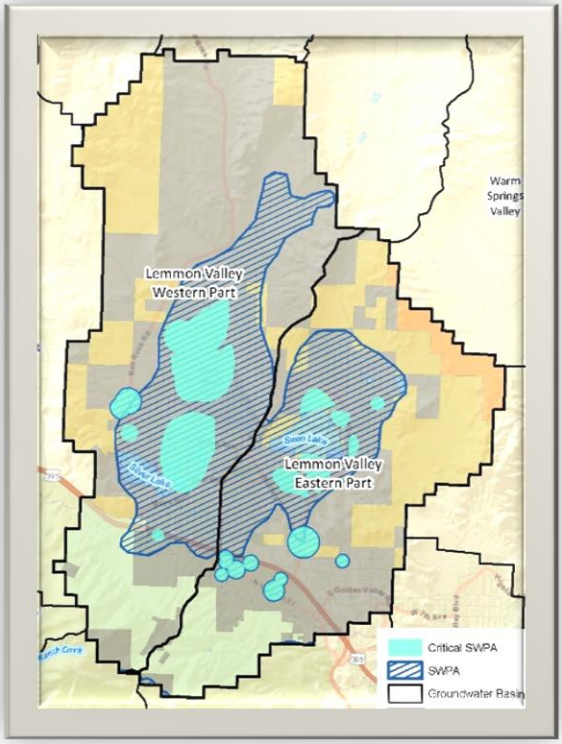
Lemmon Valley

Groundwater Basin #092A and #092B, Source Water Profile

Click here for the SWPA Map



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Introduction

The Lemmon Valley source water profile is a component of the 2020 Integrated Source Water and 319(h) Watershed Protection Plan for Public Water Systems and the Truckee River in the Truckee Meadows (Plan). This document is a part of the on-line source water mapping tool.

This Source Water Protection Area (SWPA) description is intended to be a guide and resource for organizations working within the basin, and an educational tool for those interested in learning more about the drinking water source in the area where they live. This Plan can be used to support funding for a multitude of water quality projects in the basin.

Summary

This profile focuses on protecting water quality for the groundwater sources in this basin that are used by water systems to supply drinking water to the general public also known as source water. There are no surface waters used directly by water systems in this basin. Potential and existing water quality concerns, types of land uses, management strategies and projects, and the involved stakeholders and their corresponding plans with water quality components are described.

Lemmon Valley Hydrographic Basins #092A and #092B are topographically closed, and encompass about 97 square miles. The basin is subdivided into the east and west subbasins by the Airport Fault that runs down the middle of the basin. The Lemmon Valley HUC-12 Watershed (#180800030901) encompasses both of these groundwater basins. A groundwater basin is a structural depression filled with unconsolidated basin-fill. The surrounding mountains and the underlying bedrock are complexly faulted. Features other than mountain ridges and basin-fill deposits include Silver Lake and Swan Lake. Groundwater levels fluctuate annually with rises during the winter months and declines during the summer months.

SWPAs for this area were developed by stakeholders to help protect drinking water sources. There are 25 public water systems wells in this basin; eleven of them are operated by the Truckee Meadows Water Authority (TMWA) and the others are operated by thirteen other small public water systems (mobile home parks, restaurants, etc.).

