAINTS

The Truckee Meadows TMSA is shown on Figure 9-1 (see figures at end of section) and includes areas within the jurisdiction of both the City of Reno and Washoe County. The Reno portion of the TMSA generally follows the Truckee Meadows Water Reclamation Facility (TMWRF) service area boundary. Several hydrobasins cover the Truckee Meadows area including Truckee Canyon, Truckee Meadows, and a portion of East Lemmon Valley. Surface runoff drains to various drainage ways that end up in the Truckee River. The Truckee Meadows 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.

The Truckee Meadows portion of the TMSA includes several regional centers and transit oriented development corridors (TOD) as shown on Figure 9-1. Regional centers consist of Dandini, UNR, Downtown Reno, Renown, Reno Tahoe International Airport, and the Convention Center. TODs consist of West 4th Street, East 4th Street North Virginia Street, Mill Street, and South Virginia Street.

As mentioned in Section 1, the land use basis for facility planning was Traffic Analysis Zone (TAZ) data provided by both 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 9.1 and shown in Figure 9-A1 (Appendix A).

Table 9.1 - TAZ Data Modification

TAZ	Modification
102	Modified dwelling units from UNR approved unbuilt data
106	Modified dwelling units from UNR approved unbuilt data
115	Modified dwelling units from UNR approved unbuilt data
128	Modified dwelling units from UNR approved unbuilt data
143	Modified dwelling units from UNR approved unbuilt data
275	Modified dwelling units from UNR approved unbuilt data
312	Modified dwelling units from UNR approved unbuilt data
387	Modified dwelling units from UNR approved unbuilt data
391	Modified dwelling units from UNR approved unbuilt data
397	Modified dwelling units from UNR approved unbuilt data
415	Modified dwelling units and commercial acreage using Verdi plan data
416	Modified dwelling units and commercial acreage using Verdi plan data
421	Modified dwelling units from UNR approved unbuilt data

432	Modified dwelling units from UNR approved unbuilt data
435	Modified dwelling units and commercial acreage using Verdi plan data
481	Modified dwelling units from UNR approved unbuilt data
655	Modified dwelling units from UNR approved unbuilt data
690	Modified dwelling units from UNR approved unbuilt data
691	Modified dwelling units from UNR approved unbuilt data
695	Modified dwelling units from UNR approved unbuilt data
703	Modified dwelling units from UNR approved unbuilt data
704	Modified dwelling units from UNR approved unbuilt data
705	Modified dwelling units from UNR approved unbuilt data
781	Modified dwelling units and commercial acreage using Verdi plan data
782	Modified dwelling units and commercial acreage using Verdi plan data
783	Modified dwelling units and commercial acreage using Verdi plan data
784	Modified dwelling units and commercial acreage using Verdi plan data
785	Modified dwelling units and commercial acreage using Verdi plan data
786	Modified dwelling units and commercial acreage using Verdi plan data
787	Modified dwelling units and commercial acreage using Verdi plan data
788	Modified dwelling units and commercial acreage using Verdi plan data
789	Modified dwelling units and commercial acreage using Verdi plan data
790	Modified dwelling units and commercial acreage using Verdi plan data
815	Modified dwelling units from UNR approved unbuilt data

Areas that are limited or constrained for future development include the Reno-Tahoe International Airport, drainage ways, waterbodies, and areas with slopes greater than thirty percent. These areas are shown on Figure 9-2.

9.2 CONCLUSIONS AND SUMMARY RECOMMENDATIONS

The estimated need for additional water resources for the Reno and Washoe County TMSA is approximately 13,760 AFA. This compares favorably with the potentially available water resources of 22,363 AF. However, additional demands will also be placed on these available water resources from other planning areas including Sparks, Spanish Springs and the South Truckee Meadows.

TMWA's 2025 Water Facility Plan is a comprehensive document, therefore, no further detailed planning was necessary within TMWA's retail service territory, other than for Verdi and the Sunny Hills areas.

