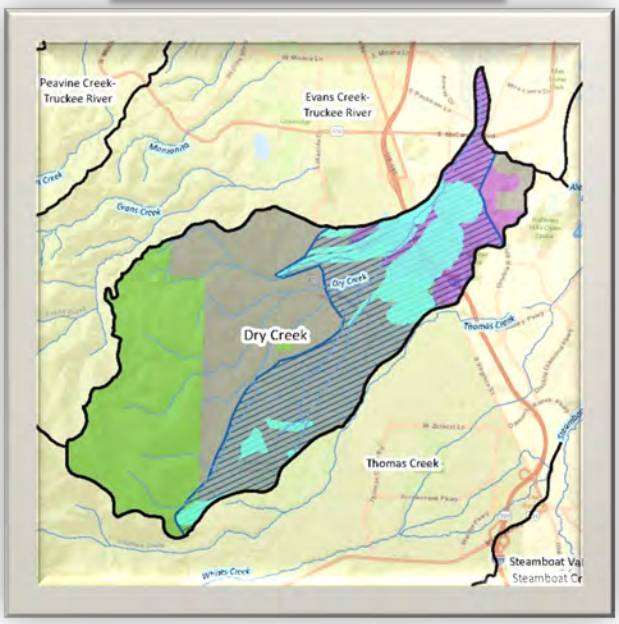
Dry Creek

HUC-12 Watershed #160501020507 Profile

Click here for complete HUC-12 Watersheds Map



Contents

Introduction

The Dry Creek-Truckee River HUC-12 Watershed 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), as well as the Watershed Management and Protection Plan for Tributaries to the Truckee River. This document is a part of the on-line watershed mapping tool.

This watershed description is intended to be a guide and resource for organizations working within the watershed and an educational tool for those interested in learning more about the watershed in which they live. This Plan can be used to support funding for a multitude of water quality projects in the watershed. Note that only non-regulated activities are eligible for the Nevada Division of Environmental Protection Source Water Protection Program or the 319 Non-Point Source Program funding.

Summary

This profile focuses on the watershed's water quality. It includes potential and existing concerns, types of land uses, watershed management strategies and projects, and the involved stakeholders and their corresponding plans with water quality components.

The Dry Creek-Truckee River HUC-12 Watershed is the smallest watershed out of all the Truckee River watersheds in the Truckee Meadows consisting of 10,621 acres. This watershed is a part of the Truckee Meadows Groundwater Basin and hosts seven public water wells. The upper portion of this watershed is forested and relatively undeveloped but was disturbed by the 2000 Arrowcreek Fire. Ranches and residential communities make up the central watershed area, while commercial development is dominant closer to I-580. Dry Creek, the primary drainage in this watershed, is fed from springs and collects irrigation runoff before it flows into culverts. These culverts pass under the Reno-Tahoe International Airport, and outlet into Boynton Slough in the adjacent watershed.