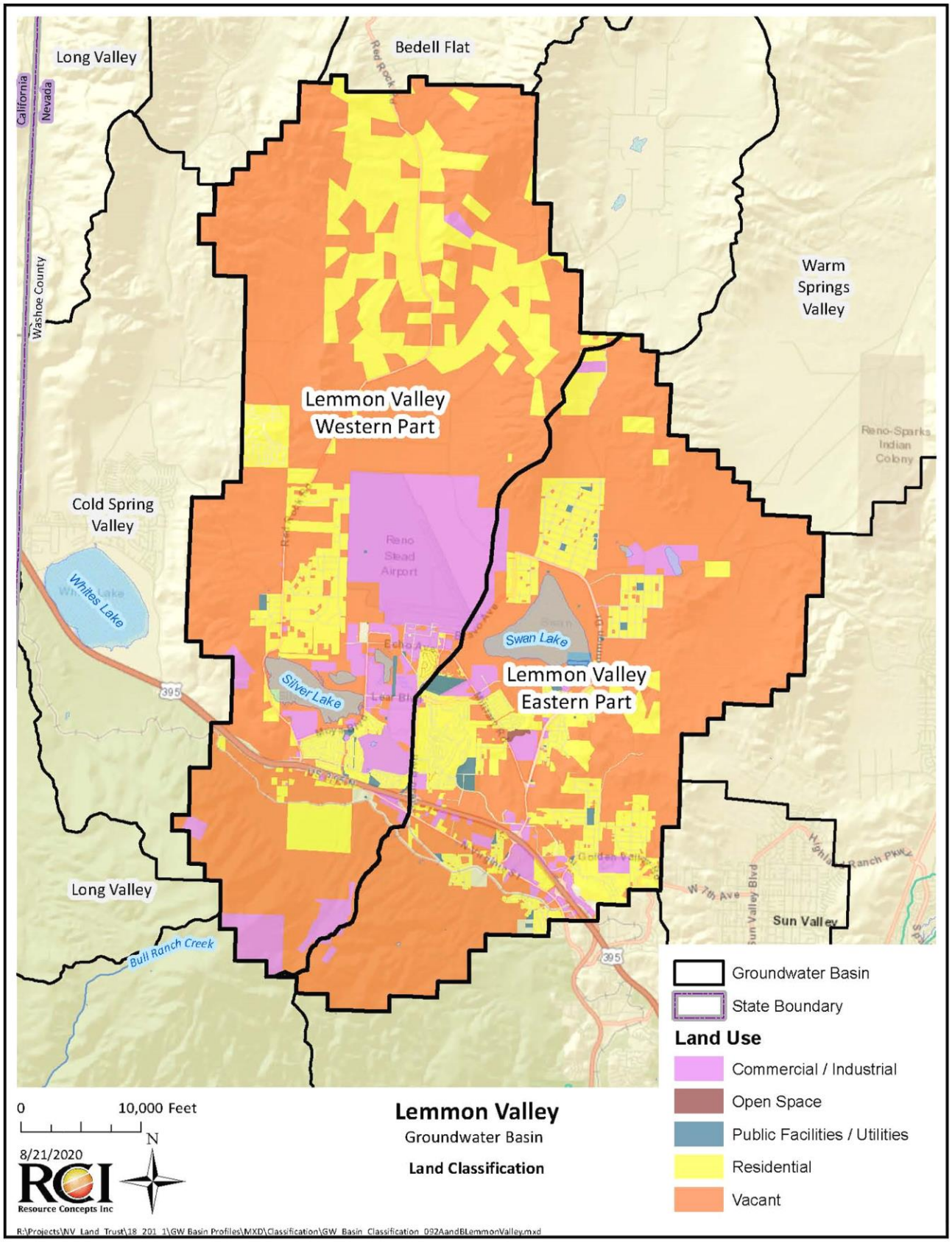
The following table summarizes key water quality aspects of this basin.

Basin Summary	
Basins	• Groundwater Basins: Lemmon Valley # 092A and #092B. • HUC-12 Watershed: Lemmon Valley #180800030901.
Source Water Protection Areas	• A SWPA provides a buffer around public water system wells, and it represents a precautionary indicator to safeguard the drinking water sources. • Critical SWPAs represent areas closer to public water system wells. • 25 public water system wells are managed by 14 different public water systems. • 19,700 acres, or roughly 27% of the basin is within the Source Water Protection Area. • 4,800 total acres, or approximately 7% of the basin is within a Critical SWPA.
Special Considerations & Issues	• Groundwater quality and quantity varies. The shallow groundwater near the playa areas is highly mineralized and poor water quality. • Locally, higher nitrate levels are associated with a higher density of septic tanks. • The nitrate concentration found in wells are well-specific and depends on depth to groundwater, flow direction, well screen depth, and the soil types between the septic tanks and well screen. • There are no surface waters used for public water supply and there are no surface waters with "designated" Beneficial Uses or water quality standards in Lemmon Valley.