The projected 2030 wastewater flow for the Truckee Meadows Water Reclamation Facility is 41.3 MGD, not including flow from the City of Sparks, Sun Valley, or Spanish Springs. Reuse and discharge of reclaimed water from the various water reclamation facilities in the region is constrained by a number of factors. A thorough planning and facilities study of regionally integrated reclaimed water systems and management strategies is required to develop a plan to meet the disposal capacity requirements for the projected 2030 wastewater flows. Regionally

integrated reclaimed water systems and management strategies may realize economic and financially prudent alternatives that cannot be realized with separate, independent systems.

A summary of the estimated water and wastewater costs for the proposed infrastructure is listed in Table 9.2

Table 9.2 - Infrastructure Costs

Facility Description	Total Cost (a, b) ($M)
Water	$141.7
Wastewater (c)	$219.0

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

(b) Cost does not include Sunny Hills. This cost will be listed in the South Truckee Meadows Section.

(c) Costs do not address long term reuse and disposal requirements.

9.3 DESCRIPTION OF SERVICE PROVIDERS

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

9.3.1 Water

TMWA provides water service to existing customers within the majority of Reno's TMSA in Truckee Meadows. Washoe County is the water purveyor for the remainder of the Truckee Meadows TMSA. Three small water purveyors exist in the Verdi area including the Boomtown water system, Verdi Meadows Utility Company and Verdi Mutual Water Company. The Boomtown water system serves the hotel/casino, service station, truck stop and RV park. Verdi Meadows Utility Company serves the River Oaks Subdivision. Figure 9-3 depicts the water purveyor service areas, Reno City limits, and locations of existing domestic wells.

The City of Reno has recently annexed approximately 2,700 acres in Verdi (2001). Maximum density and density distribution within the annexation area have been defined as part of a settlement agreement between the City of Reno and Washoe County. Preliminary water facility plans have been developed by TMWA and Capital Engineering that identify the required backbone facilities to deliver water from TMWA's system to the Verdi area. The TMWA supply will be the primary source of water to the Verdi area. Local groundwater will supplement the TMWA supply for peak demands.

9.3.2 Wastewater

The City of Reno provides wastewater collection, treatment and disposal for the Truckee Meadows TMSA with wastewater flows being treated at the regional TMWRF. TMWRF also provides service to Sparks and portions of the Washoe County TMSA. Two wastewater plants in the Verdi area will be decommissioned after being connected to the Lawton Verdi interceptor that conveys wastewater to TMWRF. These plants include the Boomtown Wastewater

Treatment Facility and Gold Ranch Casino. The Verdi Meadows Utility Company (River Oak) plant was connected to the Lawton Verdi interceptor in 2007.

Figure 9-4 depicts the locations of the wastewater treatment facilities, areas anticipated to be served by these facilities, and the locations of existing parcels with septic tanks.

9.4 STATUS OF INFRASTRUCTURE PLANNING

The most recent facility plans for water and wastewater are listed in Table 9.3.

Table 9.3 - Recent Facility Plans

Plan Name	Date	Description
Water		
Preliminary Boomtown/Verdi Area Water Facility Plan (Draft) Reference: Capital Engineering	June 2004	Outlines the required water facility infrastructure to connect the Boomtown and Verdi areas to TMWA's service area.
Mortensen Et. Al. Development Standards Handbook Reference: Summit Engineering Corporation	March 2004	Identifies development standards for properties within the Verdi Settlement agreement.
Memo Titled "Backbone Water Facility Improvements to Supply 3560 GPM to the Verdi/Verdi Area Reference: TMWA	June 2006	Summary of the backbone facilities required to deliver 3560 gpm of maximum day supply to the Verdi area.
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.
Washoe County Regional Water Management Plan Reference: RWPC	Jan. 2005	The plan provides the region with an outline of how water will be managed to meet the needs of the citizens and to the future. Major components of the plan are identification of future water supply and wastewater facilities, regional flood control and drainage projects, and development of a water conservation program.
Wastewater		
Lawton Verdi Wastewater Facility Plan Reference: Stantec	July 2002	Evaluates various wastewater conveyance systems for existing and planned development in the Lawton Verdi area.
Draft Washoe County 208 Water Quality Management 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.
2002 Truckee Meadows Regional Plan Reference: Truckee Meadows Regional Planning Agency	February 2003	A plan for the Truckee Meadows as it relates to land use planning, infrastructure provision, resource management and plan implementation.