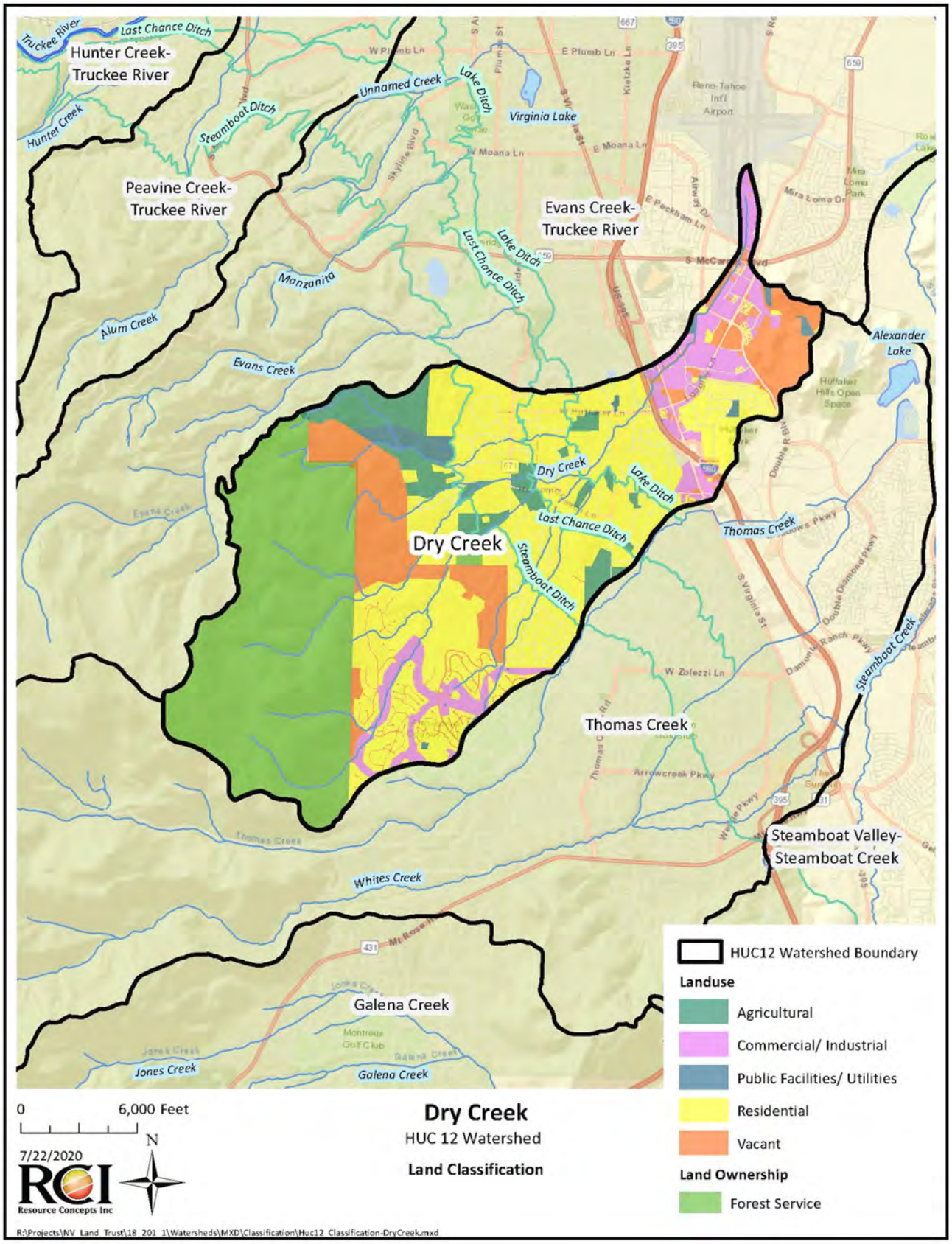
Source Water Protection Areas (SWPAs) for this watershed were developed by stakeholders to help protect drinking water sources. This watershed is an important area for groundwater recharge and hosts seven public water system wells and, as a result, a little less than half of this watershed is in a SWPA. Surface water bodies include Dry Creek and three irrigation ditches. The following table summarizes key water quality aspects in this watershed.

Watershed Summary	
Basins	• Dry Creek-Truckee River HUC-12 Watershed #160501020507. • Groundwater Basin: 087 (Truckee Meadows) underlies this watershed.
Water Bodies & Water Quality	• Dry Creek, impaired for *E. coli*, see NAC 445A.1726. • Steamboat, Last Chance, Lake and Cochran ditches.
Source Water Protection Areas	• A SWPA encompasses approximately half of the watershed with buffers along the Sierra Front, an important groundwater recharge area. It represents a precautionary indicator to safeguard the drinking water sources. • Critical SWPAs represent areas closer to water system wells. • 4,340 total acres, or roughly 40% of the watershed is within a Source Water Protection Area. • 1,460 total acres, or approximately 10% of the watershed is in a Critical Source Water Protection Area.
Special Considerations & Issues	• 2000 Arrowcreek Fire: fire susceptibility, erosion and invasive weed concerns. • Channel encroachment and vegetation removal threatens Dry Creek channel stability. • The upper half of the watershed is undeveloped and forested, while the lower is urbanized with commercial/industrial development near the airport. • Irrigated pastureland alongside Dry Creek. • 7 public wells that are important drinking water sources. • Many residential communities on septic systems. • I-580 is a major transportation corridor.

	Type	Acres	%
Land Jurisdiction	City of Reno:	1,686	16%
	Washoe County Non-Federal:	5,755	54%
	USFS:	3,175	30%
Land Use	Agriculture:	660	6%
	Commercial/Industrial:	820	8%
	Residential:	4,060	38%
	Public Facilities/Utilities:	165	2%
	Vacant:	1,350	13%
	Roads and Easements:	385	4%
	State of Nevada:	10	<1%
	Federally Managed:	3,175	30%

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

The upper 30% of the watershed is federally managed National Forest. The mid portion, outside the city of Reno boundary, has residential and vacant (Ballardini and Arrow Creek Open Space) land uses that characterize the private land in Washoe County. Commerical / industrial uses occur along the transportation corridors within the city of Reno boundary. The potential and existing water quality concerns associated with these types of land uses are primarily hazardous materials from accidental spills or leaks, pollution from urban area runoff, and sediment from watershed disturbance (wildland fire, noxious weeds, etc.).


