WESTERN REGIONAL WATER COMMISSION

Northern Nevada Water Planning Commission

2016-2035 Comprehensive Regional Water Management Plan

April 19, 2017

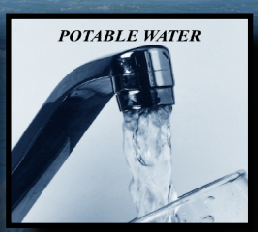

Photo by June Davis

2016 – 2035

Comprehensive Regional Water Management Plan

April 19, 2017

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Requirement	Action
1. Northern Nevada Water Planning Commission public hearing and recommendation to Western Regional Water Commission Board of Trustees for approval and adoption, Sec. 45, Chapter 531, Statutes of Nevada 2007	Public hearing and recommendation by Resolution No. 17-1 on March 1, 2017
2. Western Regional Water Commission Board of Trustees public hearing and adoption of Plan, Sec. 46, Chapter 531, Statutes of Nevada 2007	Public hearing and adoption by Resolution No. 5 on April 19, 2017
3. Truckee Meadows Regional Planning Commission review for consistency with the Truckee Meadows Regional Plan, Sec. 43, Chapter 531, Statutes of Nevada 2007	Public hearing and finding of consistency on September 13, 2017

Executive Summary

1. Introduction

The Western Regional Water Commission ("WRWC") was created in 2007, effective April 1, 2008, by the Nevada Legislature, and by Cooperative Agreement among the WRWC member agencies. Chapter 531, Statutes of Nevada 2007, the Western Regional Water Commission Act (the "Act") also created the Northern Nevada Water Planning Commission ("NNWPC") and required the NNWPC to develop a comprehensive regional water management plan for the Planning Area covering municipal and industrial water supply, water quality, sanitary sewerage; sewage treatment, storm water drainage and flood control. The overall purpose is to deal with current and future problems affecting the Planning Area as a whole with respect to the subjects of the plan. The Act further required the NNWPC to develop the initial *Comprehensive Regional Water Management Plan ("Regional Water Plan")* on or before January 1, 2011.

The *Regional Water Plan* compiles and integrates multiple sources of information in an effort to be inclusive, provide comprehensive, consistent policy-level guidance to regional and local entities and comply with the Act. The plan development process provided a broad level of coordination, data sharing and alternatives analysis that would not have otherwise occurred. The *Regional Water Plan* is not an enforcement-oriented plan and relies on the cooperation and collaboration of the WRWC member agencies, NNWPC members and local and regional government planning agencies for implementation.

Among the most valuable elements of the *Regional Water Plan* is the development of goals and policies to deal with current and future problems affecting the Planning Area. These policies provide a set of consistent guiding principles for public purveyors, other service providers and local and regional government planning agencies to consider when developing their plans and reviewing the plans of others.

Outcomes of plan implementation should include cost-efficient, integrated water-related services provided by public purveyors and local governments to current and future citizens of the Planning Area.

2. Policies

Background

The Act includes among the required contents of the *Regional Water Plan*, appropriate goals and policies to deal with current and future problems affecting the Planning Area. This Plan identifies the Planning Area's water-related needs over a 20-year timeframe, the constraints on meeting those needs and pertinent background information. To adequately evaluate alternatives for meeting the Planning Area's needs and to evaluate future projects for conformance with this Plan, the following policies will apply for the supply of municipal and industrial water, sanitary sewerage, treatment of sewage, drainage of storm water, and control of floods.

Goal 1: Plan for the Development of Sustainable Water Supplies

Objective 1.1 Promote Efficient Use of Resources

Policy 1.1.a: Geographic Use of Truckee River Water

Use of Truckee River water rights in additional hydrographic basins shall conform to the Regional Water Plan if such uses are an efficient use of water resources; meet or satisfy all regulatory requirements and operating agreements; maintain or improve water quality for downstream users and maintain a healthy river environment, recreational opportunities, and economic development.

Policy 1.1.b: Water Conservation

Water conservation measures that promote smart and efficient use of the Planning Area's water resources will be implemented for the benefit of the community. Additionally, the community will be expected to reduce water use during low precipitation years when upstream reserves are needed to release water prior to September 1.

Policy 1.1.c: Reduction in the use of Truckee River Water resulting from demand-side management programs (DMPs)

Truckee River water saved as a result of DMPs shall be managed consistent with agreements among local entities and parties of interest to the Truckee River.