9.5 WATER

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

9.5.1 Assumptions, Planning Criteria and Methodology

Water demand factors used to estimate demands are based on TMWA design standards for both the TMWA and County areas. 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.

9.5.2 Existing and Future Water Demand

Estimated water demands for Reno and the County are listed in Table 9.4, and are based on data provided by the County and TMWA. The current estimated weather normalized retail water demand in the Truckee Meadows is 78,120 AFA, with approximately 50,788 AF of the demand attributed to customers in the Reno and Washoe County portions of the Truckee Meadows planning area. It was not possible to accurately differentiate the existing demand between Reno and Washoe County. These estimates are based upon the actual demand experienced in 2006 and adjusted upward by approximately 8 percent to offset the cool wet spring conditions that reduced the observed demand by about 8 percent from the highest demand in the past 5 years.

Table 9.4 - Existing Water Demands

	Estimated Demand (AFA) (a)
City of Reno / Washoe County	50,788

(a) Based on 2006 adjusted demand data.

Based on the TAZ analysis, projected water demands for Reno and the County are listed in Table 9.5. 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, or the combined front and rear 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 2006, 2030 and 2095 TAZ projections.

Table 9.5 - City of Reno and Washoe County Water Demands

Condition	Irrigation Demand Component (AFA)	Total Demand Including Irrigation (AFA)	Projected Increase in Demand (a) (AFA)
2030 City of Reno and Washoe County (b, c)	3,200-6,400	64,548	13,760
City of Reno 2095 (d)		90,713	39,925

(a) Based on TAZ analysis.

(b) Based on 125,303 dwelling units and 5,318 acres of commercial/industrial zone in City of Reno

(c) Based on 6,835 dwelling units and 45 acres of commercial/industrial zone in Washoe County

(d) Based on 221,449 dwelling units and 5,318 acres of commercial/industrial zone in City of Reno

Of the 2030 City of Reno water rights requirement, approximately 28 percent is estimated to be within the TOD and Center area. This includes new demands, and potential redevelopment of existing properties.

An estimate of water demands associated with domestic wells is listed in Table 9.6, 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 Table 9.5 include demands from houses with an existing well.

Table 9.6 - Domestic Well Demands

	Number of Domestic Wells	Domestic Well Demands (AFA) (a)
Reno	469	525
County	961	1076
Total	1,430	1,601

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

9.5.3 Water Resources

Substantial amounts of reclaimed water are potentially available from TMWRF as new development generates additional wastewater flows. However, there is a limit to the amount of reclaimed water that can be utilized without requiring a return flow water right for the Truckee River. Refer to Section 9.6.3 for further discussion on reclaimed water constraints. 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 Truckee Meadows area are presented in Table 9.7. Refer to Appendix B for more detailed information on available water resources.

Table 9.7 - Potentially Available Water Resources

Source Description	Supply (AFA)
Existing Resources	
TMWA Water Rights (a)	102,000
Verdi Area Surface and Groundwater Rights (b)	550
Reclaimed Water	(c)
Total	102,550
Future Resources	
TMWA Water Rights (d)	120,353
Verdi Area Surface and Groundwater Rights	4,560
Total	124,913

(a) Existing commitment level for the entire water system associated with TMWA's decreed municipal rights, storage rights, groundwater rights and main stem Truckee River irrigation rights.

(b) Estimate of existing water resource utilization for M&I purposes within the Verdi area.

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

(d) Future commitment level based on implementation of TROA.