Truckee River
Last Chance Ditch
Hunter Creek-
Truckee River
Hunter Creek
Unnamed Creek
Lake Ditch
Steamboat Ditch
Virginia Lake
Peavine Creek-
Truckee River
Evans Creek-
Truckee River
Manzanita
Alum Creek
Evans Creek
Alexander
Lake
Dry Creek
Thomas Creek
Steamboat Creek
Steamboat Valley-
Steamboat Creek
Whites Creek
Galena Creek
Jones Creek
HUC12 Watershed Boundary
Landuse
Agricultural
Commercial/ Industrial
Public Facilities/ Utilities
Residential
Vacant
Land Ownership
Forest Service
0
6,000 Feet
N
7/22/2020
RCI
Resource Concepts Inc
Dry Creek
HUC 12 Watershed
Land Classification
R:\Projects\NV Land Trust\18 201 1\Watersheds\MXD\Classification\Huc12 Classification-DryCreek.mxd

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. Standards applicable to beneficial uses are generally described under NAC 445A.122. The Nevada Division of Environmental Protection (NDEP) Bureau of Water Quality Planning Nevada 2016-2018 Water Quality Integrated Report identifies the beneficial uses and the surface water quality conditions in this watershed, as summarized below:

- Dry Creek is a tributary to Steamboat Creek (water quality standards NAC 445A.1726) and is impaired for "recreation involving contact with water" due to concentrations of the *Escherichia coli (E. coli)* bacteria.

Groundwater is an important source of drinking water for public water systems in this watershed. There are no known contaminants within this watershed caused by human activities to groundwater. Arsenic and tetrachloroethylene (PCE) occur in the groundwater basin to the north in the Evans Creek-Truckee River HUC-12 watershed.

Potential and Existing Water Quality Concerns

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

- Hazardous Materials from Spills or Leaks
- Pollution from Urban Areas
- Sediment from Erosion
- Nitrate from Individual Sewage Disposal Systems

Hazardous Materials from Spills or Leaks

Transportation corridors within the lower part of the Dry Creek watershed have typical commercial and industrial development (Land Classification Figure) along routes I-580, US Hwy 395, and Longley Lane. The use and storage of chemicals, fuels, and other materials in commercial/industrial areas, as well as transportation along highway corridors, creates an increased risk for accidental spills and leaks that have the potential to contaminate both groundwater and stormwater runoff.

The U.S. Department of Transportation accumulated a list of commonly transported hazardous materials within the Truckee River watershed (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

Several gas stations with underground fuel storage tanks are located along the transportation corridors, which are also within Critical SWPA for several public water system wells. Based on NDEP and Washoe County Health District records, there are also numerous underground storage tank sites associated with residential heating oil in the older residential neighborhoods in the mid-portion of the watershed. Jurisdiction and Source Water Protection Areas Figure