Policy 1.1.d: Evaluation of the Unexercised Portion of Committed Water Supplies

The feasibility of alternative uses and management of the unexercised portion of committed water supplies shall be evaluated. This appropriated but unused water could possibly be dedicated to a variety of beneficial uses.

Objective 1.2 Provide for a Sustainable Water Supply and an Acceptable Level of Service to the Community

Policy 1.2.a: Conjunctive Management of Surface Water and Groundwater Supplies to withstand an 8-year Drought Cycle

For planning purposes, the conjunctive management of TROA-reliant surface and ground water supplies for municipal and industrial use in the greater Truckee Meadows area shall be designed to withstand the worst drought cycle of record, that being the drought of 1987-1994.

Policy 1.2.b: Water Resource Investigations

Where a water supply deficiency exists or a potential water supply deficiency may occur as a result of master plan, zoning or land use changes or changes to the Truckee Meadows Service Area boundary, or there is a need for additional water resources to meet other regional objectives, the NNWPC may investigate alternatives to meet the potential water requirement.

Policy 1.2.c: Emergency Water Supply Standard

Water service providers using Truckee River water rights supplemented with other water resources shall design and manage their supplies to meet all indoor water uses, and withstand a short-term contamination event (1-2 days) with no interruption in service, and a seven-day event through the use of mandatory conservation..

***Policy 1.2.d:* Protection and Enhancement of Groundwater Recharge**

Natural recharge areas shall be defined and protected for aquifer recharge. Applicants for proposed projects and proposed land use changes in areas with good recharge potential shall be encouraged to include project features or adequate land for passive recharge.

Policy 1.2.e: New Water Resources/Importation

New water resources, including imported water or potable reuse supply, may be developed provided they further the goals of the Regional Plan and the Regional Water Plan.

Policy 1.2.f: Water Resources and Land Use

Land use designations or zoning designations do not guarantee an allocation of future water resources. This applies to both surface water and groundwater, including groundwater for domestic wells. While a potential water supply deficiency may exist based on approved land uses, water supply commitments may only be approved pursuant to Policy 1.2.g.

Policy 1.2.g: Water Resource Commitments

Issuance of new commitments against a water resource or combination of resources shall be made in conformance with existing State Engineer permits, certificates or orders; water purveyor rules or policies; and/or local government policies. The local governments, water purveyors, and State Engineer will seek to achieve a balance between commitments and the sustainable yield of the resources in the region.

Policy 1.2.h: New Water Purveyors

For those areas outside of any hydrographic basin containing TMWA owned water delivery systems, new private water systems must be under the Public Utilities Commission of Nevada ("PUCN").

Objective 1.3 Implement Measures to Protect and Enhance Water Quality for a Sustainable Water Supply

***Policy 1.3.a:* Treated Water Supplies to Meet Safe Drinking Water Act Requirements**

All drinking water supplies provided by public water systems shall meet or exceed the requirements of the Safe Drinking Water Act.

Policy 1.3.b: Wellhead Protection

To protect public health and to ensure the availability of safe drinking water, the Washoe County Health District (for domestic wells) or local governments with input from TMWA shall review any proposed project that may cause possible groundwater contaminating activities. TMWA has and maintains its wellhead protection program and coordinates with local government review processes for new business or development

Policy 1.3.c: Groundwater Resource Development and Water Quality

Existing and proposed municipal and industrial well sitings must be evaluated for their influence on the potential for contaminated groundwater migration to areas of potable groundwater. Also, development of groundwater resources shall not result in deterioration of groundwater quality through migration of contaminants..

Policy 1.3.d: Corrective Action for Remediation of Groundwater

The corrective action taken for remediation of groundwater contamination is typically driven by public health and environmental concerns, and applicable local, state and federal regulations. Realizing this, the affected community shall consider the cost and level of cleanup for groundwater remediation.

Goal 2: Plan for Regional Wastewater Treatment and Disposal Requirements

Objective 2.1 Promote Efficient Use of Resources

Policy 2.1.a: Effluent Reuse - Efficient Use of Water Resources and Water Rights

The use of reclaimed water for irrigation, recharge or other permitted uses should be pursued where such use is an efficient use of water resources and water rights.

Policy 2.1.b: Reduction of Non-Point Source Pollution for TMWRF Pollutant Credit

Options for centralized wastewater treatment with surface water discharge shall include alternatives for reducing non-point source pollution, which may be more environmentally sensitive, and where appropriate should be pursued as pollutant credits for Truckee Meadows Water Reclamation Facility ("TMWRF").