A comparison of the existing and future resources, water demand for the existing conditions and the potential 2030 demand is shown in Table 9.8. The total demand estimate includes potential water requirements of 1,601 AF for domestic wells. The estimated need for additional water resources for the Reno and Washoe County TMSA is approximately 13,760 AFA. This compares favorably with the potentially available water resources of 22,363 AF. However, additional demands will also be placed on these available water resources from other planning areas including Sparks, Spanish Springs and the South Truckee Meadows.

Table 9.8 - Water Demand and Resources Comparison

Condition	Supply (AFA)	Total Demand (AFA)
Existing	102,550	50,788
2030	124,913	64,548
Net Increase	22,363 (a)	13,760

(a) Increase in water supply available to serve new demands in Reno, Sparks and Washoe County

9.5.4 Planned Water Facilities

The majority of the Truckee Meadows area is currently served by TMWA. TMWA's 2025 Water Facility Plan (WFP) identifies the required improvements to accommodate growth and remediate existing system deficiencies within its service territory. The WFP Executive Summary and WFP cost tables can be found in Appendix B. A brief discussion of the proposed major water system facilities and their estimated costs can be found in the executive summary. Greater facility detail is presented in the WFP cost tables that accompany the executive summary including specific facility information, such as estimated in-service date, estimated cost and cost allocation to existing and new development. It is assumed that the information contained within TMWA's WFP is current, even though some planning changes and facility improvements may have occurred. TMWA's 2025 Water Facility Plan is a comprehensive document, therefore, no further detailed planning was necessary for this Facility Plan within TMWA's retail service territory.

Estimated available fire flows to the Truckee Meadows TODs and Regional Centers appear in Table 9.9.

Table 9.9 - Estimated Available Fire for TODs and Regional Centers

No	Area		Description	Available Fire Flow (GPM)(a)	Remarks
1	Stead		Regional Center	TBD	Undeveloped
2	North Virginia Street	Upper	TOD Corridor	2,000	Along Stead Blvd. North of the intersection of US 395 and Stead Blvd.
		Middle		0	No fire hydrants available along N. Virginia from Stead Blvd. to Lemmon Dr.
		Lower		4,000	Along N. Virginia St. South of the intersection of US 395 and Lemmon Dr.
3	South Virginia Street	Upper	TOD Corridor	4,000	Along S. Virginia St. in between Downtown Reno and Convention Center.
		Middle		3,000	Along S. Virginia St. near the Convention Center. Flow can be increased with minor system improvements.
		Lower		TBD	S. Virginia St. flow will be identified in the County TMSA Plan.
4	Dandini		Regional Center	3,000	Recent TMWA improvements have increased flows to 3,000 gpm.
5	UNR		Regional Center	3,000	Recent TMWA improvements have increased flows to 3,000 gpm.

6	Downtown Reno	Downtown Center	4,000 - 5,000	
7	Renown Medical	Regional Center	4,000	
8	East Fourth Street	TOD Corridor	4,000	
9	West Fourth Street	TOD Corridor	2,000 - 3,000	Mains are limited in this area.
10	Mill Street	TOD Corridor	4,000	
11	Convention Center	Regional Center	4,000	
12	Reno-Tahoe International Airport	Regional Center	4,000	

(a) Available fire flows are approximate and depend on the specific location and piping in the immediate vicinity.

Two areas planned for significant additional development lie within the expanded Truckee Meadows TMSA. These areas include Verdi and the Sunny Hills development. Details of the water facilities for these areas are presented below.

Verdi Facilities

Backbone water facilities have been previously planned by TMWA that will convey 3,560 gpm to the Verdi area. Local groundwater wells are anticipated to produce 800 gpm. These facilities are anticipated to be sufficient to meet the TMWA and Washoe County build out maximum day demand projections of 4,355 gpm. TMWA's proposed facilities include improvements internal to their system west to Mogul, as well as the extension of facilities from Mogul to the Boomtown water system. These improvements are shown in Figure 9-5.