SWPA Acreage	Type	Acres	%
Land Jurisdiction	City of Reno:	10,300	14%
	Washoe County Non- Federal:	7,900	11%
	BLM:	1,410	2%
Land Use	Agriculture:	0	0%
	Commercial/Industrial:	4,900	25%
	Residential:	4900	25%
	Public Facility/Utility:	360	2%
	Vacant:	8,400	43%

Land uses and jurisdictions in the SWPAs are summarized in the adjacent table and illustrated by the Land Classification Figure.

Residential and commercial/industrial land uses are the dominant acitivities in this basin. The potential and existing groundwater quality concerns generated are primarily due to risk of hazardous material spills or leaks from commercial/industrial activities and nitrate from septic systems.


Long Valley
Bedell Flat
California
Nevada
Washoe County
Warm Springs Valley
Lemmon Valley Western Part
Reno-Sparks Indian Colony
Cold Spring Valley
Reno Stead Airport
Whites Lake
Swan Lake
Silver Lake
Lemmon Valley Eastern Part
395
Long Valley
Bull Ranch Creek
Sun Valley
Groundwater Basin
State Boundary
Land Use
Commercial / Industrial
Open Space
Public Facilities / Utilities
Residential
Vacant
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RCI
Resource Concepts Inc
Lemmon Valley
Groundwater Basin
Land Classification
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Water Quality Standards and Beneficial Uses

Water quality standards for surface water in the state of Nevada are established by Nevada Administrative Code (NAC) NAC 445A.11704 through NAC 445A.2234. Lemmon Valley is located within the "Western Region". There are no designated beneficial uses (NAC 445A.1782) or water quality standards (NAC 445A.1784) for water bodies in the Western Region, which includes Lemmon Valley. However, Nevada's policy is to protect all groundwater against deterioration in quality in order to maintain supplies that are suitable for beneficial uses.

Groundwater is an important source of drinking water for public water systems in this watershed. Groundwater quality and quantity varies naturally, with highly mineralized, poor groundwater quality in shallow groundwater near the playa areas. Groundwater water quality has been affected by nitrate and solvents through human activities.

Potential and Existing Water Quality Concerns

The primary potential and existing water quality concerns in this basin are listed below and described in the following paragraphs:

- Hazardous Materials from Spills or Leaks
- Pollution from Urban Areas
- Nitrate from Individual Sewage Disposal System

Hazardous Materials from Spills or Leaks

The Reno Stead Airport, US Hwy 395 and other commercial and industrial businesses are in this basin. The U.S. Department of Transportation accumulated a list of commonly transported hazardous materials in the area (WRWC, 2017). These include:

- Ammonia perchlorate
- Anhydrous ammonia
- Chlorine
- Cyanide
- Hydrochloric acid
- Hydrogen sulfide
- Nitro cellulose (wet)
- Propane
- Petroleum naphtha
- Phosphoric acid
- White phosphorous
- Propargyl alcohol
- Sulfuric acid
- Sodium hydroxide

Remediation of solvent-related contamination at the Stead Solvent Site near the southern boundary of the Stead Airport in Basin #092A began in the late 1990s and is listed as completed by the Nevada Division of Environmental Protection (NDEP). The clean-up activities successfully reduced the migration of the contaminant plume.

Pollution from Urban Area Runoff

Groundwater may be vulnerable to polluted runoff in urban areas, particularly where there are expanding residential developments. Potential contaminants include:

- nutrients from fertilizers
- dissolved salts from excess irrigation
- trash
- bacteria from animal waste
- pollution from household waste
- runoff from roads and parking lots

Excessive fertilization in green areas such as yards, fields, golf courses or parks are potential sources of nutrients from runoff. These areas may also contribute E. coli from animal waste such as from horses, dogs and geese. Agricultural properties in the area also have livestock and farming practices, which may contribute to water quality issues from fertilizers, herbicides and livestock waste.

Excess irrigation of green areas can also create persistent "dry weather" flows due to direct discharge to storm drains and/or seepage through shallow soil layers to existing natural drainages. Irrigation seepage through desert soils, that were not previously irrigated, can mobilize salts (TDS), which in turn can lead to perennial flows with poor water quality in drainages that were originally ephemeral.

Water levels in the Swan Lake playa, a "closed" basin, rise and fall with seasonal runoff. Certain TMWA wells were surrounded by floodwaters in 2017, resulting in these wells being temporarily inactive due to potential for contamination.