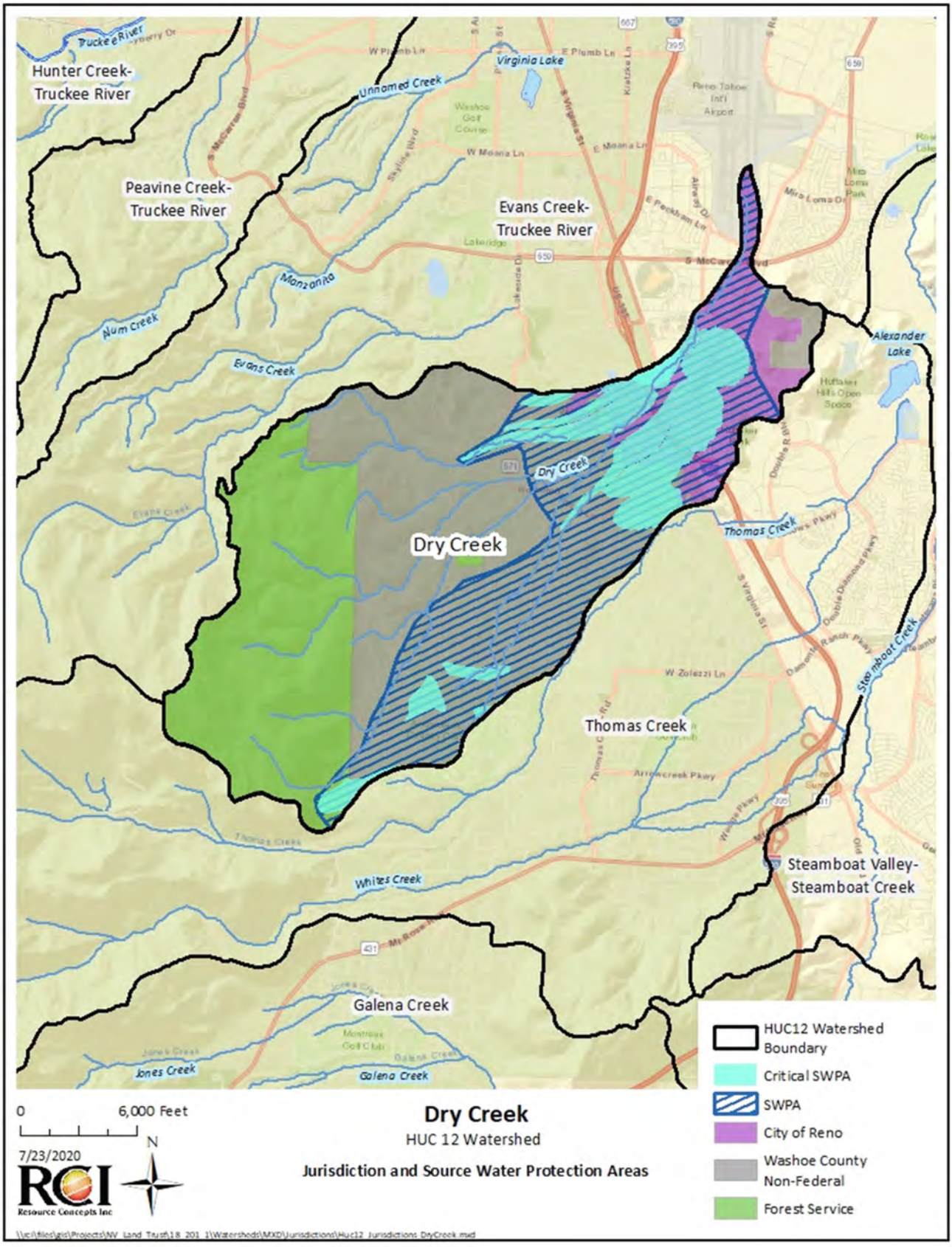
Pollution from Urban Area Runoff

The middle reach of Dry Creek is characterized by residential and some commercial development. The Arrowcreek Country Club makes up a significant part of the south western portion of the watershed. Huffaker and Crystal Lake parks are located on the north side of the watershed. Both parks are for public recreational use and provide walking trails. Pet feces, if not disposed of properly, could be contributing sources of *E. coli*. Excessive fertilization and irrigation of green areas, such as yards, fields, parks, and golf course are potential sources of nutrients that can present a groundwater quality concern.

In the central portion of the Dry Creek HUC-12 Watershed, irrigated pasture is dispersed throughout the community which consists of two to ten acres (and larger) residential parcels. Well maintained green areas provide healthy riparian habitat in most locations along the creek. However, these areas may also contribute to water quality issues from fertilizers, herbicides and livestock waste, which are commonly associated with agriculture (CDM Smith, 2015). Livestock feces might also contribute to *E. coli*. concentrations in surface waters.

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 494 parcels on septic systems in this watershed, generally associated with parcels larger than one-acre in the mid-portion of the watershed. This area is upgradient of the Critical SWPAs for several public water system wells. These parcels are also typically served by private wells. It is noted that private wells, if not correctly maintained or abandoned, can potentially introduce pollutants to groundwater.


Hunter Creek-
Truckee River
Peavine Creek-
Truckee River
Evans Creek-
Truckee River
Dry Creek
Thomas Creek
Steamboat Valley-
Steamboat Creek
Galena Creek
Virginia Lake
Unnamed Creek
Manzanita
Alum Creek
Evans Creek
Alexander Lake
Whites Creek
Jones Creek
Steamboat Creek
0
6,000 Feet
N
7/23/2020
RCI
Resource Concepts Inc
Dry Creek
HUC 12 Watershed
Jurisdiction and Source Water Protection Areas
HUC12 Watershed Boundary
Critical SWPA
SWPA
City of Reno
Washoe County Non-Federal
Forest Service

Sediment from Erosion

Sediment from erosion conveys pollution, such as phosphorous, and degrades downstream water with suspended sediment. The primary causes of erosion and sedimentation in this watershed include wildland fire, noxious weeds, and drainage and landscape modifications.