In this Facility Plan, a combination of developer specific estimated demands and demands calculated based on TAZ methodology yields a total estimated demand of 5,270 gpm. Based on this demand estimate, a potential supply deficit of approximately 740 gpm may result. If development in the Verdi area is realized to the extent predicted in this analysis, the following water supply alternatives should be considered. Ultimately, the best alternative will depend on the timing and extent of the actual development in the Verdi area.

- Additional TMWA Supply – The proposed backbone facilities would need to be oversized to the Verdi area. In general, these facilities would need to be increased to the next standard pipe size (i.e. from 18" to 20"). However, most of TMWA's proposed internal system improvements have been constructed or are currently under design; therefore, the practicality of this alternative is limited. The estimated cost to oversize the backbone facilities identified in TMWA's 2006 report, from the intersection of Leroy Street and Mae Anne Avenue, is on the order of 1.5 million dollars.

- Verdi Surface Water Treatment Plant – Verdi has the potential to add supply capacity via a surface water treatment plant to treat Truckee River and/or local spring water resources. This is particularly advantageous from a water supply reliability perspective. The estimated cost for a surface water treatment plant to supply 740 gpm is on the order of 3 million dollars.

- Additional Verdi Groundwater supply – Additional groundwater supply capacity could be investigated, including the potential to increase peak production capacity using aquifer storage and recovery.

The recommended water facility infrastructure for the Verdi area is summarized in Table 9.10 and presented in Figure 9-5. Additional facilities are planned to convey water from the Boomtown area to the Gold Ranch vicinity. Planned service elevation ranges for the Verdi area are 4860 to 5615 feet. Proposed pressure zones are presented in Figure 9-B1 (Appendix B).

Table 9.10 - Verdi Area Water Facility Totals

Facility	**Qty**
Total Length of proposed Transmission Mains	80,300 FT
Total number of Pump Stations	7
Total Storage Volume	6.9 MG
TMWA Facilities (See Appendix B, TMWA 2025 WFP information)	

Sunny Hills Facilities

Backbone distribution system facilities were developed to supply demands for the portion of the proposed Sunny Hills development located in City of Reno. These facilities appear in Figure 9-6. The Sunny Hills area is actually part of the South Truckee Meadows TMSA planning area, and will be included in South Truckee Meadows Section 10 as part of the combined City of Reno and Washoe County report.

The estimated maximum day demand for the Reno portion of the project is 1,460 gpm. Information obtained from the developer indicates proposed water supply connections to the County's system in the Double Diamond area. Planned pressure zones for the Sunny Hills development range from 4550 to 6380 feet, and are presented in Figure 9-B3 (Appendix B). The recommended water facility infrastructure for the Sunny Hills is summarized in Table 9.11.

Table 9.11 - Sunny Hills Water Facility Totals

Sunny Hills Facilities	
Total Length of proposed Transmission Mains	47,200 FT
Total number of Pump Stations	6
Total Storage Volume	1.75 MG

9.5.5 Water Facility Cost Estimates

The estimated costs of the planned water infrastructure for the Truckee Meadows TMSA are summarized in Table 9.12, and are listed in more detail in Appendix B. Costs of the proposed Verdi and Sunny Hills transmission mains, pump stations and storage tanks are summarized in Tables 9.13 and 9.14. 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. Cost analysis project divisions for Verdi and Sunny Hills are shown in Figures 9-B2 and 9-B4 respectively (Appendix B).

TMWA has identified facility "charge areas" for system mains and pumping and distribution improvements in their system (see Appendix B). TMWA has developed a Supply and Treatment Facility Charge and a Storage Facility Charge. These are defined as the unit cost in dollars per gpm of maximum day demand, representing the cost to construct and finance supply/treatment improvements as well as storage improvements as identified in TMWA's Water Facility Plan.

The costs for the 2030 Truckee Meadows TMSA facilities were estimated by multiplying the new development portion of the 2030 maximum day demand (13,500 gpm, not including Verdi), by the Supply and Treatment Facility Charge (currently $3,236 per gpm) and the Storage Facility Charge (currently $1,240 per gpm). These cost values appear in Table 9.12. TMWA's rate schedule showing their current water system facility charges appears in Appendix B.