Nitrate from Individual Sewage Disposal Systems

Individual Sewage Disposal Systems, or septic systems, are associated with nitrate contamination of groundwater if there are large numbers concentrated in a small area; for example, neighborhoods with lot sizes less than one acre, or if they are not maintained properly (WRWC, 2017). There are about 1,800 parcels with septic systems in the SWPAs, some with lot sizes between 0.3 and 0.6 acres. In Lemmon Valley, the nitrate concentrations found in wells are well-specific and depend on depth to groundwater, flow direction, well screen depth, and the soil types between the septic tanks and the well screen.

Strategies to Protect and Improve Water Quality

The water quality concerns identified in this basin can be addressed through management strategies described in this section, the proposed projects detailed in the Project Profiles, as well as applicable on-going water quality projects and programs described under Stakeholders and Plans. These strategies pertain to the entire basin but may be prioritized in SWPAs.

Source Water Protection Area Identification and Management

A SWPA is a management area surrounding a surface water or groundwater resource that supplies water for public consumption. Activities in these buffer areas can affect the quality of water downstream or underground. These management strategies acknowledge the value of these SWPAs to prevent future contamination of drinking water sources.

There are two types of SWPA buffers in this basin. The first is a buffer surrounding the lower elevations of the valley and represents a precautionary indicator to safeguard these drinking water sources. The second type of buffer covers more critical areas close to the water system wells based on a 20-year time of travel for groundwater. These areas are illustrated on the Jurisdiction and Source Water Protection Areas Figure. The following objectives are significant in both future and on-going SWPA management:

- Inform landowners in SWPAs about their proximity to a valuable drinking water source and how they can help protect their water quality.
- Encourage coordination between Public Water Systems, landowners, and City or County planners to consider the importance of SWPAs in project reviews.
- Explore collaborative funding for water quality improvements and support the resource investigations needed to develop viable projects.
- Prioritize physical improvements in SWPAs to protect and improve source water quality.

Education and Outreach

The following education and outreach objectives are intended to help effectuate positive actions to protect water quality:

- Work with Homeowner Associations regarding source water pollution prevention measures.
- Increase knowledge about household and commercial chemical use, storage, and disposal through local outreach efforts.
- Inform landowners and developers residing in critical SWPAs about the importance of avoiding contamination and their proximity to a valuable drinking water source.