High-severity wildfires alter the overall structure of the ecosystem through the removal of vegetation leaving limited ground cover. Severe fires also create a waxy, water-repellant layer over the soil which increases water and soil runoff (NDF, 2011). The Arrowcreek Fire burned along all three tributaries in the upper Dry Creek HUC-12 Watershed in 2000. Washoe County helped restore the riparian corridors through reseeding and weed removal efforts (CDM Smith, 2015). The removal of vegetation in a fire can lead to erosion and sediment accumulation in creeks. Upslope of the creek, the desirable vegetation has not recovered from the fire due to encroachment from invasive weeds (CDM Smith, 2015).

Areas invaded by noxious weeds are more susceptible to erosion and sedimentation in several ways. Noxious weeds do not have a root structure to retain soil and resist erosion due to wind or water. The fire risk is also increased because noxious weeds are more flammable than native species. Noxious weeds are spread throughout the upper reach of the watershed. These weeds are primarily tall whitetop, yellow star thistle, medusahead, and cheatgrass (CDM Smith, 2015). Along channel banks in the middle reach there are musk thistle and bull thistle (CDM Smith, 2015). Herbicide treatments and cutting and removal of weeds has been used to prevent their encroachment (Hillside Design, 2012).

New residential and commercial development have also contributed sediment to Dry Creek, as steep channel banks have led to erosion near the confluence with Boynton Slough (CDM Smith, 2015). The lower reach is a narrow flood control channel, and, as a result, there is significant bank erosion and sedimentation (CDM Smith, 2015) despite some erosion control projects. Dry Creek channel encroachment and removal of desirable riparian vegetation may result in channel degradation and sediment transport.

Areas that are disturbed during construction projects can represent a potential risk of erosion and downstream sedimentation. Protection of stormwater runoff from contamination by construction in the Truckee Meadows is regulated under the regional stormwater management plan (Truckee Meadows MS4). There are many Best Management Practice (BMP) resources available to construction projects to help keep soil on-site and to reduce runoff.

Strategies to Protect and Improve Water Quality

The water quality concerns identified in this watershed 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 watershed 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 our sources of drinking water.

A SWPA encompasses approximately half of the watershed with buffers along the Sierra Front, an important groundwater recharge area (RCI, 2020). This buffer represents a precautionary indicator to safeguard drinking water sources. Critical SWPAs represent areas closer to streams and water system wells (based on a 20-year time of travel for groundwater). The 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 critical 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 and watershed 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

Education and outreach can be used to help effectuate positive actions to protect water quality:

- Increase knowledge of how to protect and preserve the pristine drinking water quality of this watershed.
- Increase knowledge of water quality protection and the pollution in stormwater runoff through local outreach efforts.
- Increase knowledge about household and commercial chemical use, storage and disposal.

- Inform landowners and developers for parcels 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. Washoe County, Truckee Meadow Water Authority (TMWA), NDEP, Washoe County Health District, and the Forest Service.
- Collaborate with the Washoe/Storey Cooperative Weed Management Area to support their efforts in noxious weed management (WSCWMA Website).
- Continue to increase coordination and communication between the appropriate agencies regarding spills and corrective actions along Hwy 395 and I-580.
- Evaluate how to collaborate with stakeholders such as TMWA and the Storm Water Committee on incorporating drinking water protection into community outreach and education strategies.

Wildfire and Fuel Management

Wildland fire is a threat to water quality and coordinated fuel management on wildlands can help reduce risks to water quality. Stakeholders and partners may consider the following objectives as they pertain to wildfire and fuel management:

- Encourage development, maintenance, and implementation of the Community Wildfire Protection Plans.
- Support and collaborate with the Nevada Cohesive Strategy effort and the Shared Stewardship Agreement, the blueprint to address Nevada's wildland fire issues.
- Support for the Nevada Network of Fire Adapted Communities and their local chapters for people in high fire threat locations to fully prepare themselves, their homes, and the landscape where they reside to survive the destructive force of wildfire.
- Encourage the development of wildland fire risk reduction and emergency recovery plans to reduce the risk of wildfire, quickly restore burned areas, and reduce the risk of catastrophic post-fire erosion and sedimentation.
- Collaborate and coordinate to treat invasive and noxious weeds pre- and post-fire to reduce risk of wildfire and watershed destabilization.

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:

- Efforts to increase the quantity and quality of groundwater recharge.
- 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.