Table 9.12 - TMWA Truckee Meadows Planning Area Water Infrastructure Costs (a)

Facility Description	Total Cost ($M)	New Development Allocation ($M)	Existing Customer Allocation ($M)
Supply (b)(c)	$43.69	$43.69	$0
Storage (d)	$16.74	$16.74	$0
Mains, Pumping and Distribution improvements	$32.0	$22.7	$9.3
Total	$92.43	$83.13	$9.3

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

(b) Water rights costs are not included.

(c) Supply costs were developed by multiplying the estimated TM TMSA 2030 MDD by TMWA's Rule 5 *Supply and Treatment* Facility charge ($3,236 per maximum day gpm).

(d) Storage costs were developed by multiplying the estimated TM TMSA 2030 MDD by TMWA's Rule 5 Storage Facility Charge (currently $1,240 per maximum day gpm).

Table 9.13 - Verdi Water Infrastructure Costs (a)

Facility Description	Total Cost ($M)	Reno Share of Facility ($M)	County Share of Facility ($M)
Supply (b)(c)	$11.5	$8.6	$2.9
Transmission	$28.4	$22.2	$6.2
Storage	$9.4	$7.4	$2
Total	$49.3	$38.2	$11.1

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

(b) Water rights costs are not included.

(c) Supply costs were developed by multiplying the estimated TM TMSA 2030 MDD by TMWA's Rule 5 *Supply and Treatment* Facility charge ($3,236 per maximum day gpm).

Table 9.14 - Sunny Hills Water Infrastructure Costs (a)

Facility Description	Total Cost ($M)	Reno Share of Facility ($M)	County Share of Facility ($M)
Supply (b)	Insufficient Data		
Transmission	$14.6	0	$14.6
Storage	$2.5	0	$2.5
Total	$17.0	0	$17.0

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

(b) Water rights costs are not included.

9.5.6 Water Planning Limitations

Specific limitations of the water facility plan component for the Truckee Meadows TMSA planning area are listed below.

- Costs of TMWA's overall system improvements appear in their WFP Executive Summary found in Appendix B. Costs of facility improvements specific to the Reno portion of the Truckee Meadows area were not extracted from the TMWA WFP.

- Single backbone mains were used to supply water throughout the new development areas. 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.

- In Verdi, the allocation of cost between Reno and Washoe County is an approximation. Further analysis will be required in the future to determine the appropriate cost allocation for specific facilities.

- The proposed Sunny Hills development is located in both Washoe and Storey Counties. Facilities presented were sized only for the Washoe County portion of the development

and do not accommodate Storey County demands. If development in Storey County is realized, and the water is supplied from Washoe County's system, the facilities will need to be resized to accommodate these demands.

9.6 WASTEWATER

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

9.6.1 Assumptions, Planning Criteria and Methodology

The wastewater flow factor for the Truckee Meadows planning area was assumed from the 2007 Washoe County 208 Water Quality Management Plan. The Truckee Meadows flow factor ranged from a low of 108 gallons per capita per day (gpcd) to 149 gpcd. An average of 128.5 gpcd was used for flow projection. All other wastewater planning assumptions are as stated in Appendix A.

9.6.2 Existing and Future Wastewater Flow

The 2006 annual average wastewater flows for Truckee Meadows Water Reclamation Facility, not including flows from Sparks, Sun Valley or Spanish Springs, is listed in Table 9.15.

Table 9.15 - Existing Wastewater Flows

	2006 Annual Average Flows (MGD) (a)
Truckee Meadows WRF (b)	20.7

(a) Based on 2006 plant flow records.

(b) No flow is included from Sparks, Sun Valley or Spanish Springs. Total 2006 TMWRF flow is 29.3 MGD.

Using the TAZ data, flow was projected for the Reno and County portion of the Truckee Meadows TMSA planning area. The TMWRF capacity projections for Reno and Washoe County are presented in Tables 9.16 and 9.17, respectively.