Interagency Communication

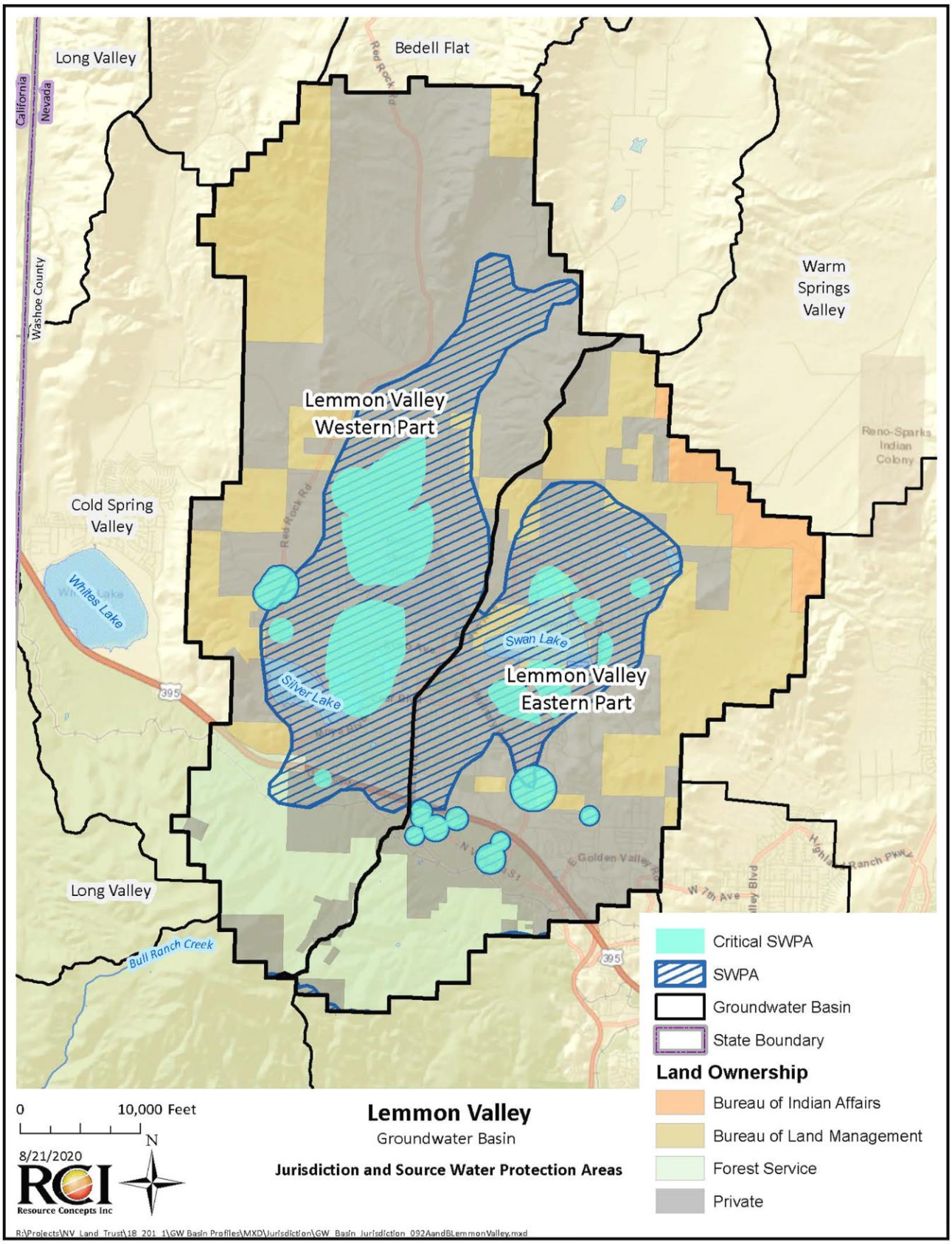
The following interagency communication objectives are important tools to both reinvigorate and invest additional resources in water quality, as well as utilize existing resources and programs:

- Each agency may evaluate how to improve lines of communication within and between jurisdictions regarding water quality issues; i.e. City of Reno, Washoe County, TMWA, NDEP, District Health, and BLM.
- Continue to increase coordination and communication between the appropriate agencies regarding spills and corrective actions along Hwy 395 and the airport.
- Collaborate with the Washoe/Storey Cooperative Weed Management Area to support their efforts in noxious weed management (WSCWMA Website).

Resource Investigation and Planning

Stakeholders may consider supporting the following resource investigations and planning, which can help fill data gaps, inform implementation designs and prioritize projects:

- Consider expanding groundwater quality monitoring.
- Research how to identify private wells that present a groundwater contamination risk and that might need to be repaired or abandoned.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Long Valley
Bull Ranch Creek
Critical SWPA
SWPA
Groundwater Basin
State Boundary
Land Ownership
Bureau of Indian Affairs
Bureau of Land Management
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Water Quality Best Management Practices

Stakeholders may consider supporting the following Water Quality Best Management Practices, or BMPs, that may improve and prevent degradation to water quality resources:

- Water quality improvement projects.
- Proper abandonment of wells.
- Physical improvements prioritized in SWPAs for water quality improvement and protection.
- Fertilizer and pesticide management measures for irrigated green spaces.

Proposed Implementation Projects

Proposed implementation actions are generally described under the Strategies to Protect and Improve Water Quality. Specific implementation actions have been developed into proposed projects by local stakeholders and are described in Project Profiles. These Project Profiles include the information needed, as identified in the Environmental Protection Agency (EPA) guidance for nine critical elements for an endorsable watershed management plan. Future projects could also be brought forward to funding agencies through:

- Demonstrating advancement of the strategies identified for this watershed in the Source Water and Watershed Protection Plan.
- Using the Project Profile format to establish consistency with the nine critical elements of an EPA endorsed plan.

As discussed in the following Stakeholders and Plans section, municipality and agency projects are also incorporated by reference.