Water Quality Best Management Practices

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

- Erosion reduction and sediment control measures.
- Invasive and noxious weed removal and integrated vegetation management.
- Recommendations in the tributary assessments.
- Pet waste cleanup initiatives.
- Proper abandonment of unused/orphaned wells.
- Physical improvements prioritized in SWPAs for water quality improvement and protection.
- Nutrient management plans 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 the 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 in the watershed are incorporated by reference.

Project Stakeholders	
• City of Reno • Bureau of Land Management • USDA Forest Service • Nevada Department of Transportation • Nevada Division of Environmental Protection • Nevada Division of Forestry	• Truckee Meadows Storm Water Permit Coordinating Committee • Truckee Meadows Regional Planning Agency • Truckee Meadows Water Authority • Truckee River Fund • Washoe County • Washoe County Health District • Western Regional Water Commission

City of Reno

The City of Reno 2017 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 I: Section 18.12.105 describes setbacks from the Truckee River.
- 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 watershed.

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 projects and plans within the community. Source water and watershed protection for this watershed falls within Wards 2 and 3.

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 (RMPs), that apply to this watershed. These plans generally outline the way that the BLM currently manages and intends to manage the multiple resources on public land. Within this watershed, 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 a significant issue in this watershed, management to reduce its risk is a key planning component.

USDA Forest Service

The Humboldt-Toiyabe National Forest within this watershed is managed by the Carson Ranger District. Natural resource projects, including projects undergoing NEPA documentation, are listed on the Forest Service website. The Humboldt National Forest and Toiyabe National Forest Biannual 2018 Monitoring Report describes the conditions of the watershed and present monitoring information.

Additionally, the Forest Service has created Land and Resource Management Plans (LRMP) to guide management decisions within the Humboldt-Toiyabe National Forest. Water resources are outlined in the LRMP with management actions including maintenance, monitoring and enhancement of water quality:

- Humboldt National Forest Land and Resource Management Plan:

  Section IV.C.5 is "Soil and Water within the Forest-Wide Standards and Guidelines." This outlines the goals for the soil and resources on Forest Service managed land.
  Section V.A is the "Implementation Direction of the Forest Plan." This describes how the LRMP will be analyzed for its level of success.

- Toiyabe National Forest Land and Resource Management Plan:

  Section IV is the "Forest Management Direction with Forest-wide Standards and Guidelines" for soil and water as well as riparian areas. These sections outline the goals for the forest.
  Section V is the "Implementation of the Forest Plan" including the direction of the LRMP which also outlines the goals for the Forest.

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 watershed is impacted or has the potential to be impacted by Hwy 395. 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 in order to protect public health, sustain healthy ecosystems, and contribute to a vibrant economy. The Dry Creek HUC-12 Watershed has several challenges facing source water protection, so the NDEP is an essential stakeholder and planning partner. Specifically, there are two programs under the NDEP that were involved in the Plan in Washoe County. Both programs provide education and outreach and offer funding opportunities for water quality protection and improvement:

- Integrated Source Water Protection Program under the Safe Drinking Water Bureau:

  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.

- 319 Nonpoint Source Pollution Management Program under the Bureau of Water Quality Planning:

  This Program can provide matched grant funding for projects that improve water quality.

  The 2015-2019 State of Nevada Nonpoint Source Management Plan establishes how NDEP will work with partners to address Nonpoint Pollution Source (NPS) pollution. The Plan formalizes Nevada's approach for protecting and improving water quality and describes the goals, short- and long-term objectives, milestones and timeframes to guide activities, and measures for tracking success.

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 promoting 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 preserve and 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). CWPPs 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 taking 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 should meet annually or as needed to monitor progress, develop issue resolution, address emerging issues and report out. They shall also determine the re-occurrence of the Nevada Cohesive Strategy Summit process.

- Arrow Creek Hazardous Fuels Reduction (funded 2015-2019):

  The 3,200-acre Arrow Creek community in the south west portion of the Dry Creek watershed is surrounded by 1,700 acres of open space. This area burned in 2000 and in order to prevent future wildfires this project attempts to reduce hazardous fuels. 178 acres of land was treated and continues to be monitored. Treatments included thinning brush species and removal of annual grasses through mechanical, biological, and chemical treatments. Funds for this project came from the Nevada Division of Forestry, USFS, and the community and county. Nearby creeks will benefit from reducing fuels and preventing wildfires and therefore erosion.

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 related and well head protection components. The plan was revised in 2019-2020 and is considered a living document that will evolve over time.

Truckee Meadows Storm Water Permit Coordinating Committee

The Truckee Meadows Storm Water Permit Coordinating Committee (Storm Water Committee) is responsible for implementing the Truckee Meadows Storm Water Management Program to protect the water quality of the region's waterways, streams and the Truckee River. The Storm Water Committee continues to guide the development of numerous plans and assessments relevant to source water and watershed protection as summarized below.