Objective 2.2 Manage Wastewater for Protection and Enhancement of Water Quality

Policy 2.2.a: Septic Tank Density and Groundwater Pollution

Future development using septic systems should not be allowed in densities that would risk groundwater or surface water quality degradation such that applicable water quality standards are threatened. When adverse surface water or groundwater impacts occur as a result of existing or proposed increases to the concentration of septic systems in an area, alternative sewage disposal, groundwater treatment, or other mitigation measures must be implemented based on cost, longevity of the solution, and existence of a credible entity to be responsible for the continuing performance of the selected system.

Goal 3: Plan for the Protection of Human Health, Property, Water Quality and the Environment through Regional Flood Plain and Storm Water Management

Objective 3.1 Effective and Integrated Watershed Management

Policy 3.1.a: Regional Flood Plain Management Plan for the Truckee River

The NNWPC will review the regional Flood Plain Management Plan for the Truckee River watershed and forward its recommendations to local governments.

Policy 3.1.b: Flood Plain Storage within the Truckee River Watershed

Until such time as Reno, Sparks, and Washoe County adopt and begin to implement a Flood Plain Management Plan for the Truckee River, the local flood management staff[1], using the best technical information available and applicable local ordinances, will work with a proposed project applicant or a proposed land use change applicant to determine the appropriate level of analysis required in order to evaluate and mitigate the impacts experienced during the 1997 flood. On an annual basis, all three local flood management agencies and the Flood Project shall jointly agree on and adopt the "best technical information" available for use in implementation of this policy.

Policy 3.1.c: Flood Plain Storage outside of the Truckee River Watershed

As appropriate, the local flood management staff will work with proposed project applicants or proposed land use applicants to identify the best approach to mitigate the impacts of changes to 100-year flood peaks and flood plain storage volume that are a result of proposed land use changes or proposed projects.

Policy 3.1.d: Truckee River Restoration

In review of proposed projects and proposed land use changes within the areas identified for restoration in Figures 5-4 and 5-5, the local governments shall make findings supporting the implementation of potential restoration projects as identified in the Lower Truckee River Restoration Plan or the Truckee River Flood Project being developed in conjunction with the Army Corps of Engineers ("ACOE").

Policy 3.1.e: Watershed Protection

Watershed protection programs shall be implemented for the Truckee River, its tributaries, and other perennial streams in the region.

Policy 3.1.f: Adoption of Storm Water Quality Programs

A storm water quality program shall be implemented region-wide, including the continuation and/or enhancement of existing programs in Reno/Sparks/Washoe County, such as the Truckee Meadows Regional Storm Water Quality Management Program, to address not only urban runoff but also other non-point sources.

[1] Each local government has assigned one or more staff members the responsibility of designing and reviewing flood management projects. These staff members are also responsible for reviewing certain proposed projects to address concerns of drainage and flooding.

Policy 3.1.g: Management Strategies for Slopes Greater than 15 Percent

Local government management strategies for hillsides with natural slopes greater than 15 percent and less than 30 percent shall be submitted to the NNWPC for review, comment, and recommendations prior to incorporation into local government master plans.

Policy 3.1.h: Adoption of Storm Water Drainage Guidelines

Regional guidelines for storm water hydrologic criteria and drainage design shall be pursued to address, to the extent practicable, inconsistencies between local governments' existing criteria and design standards.

Policy 3.1.i: Flood Plain Management / Flood Control Projects Subject to NNWPC Review

Facility plans and infrastructure studies for flood control projects developed by local governments will be reviewed by the NNWPC according to Policy 4.1.a to ensure coordination of local projects with regional water management objectives, including but not limited to, regionally coordinated flood damage reduction, preservation or enhancement of recharge, preservation of natural drainage ways, preservation of riparian habitat, protection or enhancement of surface and groundwater quality.

Goal 4: Support the Implementation of the Truckee Meadows Regional Plan

Objective 4.1 Coordinated Infrastructure Planning

Policy 4.1.a: Facility Plans – Conformance with Regional Water Plan

Pursuant to Section 51 of the Act, facilities of a kind or size that affect the working of the Regional Water Plan as distinct from providing normal service to customers, including water supply and storage, wastewater collection and treatment, storm water, and flood control, shall be reviewed by the NNWPC for conformance with the Regional Water Plan, and recommended to the WRWC.