Stakeholders and Plans

Stakeholder information and existing plans were used extensively in development of this Plan for Washoe County. These municipalities and agencies each have unique strategies and capital improvement plans that include water quality protection or improvement projects. These are updated regularly at differing timeframes (i.e. annually, every five years, etc.) according to their specific budgeting and planning processes. The applicable planning documents are briefly described and referenced in this section. Those projects pertaining to water quality protection and improvement are incorporated by reference.

Project Stakeholders	
• City of Reno • Bureau of Land Management • Nevada Department of Transportation • Nevada Division of Environmental Protection • Nevada Division of Forestry	• Truckee Meadows Regional Planning Agency • Truckee Meadows Water Authority • Washoe County • Washoe County Health District • Western Regional Water Commission

City of Reno

The City of Reno Master Plan goals and policies provide the framework for decision-making in the community.

Drinking water protection is addressed in the Master Plan's guiding principle to promote a safe and more resilient community. The City works with TMWA and other partners to ensure clean drinking water.

Water quality is also addressed in the guiding principle for quality places and outdoor recreation opportunities in the sections on hydrologic resources, major drainageways and no net loss of wetlands, stream environments, playas, spring fed stands of riparian vegetation, and non-404 wetlands in the City, in terms of both acreage and value. The Design Principles for Sustainable Development also contain sections related to water quality.

The following articles from the Master Plan discuss several water-related items that are applicable to this Plan:

- Article XVIII: Section 18.12.1801 to 1808 describes wetlands and stream environment protection standards established for the review of development proposals within wetlands, stream environments, and areas of significant hydrologic resources.
- Article XIX: Section 18.12.1902 to 1907 Drainage Way Protection Standards carries out the provisions of the City of Reno Major Drainageways Plan, an element of the City of Reno Master Plan, and establishes standards for the review of development proposals within major drainage ways to, among other actions, maintain, preserve, or enhance the quality of the water in both the Truckee River and Stead basins.

The City of Reno also provides comprehensive services for construction and maintenance roads, landscaping and drainage facilities, citywide planning and code compliance, and emergency response services for fire and hazardous materials. All these roles contribute to preserving and improving water quality in the basin.

Additionally, the City of Reno is divided into five Neighborhood Advisory Board Wards. Each Ward has one representative on the Reno City Council that is specifically focused on the needs of their part of the City. These Wards provide opportunities for citizens to engage in important community issues and is the most efficient way for citizens to communicate their concerns and ask questions prior to any large decisions or projects. As such, these Wards and their input are essential in the implementation and success of any projects and plans within the community. Source water protection for this area falls within Ward 4.

Bureau of Land Management

The Nevada BLM has Resource Advisory Councils (RACs) which allow community members to be involved in natural resource planning and management issues on BLM managed public land. Washoe County is a part of the Sierra Front-Northwestern Great Basin RAC which is administered through the BLM-Carson City and Winnemucca District offices. BLM Resource Advisory Councils-Nevada

The BLM also has specific Resource Management Plans, or RMPs, that apply to this basin. These plans generally outline the way that the BLM currently manages and intends to manage the multiple resources on public land. Within this basin, the following plans and sections are applicable:

- Carson City Consolidated Resource Management Plan (2001):

  RIP-1: Riparian Management discusses how riparian areas on BLM land should be managed, monitored, and maintained. The desired outcome in this section is to protect and maintain existing and potential fisheries and riparian areas in good or better condition.

  SWA-1: Soils, Watershed and Air Quality describes specific techniques and goals for all watersheds within the planning area such as reducing soil loss, flood damage, and sediment damage from human activities.

  WAT-1: Water Resources discusses management for good water quality on public lands such as watershed management plans as an important administrative action.

- Carson City Fire Management Plan (2016):
  The Fire Management Plan (FMP) goal is to restore sagebrush ecosystems throughout the planning area. In doing so, the risk of wildfire and its negative effects should eventually decrease. Since wildfire is an issue in this basin, management to reduce its risk is a key planning component.