Ordinance and Guidance Changes for Construction and Post-Construction Programs

The Storm Water Committee updated and joined the Structural Controls Design Manual and the Low Impact Development Manual, as well as updated the Truckee Meadows Construction Site BMP Handbook. These documents are referenced in the code for the city of Reno, city of Sparks, and Washoe County.

Watershed Assessments

Watershed assessment reports prepared for the Storm Water Committee were completed by Jesch et al. from 2002-2011 that include the Dry Creek Drain. These reports provide general watershed descriptions and can be used to track historical changes in creek condition and water quality over time. The reports do not include water quality data.

Hillside Design completed a comprehensive Watershed Assessment for Tributaries to the Truckee River in 2012 for these tributaries in this watershed: Dry Creek Drain.

The assessment included:

- Stream reach descriptions with numerous photo points,
- Proper Functioning Condition rating,
- List of restoration and management efforts needed to improve stream conditions, and
- Water chemistry for temperature, pH, specific conductivity, dissolved oxygen, turbidity, and flow.

CDM Smith was contracted in 2015 through 2017 to conduct watershed assessments. The following table lists the report year and the respective drainages and reaches that were assessed in this watershed:

Stream Reaches Addressed in Watershed Assessment Reports in the Dry Creek Watershed by Report Year

Stream Name	Lower Reach	Middle Reach	Upper Reach
	2015	2015	2015
Dry	X	X	X

Watershed Management and Protection Plan for Tributaries to the Truckee River

The Watershed Management and Protection Plan for Tributaries to the Truckee River (NCE, 2020) is an update to the 2003 Watershed Management and Protection Plan for Tributaries to the Truckee River, which has been implemented for more than 15 years by the regional MS4 through the Storm Water Committee. The 2003 plan described an approach for on-going watershed assessment studies and monitoring to protect and improve the water quality in the stream corridors and drainages tributary to the Truckee River. The 2020 Plan update provides a process and framework for identifying, developing, and implementing projects originated through the Storm Water Committee that is consistent with the guidelines for an EPA approved Watershed Management Plan. The 2020 plan by NCE and the 2020 Integrated Source Water and 319(h) Watershed Protection Plan for Public Water Systems and the Truckee River in the Truckee Meadows are mutually complementary and work together to address the broad scope of potential strategies to improve drinking water and surface water quality in Washoe County.

Truckee Meadows Watershed Protection Manual

This manual contains a Summary of the Watershed Protection Activities and Programs Developed in Conjunction with the Watershed Management Facilitator Scope of Work (Kennedy/Jenks, 2005). This document provides a reference and compendium of the various watershed protection activities and programs that were developed in 2004 and 2005 for Reno, Sparks and Washoe County.

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 watershed. 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. Additionally, this plan provides useful Truckee River watershed information.

- 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.

Truckee River Fund

TMWA established the Truckee River Fund in 2004 (Truckee River Fund). The purpose of the Fund is to "protect and enhance water quality or water resources of the Truckee River, or its watershed." The Fund provides a way to respond to the requests from outside groups and organizations that are involved in promoting and improving the health of the Truckee River System and watershed. This in turn benefits the primary water source for the community and, in the long run, benefiting TMWA customers. For example, the Truckee River Fund has been the financial source for a portion of the following project:

- Truckee Meadows Nature Study Area Project: Planning Phase; (funded 2018-2019):

  This project involves the repurposing of the Rosewood Lakes Golf Course into a public recreational park and learning center. This specific area in the Dry Creek watershed has high quality wetland habitat. Funding, granted to the Truckee Meadows Parks Foundation, has helped create this outdoor classroom which will support volunteer and educational programs related to restoration and spreading awareness of water quality and watershed protection. Funding from TRF has also helped weed removal at the Truckee Meadows Nature Study Area where weeds like tall whitetop, poison hemlock, and purple loosestrife will be removed, and techniques and success of removal will be monitored. Efforts from developing this wetland area will potentially reduce total nitrogen loading on the Truckee River, and reduce erosion and weed encroachment near Steamboat Creek.

Washoe County

Activities in Washoe County are reviewed according to the Master Plan Planning Areas. The Truckee River watershed includes nine planning areas. The Dry Creek HUC-12 Watershed is included in the three planning areas: Northwest Truckee Meadows, Southeast and Southwest Truckee Meadows. The County has Citizens Advisory Boards (CABs) which provide important community perspective on local issues to the Washoe County Board of Commissioners. This watershed includes portions of the North Valleys CAB, West Truckee Meadows/Verdi CAB, and the South Truckee Meadows Washoe Valley 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 in the watershed.