Policy 4.1.b: Timing and Sizing of Facilities

To the extent allowed by state statutes, local codes and ordinances, planning for facilities (defined in the Act) shall be based on existing data and forecasts of future trends, including conservation, to ensure that facilities will be built pursuant to local entities' Capital Improvement Programs ("CIPs") with sufficient lead-time to ensure public demands are met.

Policy 4.1.c: NNWPC Programs and Policies to Reinforce Goals of the Regional Plan

All the policies and criteria for facility plan review adopted by the NNWPC shall be consistent with and carry out the provisions of the Regional Plan.

Policy 4.1.d: Inclusion of Non-Economic Criteria in Evaluation of Alternatives

Non-economic criteria including, but not limited to, environmental impact, public impact, and archeological impact will be evaluated during the program or project alternative selection process.

Policy 4.1.e: Economic Decision-Making Criteria

NNWPC recommendations regarding economic decisions shall be, to the extent possible, based on minimizing the costs to the entire community for providing adequate services as defined by the policies and criteria of this Plan.

Policy 4.1.f: Examination of Long-Term Impact on Availability of Water Resources

In considering water, wastewater, and flood control projects or management options, the long-term impact on the availability of water resources shall be examined.

Objective 4.2 Clarification of the Role of the WRWC and the NNWPC

Policy 4.2.a: Role of NNWPC in Water Related Issues

The NNWPC shall address a water-related matter, consistent with its responsibilities as described in the Act.

Policy 4.2.b: Role of WRWC in Water Related Issues

The WRWC shall address a water-related matter, consistent with its purposes, powers and responsibilities as described in the Act.

3. Findings

The *Regional Water Plan* contains numerous findings relative to the subjects of the Plan, which are summarized below.

Water Resources

For 20-year regional planning purposes, sustainable water resources are estimated at approximately 190,580 acre feet annually ("afa"), including resources presently dedicated for municipal and industrial ("M&I") uses and those that may be converted from other uses to M&I. This planning-level estimate of available resources, however, should not be considered a commitment to, nor a guarantee of, the availability of a water allocation for any specific project or parcel.

Recent data show that more than 37,000 afa of effluent water is generated in the Planning Area of which up to approximately 6,000 afa is used for non-potable purposes such as irrigation, construction and dust control; the remainder is returned to the Truckee River, discharged to Swan Lake wetlands or to the ground via infiltration basins. The Nevada Division of Environmental Protection ("NDEP") has developed amendments to its reclaimed water regulations that allow for groundwater augmentation with highly treated effluent.

The Orr Ditch Decree, issued in 1944, established the number of water rights associated with the Truckee River and all its tributaries by reach, priority, owner and quantity. It is important to note that although surface water rights can be subdivided and/or converted from one use to another, for example from agriculture to M&I use, the overall total number of surface water rights available from the Truckee River has not changed from the amount defined in the Decree.

The primary water rights that applicants for new water service dedicate to the Truckee Meadows Water Authority ("TMWA") are mainstem Truckee River water rights. Although the number of remaining Truckee River mainstem irrigation water rights available for conversion to M&I use continues to decrease, an analysis in TMWA's *2016-2035 Water Resource Plan* ("2016-2035 WRP") shows that over 46,000 acre-feet ("af") of Truckee River mainstem rights are potentially available for dedication to TMWA to support future will-serve commitments, and this amount is more than enough to meet TMWA's future water rights requirements through the 20-year planning horizon.

The *Truckee River Operating Agreement* ("*TROA*") allows for a congressionally authorized interstate allocation of water and change to the operation of the Truckee River system to accommodate multiple beneficial uses for drought supply, endangered and threatened fish species, water quality, California water use, and storage. In addition, operations will enhance riparian habitat, reestablish river canopy, enhance reservoir releases, improve recreational pools in the reservoirs, and improve the process for emergency drawdown procedures for Lake Tahoe.

TROA was signed on September 6, 2008 by the Mandatory Signatory Parties (TMWA, Pyramid Lake Paiute Tribe ["PLPT"]), California, Nevada, and the United States ["U.S."]) and seven other parties; all conditions to implement TROA were finally completed in the fall of 2015.

A total of 8,000 afa of groundwater is currently available for importation from the Honey Lake Valley hydrographic basin to Lemmon Valley by way of existing infrastructure. The timing of such groundwater importation will depend on future land development projects.