Nevada Department of Transportation

The Nevada Department of Transportation (NDOT) has developed their Stormwater Management Program to reduce stormwater pollution from NDOT managed facilities and roads. The program BMPs and annual report outline the specific measures that NDOT will take to reduce stormwater pollutant discharges from its owned and operated storm drain system:

- Stormwater Management Program (2013):

  The overall goal of the NDOT Stormwater Management Program is to reduce pollution associated with stormwater from NDOT's MS4 to the maximum extent practicable, as well as to protect surface and groundwater resources within the MS4 permit area. The Stormwater Management Program addresses stormwater pollution control as it relates to the planning, design, construction, and maintenance of NDOT's highway infrastructure statewide.

- Stormwater Management Program: Annual Report (2017):

  This basin is impacted or has the potential to be impacted by I-80, I-580, Hwy 395, and Hwy 431. The Stormwater Management Program provides a helpful planning outline on handling and mitigating pollution from the roads.

Nevada Division of Environmental Protection

The NDEP has a goal to preserve and enhance the environment of the State to protect public health, sustain healthy ecosystems, and contribute to a vibrant economy. Specifically, the Integrated Source Water Protection Program under the Safe Drinking Water Bureau works to help protect source water quality. This program offers technical assistance for source water protection projects. The program coordinates source water protection activities at the local, state, and federal levels, and encourages community-based protection and preventive management strategies to ensure all public drinking water resources are kept safe from future contamination. The 2010 Nevada Integrated Source Water Protection Program guidance document details the program components as well as the requirements for a State-endorsed Community Source Water Protection Plan.

Nevada Division of Forestry

The Nevada Division of Forestry (NDF) is a state agency that uses a collaborative process to deliver science based natural resource management and protection to promote resilient landscapes, fire adapted communities, and safe, effective wildfire response provided by employees that embrace the core values of duty, respect, and integrity.

NDF provides professional natural resource and wildland fire management services to Nevada citizens and visitors to enhance, conserve and protect forest, rangeland and watershed values, endangered plants, and other native flora. Protection of these resources helps to improve water quality:

- Community Wildfire Protection Plans:

  Community Wildfire Protection Plans (CWPPs) are authorized and defined in Title I of the Healthy Forests Restoration Act of 2003 (HFRA). CWPP's represent the best opportunity for communities to address the challenges of the Wildland-Urban Interface. A CWPP helps communities define their priorities for the protection of life, property, and shared assets-at-risk from wildfires. Developing a CWPP encourages community members and leaders to have valuable discussions about wildfire preparedness, evacuation planning, and local fire district capabilities. The CWPP increases grant funding opportunities by prioritizing fuel reduction projects around and within the community.

- Nevada Wildland Fire Cohesive Strategy:

  The Nevada Fire Board Oversight Body is the custodian of the 2015 Nevada Wildland Fire Cohesive Strategy Summit's Action Plan to ensure goal achievement and identify emerging topics. This oversight body acts as an "advisory" body and is charged with the Nevada Cohesive Strategy Summit report and its Action Steps, ensuring that goal achievement is accomplished and monitoring emerging topics through the Nevada Fire Board. This body monitors progress, develops issue resolution, and addresses emerging issues such as protecting water quality.

Truckee Meadows Regional Planning Agency

The Truckee Meadows Regional Planning Agency (TMRPA) fosters coordination among Reno, Sparks and Washoe County. TMRPA facilitates land use, infrastructure provision and resource management conversations among public and private decision makers. The agency also serves as a collaborative information and data warehouse, coordinating regional data collection and delivering advanced geospatial analytics for regional solutions. TMRPA includes a Regional Planning Governing Board and a Regional Planning Commission.

The TMRPA Regional Plan (2012 as amended) provides goals and policies for multiple plans and programs, including those with watershed and wellhead protection components. The plan was revised in 2019-2020 and is considered a living document that will evolve over time.

Truckee Meadows Water Authority

TMWA is responsible for almost all municipal water delivery in the greater Reno-Sparks area. TMWA also owns and operates the municipal wells in this basin. The following program and plans guide the management of these water resources:

- TMWA Water Resources Plan (2016-2035):

  This plan describes water quality issues and goals for the water resources managed by TMWA. Special focus is placed on changes in future water supply and demand, and how those changes will impact the region's water resources.

- Source Water Quality Assurance Program (2016-2035):

  TMWA's objective is to deliver high-quality potable water to its customers in a cost-effective manner. To achieve this objective, TMWA has established a water quality assurance program. The components that make up the program are source water quality protection, potable water treatment, maintenance of distribution system water quality, and cross connection control.