Table 9.16 - City of Reno Wastewater Projections

Condition	**Flows (MGD)**
2030 Truckee Meadows WRF (a)	39.4
2095 Truckee Meadows WRF (b)	66.6

(a) Based on 125,303 dwelling units and 5,318 acres of commercial and industrial land use.

(b) Based on 221,449 dwelling units and 5,318 acres of commercial and industrial land use

The intensification of wastewater flows in all TODs and Centers was compared to the overall flows. Of the 2030 City water reclamation facility flow, 41 percent is estimated to be produced from areas within a TOD or Center.

Table 9.17 - Washoe County Wastewater Projections

Condition	Flows (MGD)
2030 Truckee Meadows WRF (a)	1.9

(a) Based on 6,835 dwelling units and 45 acres of commercial/industrial zone

The potential flow projection for parcels with existing septic tanks that could be connected to the municipal sewer system is listed in Table 9.18. 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 9.16 and 9.17 includes potential flows from houses with septic tanks.

Table 9.18 - Septic Tank Conversion Flow Projections

	Number of Septic Tanks	Septic Tank Conversion Flows (MGD)
TMWRF		
Reno	1,764	0.353
County	2,571	0.514
Total	4,335	0.867

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

The projected 2030 wastewater flow for TMWRF is 41.3 MGD, not including flow from the City of Sparks, Sun Valley, or Spanish Springs. The 208 Plan has a projected 2030 wastewater flow of 43.6 MGD to 70.1 MGD for the entire TMWRF service area.

9.6.3 Water Reclamation and Disposal

The City of Sparks and the City of Reno each own and operate utilities that distribute reclaimed water from TMWRF. The existing reclaimed water facilities are shown in Figure 9-9. The wastewater treatment and reclamation systems will need to be expanded to dispose of the projected effluent in 2030. Potential reclaimed water expansion areas are identified in the Washoe County Comprehensive Regional Water Management Plan and the 208 Water Quality Management Plan. These plans represent the region's current status of reclaimed water facility planning; therefore, no further detailed planning was conducted for this Facility Plan.

Reuse and discharge of reclaimed water from the various water reclamation facilities in the region may eventually be constrained by a number of factors, including:

- Water quality standards, TMDLs and discharge permit limitations to the Truckee River.
- Possible constraints on use of water originating from outside the Truckee River watershed.
- The need for additional water rights in locations where a return flow to the Truckee River is required.

- Regulatory constraints on discharges to groundwater aquifers.
- The sub-regional imbalance of reclaimed water supply, storage and demand.
- Sites available for use of reclaimed water may not be sufficient to consume all of the available supply of reclaimed water.
- A shift in the application of regulatory policy may increase or restrict the locations where application of reclaimed water is allowed.

A thorough planning and facilities study of regionally integrated reclaimed water systems and management strategies may realize economic and financially prudent alternatives that cannot be realized with separate, independent systems. A detailed evaluation of water reclamation facilities and management strategies was beyond the scope of this Facility Plan.

9.6.4 Planned Wastewater Facilities

Planned wastewater facilities are developed for the Truckee Meadows and Sunny Hills areas. The Sunny Hills area is actually part of the South Truckee Meadows TMSA planning area, and will be included in the South Truckee Meadows Section 10 as part of the combined City of Reno and Washoe County report.

Truckee Meadows

Recommendations for future wastewater collection and treatment facilities were developed for 2030 and are shown on Figure 9-7 for Truckee Meadows. For each sewer collection area, the projected 2030 flows were compared to the capacity of the existing gravity interceptors. Existing lift stations and force mains were not analyzed for remaining available capacity. If the existing City of Reno 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 solution. Facility sizing methods and calculations are included in Appendix A.

A summary of recommended wastewater collection and treatment infrastructure for the Truckee Meadows portion of the TMSA is summarized in Table 9.19.