Threats to the reliability of the Planning Area's water supply are weather and source water supply contamination, both of which may affect the quantity and quality of available water supplies. Numerous programs are in place within the Planning Area to address existing problems and threats having the potential to affect available water supplies..

Water Purveyors and Other Water Providers

There are currently two public water purveyors within the Planning Area; the Truckee Meadows Water Authority ("TMWA") and the Sun Valley General Improvement District ("SVGID"). These two purveyors provide 95 percent of the municipal water service within the Planning Area.

As of December 31, 2014, the Washoe County water utility and the South Truckee Meadows General Improvement District ("STMGID"), which relied on Washoe County for utility operation and maintenance, were consolidated into TMWA.

A small number of privately owned public utilities exist in the Planning Area, which are regulated by the Public Utilities Commission of Nevada ("PUCN"). Numerous other small private water systems exist which are solely regulated by the Washoe County Health District ("WCHD"). These systems are typically associated with commercial businesses which do not have municipal water service available.

Approximately 9,100 residential parcels within the Planning Area rely on individual wells for domestic water supply. The use of domestic wells is allowed for parcels where municipal service is not available. A concern regarding domestic wells has been development in certain areas where withdrawal of groundwater has resulted in the lowering of the water table. A variety of

steps have been taken to address the issue including restrictions on development of parcels in certain hydrographic basins, which require retirement of water rights and restrictions on subdividing existing parcels without the dedication of water rights.

There are three reclaimed water purveyors within the Planning Area; the City of Reno ("Reno"), the City of Sparks ("Sparks") and Washoe County Utilities ("WCU"). Reno and Sparks co-own the Truckee Meadows Water Reclamation Facility ("TMWRF"), which supplies approximately 4,000 acre-feet ("af") of reclaimed water per year to the Reno-Sparks reclaimed water distribution systems. In addition, the Reno-Stead Water Reclamation Facility ("RSWRF") supplies approximately 500 af of reclaimed water per year to Reno's Stead reclaimed water system. Washoe County owns and operates the South Truckee Meadows Water Reclamation Facility ("STMWRF"), which supplies 100 percent of its effluent, approximately 2,300 af of reclaimed water per year, to the WCU reclaimed water system in the South Truckee Meadows

Wastewater and Watershed-Based Water Quality Planning

Facilities
The five publicly owned wastewater treatment facilities in the Planning Area each process sewage at average daily flows below maximum capacities.

Effluent Management
The informal Regional Effluent Management Team is working toward regionally-based solutions to several near-term effluent management issues; acknowledging that the strategies developed may form the framework for an up-to-date regional effluent management master plan that will cover all of the Planning Area's publicly-owned water reclamation facilities and service areas.

Near-term effluent management issues focus on reducing nitrogen loading to the Truckee River by maximizing the use of Truckee Meadows Water Reclamation Facility ("TMWRF") reclaimed water at locations away from the river in allowable quantities and during appropriate times of the year, while maintaining a balance with Truckee River flows consistent with State water law and the Truckee River Operating Agreement ("TROA").

Expanded use of reclaimed water could include locations outside the Truckee Meadows Service Area ("TMSA") and uses such as groundwater recharge or indirect potable reuse. Such uses are being studied with respect to regulatory issues, treatment technologies and public perception.

The State of Nevada has approved "exceptional quality" standards for reclaimed water that will offer regional long-range water supply resiliency benefits. Criteria for exceptional quality reclaimed water, achieved through a series of advanced water treatment and natural processes, are included in State regulations to permit the use of reclaimed water for groundwater augmentation.

Septic Systems
The Septic Nitrate Baseline Data and Risk Assessment Study, Phase II prioritized nine areas (Mt. Rose, Ambrose, Hidden Valley, Huffaker, Verdi, Geiger, Island 18, Mogul, and Pleasant Valley) needing more in-depth analysis to fill data gaps identified in Phase I. Of 173 groundwater samples collected in 2014 and 2015 from domestic wells in the nine study areas, only two domestic wells, located in the Mt. Rose and Verdi areas, recorded nitrate levels above the maximum contaminant level ("MCL") of 10 milligrams per liter ("mg/L").