- Wellhead Protection Plan (2016):

  The purpose of the Wellhead Protection Plan is to protect groundwater that serves as a source for public drinking water supplies. This plan is intended to be a tool used by TMWA to assist in protecting drinking water sources.

Washoe County Health District

The Washoe County Health District has regulatory authority over a wide variety of programs and services in the Truckee Meadows, including underground storage tanks, septic systems, all public water systems, domestic wells, water projects and community development, grading permits, solid waste management, and emergency preparedness. The Health District regulations are provided in several documents as listed below:

- Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater and Sanitation. These regulations provide the minimum requirements to be followed by any person developing property served by an on-site

sewage disposal system. These requirements are promulgated to prevent the spread of disease, protect the water quality of this County, and ensure the on-site sewage disposal systems function properly.

- Regulations of the Washoe County District Board of Health Governing Well Construction. These regulations provide minimum requirements to be followed by any person when drilling and plugging specific kinds of wells. A well construction permit is required to drill a well for consumptive use or monitoring wells. These requirements are primarily promulgated to protect the quantity and quality of the waters of this County from waste and contamination, and to provide public protection by enforcing proper construction and plugging of wells.
- Regulations of the Washoe County District Board of Health Governing Solid Waste Management. These regulations protect water quality through the regulation of municipal solid waste landfills.

Washoe County

Activities in Washoe County are reviewed according to the Master Plan Planning Areas. The Lemmon Valley area is included in the North Valleys planning area. The county has Citizen Advisory Boards (CABs) which provide important community perspective on local issues to the Washoe County Board of Commissioners. The Lemmon Valley area is wholly within the North Valleys CAB (CAB Boundaries).

The Washoe County Master Plan (2008) has Goals and Policies for Public Services and Facilities, and Open Space and Natural Resource Management. Applicable sections include:

- Article 418, Significant Hydrologic Resources, which regulates development activity within and adjacent to perennial streams to ensure that these resources are protected and enhanced. (Note: this does not apply to the Truckee River).
- Article 420, Storm Drainage Standards, sets forth standards for ensuring that both private and public development provides adequate protection for citizens and property. Therefore, it minimizes and controls erosion and pollution impacts on the natural environment, and additionally minimizes maintenance costs for drainage and flood control systems.
- Article 421, the Storm Water Discharge Program, which protects and enhances the water quality of watercourses, water bodies, groundwater and wetlands in a manner pursuant to and consistent with the Clean Water Act.
- Article 810, Special Use Permits, which provides a method of reviewing certain uses to determine if they have the potential to adversely affect public facilities in the vicinity.

Washoe County also provides comprehensive services for construction and maintenance roads, landscaping and drainage facilities; county-wide planning and code compliance; and emergency response services for fire and hazardous materials. All of these roles contribute to preserving and improving water quality.

Western Regional Water Commission and the Northern Nevada Water Planning Commission

The Western Regional Water Commission (WRWC) focuses on improving water resource planning at the regional level and facilitating coordinated resource management among City of Reno, City of Sparks, Washoe County, TMWA, Truckee Meadows Water Reclamation Facility, South Truckee Meadows GID and Sun Valley GID.

The Northern Nevada Water Planning Commission (NNWPC) is a technical advisory panel that reports to the WRWC. The NNWPC develops and updates a Comprehensive Regional Water Management Plan (RWMP) and makes recommendations to the WRWC for adoption. In addition, the NNWPC develops priorities and an annual budget for the Regional Water Management Fund, also for recommendations to the WRWC.

The Comprehensive Regional Water Management Plan includes several applicable objectives:

- Objective 1.2 Provide for a Sustainable Water Supply and an Acceptable Level of Service to the Community (including protecting groundwater recharge areas).
- Objective 1.3 Implement measures to protect and enhance water quality for a sustainable water supply (including source water protection).
- Objective 2.1 Promote Efficient Use of Resources (Reduction of Non-Point Source Pollution for TMWRF Pollutant Credit).
- Objective 2.2 Manage wastewater for protection and enhancement of water quality.
- Objective 3.1 Effective and integrated watershed management (protection of human health, property, water quality including storm water).

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