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.

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).

References

CDM Smith, Watershed Assessment for Tributaries to the Truckee River. Prepared for the Truckee Meadows Storm Water Permit Coordinating Committee, 2015,2016,2017. CDM Smith, 2016

City of Reno 2018 Master Plan. Adopted December 13, 2017. City of Reno 2018 Master Plan

City of Reno. Ward Map. City of Reno Ward Map

Hillside Design, LLC. Watershed Assessment for Tributaries to the Truckee River. Prepared for the Truckee Meadows Stormwater Permit Coordinating Committee, 2012. Hillside Design, 2012

Jesch et al. Washoe County Department of Water Resources. Watershed Assessments for Tributaries to the Truckee River. Prepared for the Truckee Meadows Storm Water Permit Coordinating Committee. 2002,2003,2005,2006,2007,2008, 2010,2011. Jesch 2002, Jesch 2003, Jesch 2005, Jesch 2008, Jesch 2010, Jesch 2011

Kennedy/Jenks Consultants, Truckee Meadows Watershed Protection Manual: A Summary of the Watershed Protection Activities and Programs Developed in Conjunction with the Watershed Management Facilitator Scope of Work. Prepared for City of Reno, City of Sparks, Washoe County, Regional Water Planning Commission, and Nevada Division of Environmental Protection, 2005.

NCE, Nichols Consulting Engineers. 2020 Watershed Management and Protection Plan for Tributaries to the Truckee River. Prepared for the Truckee Meadows Stormwater Permit Coordinating Committee.

NDEP BWQP, Nevada Division of Environmental Protection, 2016-2018. Nevada 2016-2018 Water Quality Integrated Report

NDEP, Nevada Integrated Source Water Protection Program, 2010. Nevada Integrated Source Water Protection Program

NDF, Nevada Division of Forestry. Nevada Natural Resources and Fire Information Portal Area of Interest Summary Report. U.S. Forest Service Forests to Faucets project, 2011. Weidner, 2011. Retrieved February 2019 from Forests to Faucets Weidner 2011. NV Natural Resources and Fire Information Portal

NDOT, Nevada Department of Transportation. Stormwater Quality Manuals. Planning and Design Guide, 2017. NDOT Construction Site BMP Manual, NDOT Planning and Design Guide 2017

Northern Nevada Water Planning Commission. Northern Nevada Water Planning Commission

OTR, One Truckee River. One Truckee River Management Plan. Phase 1 West McCarran to Sparks Boulevard, 2017. One Truckee River Management Plan

Resource Concepts, Inc. (RCI), 2020 Integrated Source Water and 319(h) Watershed Protection Plan for Public Water Systems and the Truckee Meadows in the Truckee Meadows, 2020. http://www.rci-nv.com/source_water_protection/

TMRPA, Truckee Meadows Regional Planning Agency. Truckee Meadows 2019 Regional Plan. Truckee Meadows Regional Planning Agency

TMSWPCC, Truckee Meadows Storm Water Permit Coordinating Committee. Truckee Meadows Storm Water Permit Coordinating Committee

TMWA, Truckee Meadows Water Authority, 2016-2035 Water Resource Plan. Appendix 2-9 Basin Summaries, 2016. TMWA 2016-2035 Water Resources Plan Volume III

TMWA. Truckee River Fund. Truckee River Fund

United States Forest Service Biennial Monitoring and Evaluation Report. Humboldt National Forest Land and Resource Management Plan, 2018. 2018 USFS Humboldt Biennial Monitoring & Evaluation Report

United States Forest Service Biennial Monitoring and Evaluation Report. Toiyabe National Forest Land and Resource Management Plan, 2018. 2018 USFS Toiyabe Biennial Monitoring & Evaluation Report

United States Forest Service Humboldt Toiyabe National Forest Carson District website. United States Forest Service Carson District

Washoe County Master Plan, 2008. Washoe County 2008 Master Plan, Washoe County Health District

Washoe/Storey Cooperative Weed Management Area. WSCWMA Website

Water Research Foundation, Environmental Protection Agency. Effects of Wildfire on Drinking Water Utilities and Best Practices for Wildfire Risk Reduction and Mitigation, 2013. Effects of Wildfire on Drinking Water Utilities

WRWC, Western Regional Water Commission, Comprehensive Regional Water Management Plan 2016-2035 Update, 2017. WRWC Comprehensive Regional Water Management Plan 2016-2035