Samples collected from areas of known impact, but which had not been sampled for 10 to 20 years, including Washoe Valley, Cold Springs and Heppner subdivision in Lemmon Valley confirmed past conclusions. Twenty-two of 83 samples from Washoe Valley were above the MCL and the highest was 50 mg/L. Of the 33 samples from Heppner, five were above the MCL with a high of 19 mg/L. In Cold Springs, none of the 17 samples were above the MCL.

In July 2016, the Washoe County Community Services Department ("WCSD") distributed approximately 5,000 informational letters to domestic well owners within or in the vicinity of each of the 12 Phase II study areas. The letters serve as a resource guide to educate homeowners on nitrate in groundwater and provide a summary of nitrate concentrations found within their study area.

Results of this study and previous studies point to the importance of septic system density, parcel size and distance to sensitive receptors.

Conversion of septic systems to a municipal sewer system appears to be the most reliable, albeit expensive, measure to mitigate nitrate contamination due to high densities of septic systems. Artificial groundwater recharge using fresh water injected into the aquifer, such as in Golden Valley, has also proven beneficial in improving water quality with respect to nitrate.

Watershed/Water Quality
Total nitrogen ("TN") and total phosphorus ("TP") water quality criteria for the Truckee River were developed by the Nevada Division of Environmental Protection ("NDEP") initially in the 1970s. The current standards were set in 1984.

In 1994, the NDEP established Total Maximum Daily Loads "(TMDLs") for TN and TP and total dissolved solids ("TDS") in the Truckee River.

The NDEP and the United States ("U.S.") Environmental Protection Agency ("EPA") agreed that a third-party review of the 1994 TMDLs is appropriate to determine whether the assumptions underlying the 1994 TMDLs remained valid, and to identify new scientific and technical information and/or changes in conditions and river operations that may warrant a different approach to addressing nutrient issues in the watershed. A third-party review was initiated in the mid-2000s

In 2015, the Pyramid Lake Paiute Tribe ("PLPT") conducted a Triennial Review of water quality standards ("WQS") and presented rationale for proposed changes to certain standards, including a significant change to the dissolved reactive phosphorus ("DRP") criterion for the Truckee River, reducing it from 0.05 mg/L to 0.022 mg/L. The proposed reduction of the DRP criterion for the Truckee River was implemented in 2015.

Considering the revised PLPT DRP criterion, it is highly unlikely that the NDEP TP criterion would be revised to a value higher than the PLPT criterion because WQS from upstream jurisdictions must maintain compliance with WQS for downstream jurisdictions. To date, the third parties have taken no further action concerning the review of the NDEP TMDLs.

The current Storm Water National Pollutant Discharge Elimination System ("NPDES") permit was issued to the City of Reno ("Reno"), the City of Sparks ("Sparks") and Washoe County on May 26, 2010. A renewed permit is expected in 2017.

The Truckee Meadows Storm Water Permit Coordinating Committee ("SWPCC"), established among Reno, Sparks and Washoe County by interlocal agreement, is responsible for permit compliance. The purpose of the committee is to define responsibilities and funding options for implementing the required components of the permit, and to submit annual reports to the NDEP and the EPA.

Based upon conversations with the NDEP and observations of national regulatory trends, the SWPCC anticipates that there will be a waste load allocation ("WLA") assigned to Truckee Meadows storm water in the future.

Flood Management and Storm Water Drainage

The properties at risk from a 100-year flood in the Truckee Meadows were valued by Washoe County in 2004 at approximately $5 billion using a geographic information system ("GIS") compilation of the 1997 flood boundary and the assessed value for parcels within the boundary. A 2007 analysis by the Nevada Bureau of Mines and Geology ("NBMG") using a Federal Emergency Management Agency ("FEMA") loss estimation model to estimate 100-year flood risk in Washoe County estimated building exposure, a measure of the economic wealth of the county, at $25 billion and building-related economic losses at $980 million (NBMG, 2007).

Physical damages and economic impacts resulting from the 1997 Truckee River flood (the largest flood of record) totaled about $700 million[2] in Washoe County and $1 billion in the six-county area hit by the flood in northern Nevada.

Nevada ranks highest in flood loss payments from the National Flood Insurance Program ("NFIP") for western, non-coastal states for the last 30 years (January 1, 1978 through November 30, 2009 including Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming).

Over the last 30 years, Sparks, Reno, and Washoe County rank number one, number two, and number three, respectively, for the total amount of flood insurance payments in Nevada from the NFIP.

Together, the three areas account for 74 percent of the total flood loss payments in Nevada or almost three times more than all other areas in Nevada combined for the last 30 years ($27,651,343 vs. the statewide total of $37,370,575).