Table 9.19 - Truckee Meadows Recommended Wastewater Infrastructure (a)

		Units
Interceptors	11,000	Feet
Parallel Interceptors	121,000	Feet
2030 Treatment Capacity for TMWRF (not including City of Sparks flow)	41.3	MGD

(a) Only City collection system analyzed.

Sunny Hills

Wastewater facilities to serve the Sunny Hills area are shown on Figure 9-8. The collection system will connect to the existing Washoe County collection system and South Truckee

Meadows Water Reclamation Facility (STMWRF). The analysis of the Washoe County system will be presented in the South Truckee Meadows Section, to be completed by September 2007.

A summary of the recommended wastewater collection facilities for Sunny Hills is summarized in Table 9.20.

Table 9.20 - Sunny Hills Recommended Wastewater Infrastructure (a)

		Units
Interceptors	13,100	Feet
Force Mains	4,200	Feet
Lift Station	1	Station

9.6.5 Wastewater Facility Cost Estimates

Wastewater infrastructure costs are summarized for the Truckee Meadows portion of the TMSA in Table 9.21, 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 9.21 - Truckee Meadows Wastewater Infrastructure Costs (a)

Facility Description	Total Cost ($M)	Reno Share of Facility ($M)	County Share of Facility ($M)
Collection System (b)	$44.1	$42.8	$1.3
City of Reno Planned Capacity Improvements (c)	$93.0	Not Available	Not Available
Truckee Meadows WRF Treatment (d)	$81.9	$76.7	$5.2
Total	$219.0		

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

(b) Only City collection system analyzed.

(c) 5 year projected CIP improvements to increase capacity and not fix existing problems.

(d) Cost based on expansion of plant from 46 MGD (current capacity) to 49.9 MGD (existing flow of 29.3 MGD and projected flow of 20.6 MGD).

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.

Wastewater infrastructure costs are summarized for Sunny Hills in Table 9.22, and are listed in more detail in Appendix C.

Table 9.22 - Sunny Hills Wastewater Infrastructure Costs (a)

Facility Description	Total Cost ($M)	Reno Share of Facility ($M)	County Share of Facility ($M)
Collection System	$2.5	$2.5	$0
Total	$2.5	$2.5	$0

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

9.6.6 Wastewater Planning Limitations

Specific limitations of the wastewater planning in the Truckee Meadows 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 flow projection methodology for 2095 further exacerbates this discrepancy.

- The interceptors analyzed in this Facility Plan represent approximately ten percent of Reno's collection system pipelines. Substantial improvements to smaller existing trunk sewers and collection pipelines are also required. The projected need for overall sewer collection system improvement and rehabilitation is more on the order of $20 million per year. Evaluation of these potential improvements is beyond the scope of this Facility Plan.

- The existing interceptor capacity was analyzed using an average capacity for a pipe segment. There will be sections of pipe reach with less capacity that may require upsizing even if the pipe reach as a whole has enough capacity. More detailed analysis of the sewer collection system is required to determine specific improvements by pipe section.

- Effluent disposal planning for the Truckee Meadows TMSA planning area is conceptual. The existing information for regional reclaimed water facilities has been provided; however, a thorough planning and facilities study of regionally integrated reclaimed water systems and management strategies is required to develop a plan to meet the disposal capacity requirements for the projected 2030 wastewater flows.

- The allocation of cost between Reno and Washoe County is an approximation. Further analysis will be required in the future to determine the appropriate cost allocation for specific facilities.

- The proposed Sunny Hills development is located in both Washoe and Storey Counties. Facilities presented were sized only for the Washoe County portion of the development

and do not accommodate Storey County flows. If development in Storey County is realized, facilities will need to be resized to accommodate these flows.

9.7 POLICY RECOMMENDATIONS (INCLUSIVE OF WATER, WASTEWATER)

Reuse and discharge of reclaimed water from the various water reclamation facilities in the region is constrained by a number of factors. Regionally integrated reclaimed water systems and management strategies may realize economic and financially prudent alternatives that cannot be realized with separate, independent systems.