Riverine flooding and alluvial fan flooding are both common in northern Nevada. Riverine flooding occurs when flows in rivers and streams rise over a period of hours or days and overtop stream banks inundating nearby flood plains and low-lying areas. Alluvial fan flooding occurs when floodwaters emerge from canyons flowing out of the upper mountains onto an alluvial fan, typically with little or no warning, and travel downstream at very high velocities carrying significant loads of sediment and debris.

[2] In 1997 dollars. The Army Corps of Engineers ("ACOE") estimated physical National Economic Development ("NED") Plan damage at approximately $500M. The Truckee River Water Management Council did an economic impact study that concluded total damage to be $780M.

Incorporation of hydrologic data since the mid-1980s has resulted in estimated peak flow for specific frequency events higher than originally thought. The 100-year flood event (or one-percent risk flood) at Reno is now estimated to be 20,700 cubic feet per second ("cfs"). Peak flows for certain frequency events are shown in Table 5-1.

These flows can change direction and realign the existing channel through the alluvial fan as the energy of the water erodes small channels, water is diverted over un-channeled ground, and new channels are established.

Table 5-1 Estimated Peak Flows – Truckee River at Reno

Exceedance (i.e., chance of occurrence in any single year)	Peak Flow (cfs)
1/20	9,200
1/50	14,800
1/100*	20,700
1/500	63,000

Source: ACOE

* Flooding that has a one-percent chance of being equaled or exceeded in any given year, also referred to as a 1 in 100-year flood event or a 100-year flood. Note: The USGS, using a different analysis technique to account for upstream reservoirs estimates the 1/100 peak flow to be approximately 26,000 cfs.

In the 1985 feasibility report for the Flood Project, the estimated discharge for the 100-year event at Reno was computed at approximately 18,500 cfs. This flow has been used by FEMA to identify areas subject to flooding for flood insurance purposes.

The peak water surface elevation for the January 1997 flood, considered to be slightly greater than the 100-year flood event, was approximately 1.6 feet higher than the existing FEMA base flood elevation at the Vista gage. Therefore, the actual 100-year flood levels are higher than those shown on FEMA flood maps especially in the area east of United States ("U.S.") Highway 395, with the greatest difference occurring east of McCarran Boulevard. Structures built to current FEMA standards within the area approximately bounded by Rock Boulevard, Interstate 80, and Mira Loma Boulevard are not necessarily protected during a 100-year flood event despite the depictions on the FEMA flood maps.

Information prepared for the Regional Water Planning Commission ("RWPC") through a study by WRC Nevada, Inc. in 2003 indicates that loss of flood storage volumes due to development of existing approved land uses within the flood plain on the north and south sides of the Truckee River could result in an increase of 0.4 to 0.6 feet in the base flood elevation. Since this study looked only at development that might occur outside of the floodway and in areas zoned for development at that time, placing fill in the flood plain would result in even higher flood levels than predicted if there were changes in zoning and acceptable land uses.

As land uses change in the Truckee River watershed, both runoff volumes and velocity of flows typically increase. This is reflected in changes in the shape and size of the hydrographs of flows entering the Truckee River at places such as the North Truckee Drain, Boynton Slough, Dry Creek, Evans Creek, and Steamboat Creek. Without mitigation, these changes could affect the functioning of the Flood Project by causing higher peak flood elevations, thus reducing the effectiveness of the project and reducing the level of protection.

In 1997, approximately 120 to 150 homes were inundated above the first floors. Information prepared by participants in the Flood Project Working Group indicates that an increase in the base flood elevation of as little as two or three inches over the 1997 flood event could result in the inundation of approximately 1,800 additional homes in the Steamboat Creek area under the same flooding conditions. Other properties throughout the region would likely be subject to additional damages (Flood Project staff, personal communication).

FEMA maps were adopted for the region in 1984. Local ordinances were adopted shortly thereafter requiring the first floor of structures to be elevated either one or two feet above the FEMA base flood elevation. Structures constructed after 1984 were generally built in compliance with these ordinances and are at less risk of flooding, while structures constructed prior to 1984 are at higher risk. However, many of the current FEMA flood maps are off by 0.5 to 1 foot as demonstrated in the 1997 flood, during which some homes experienced flooding unexpectedly.

Population Forecast and Projections of Water Demand, Peak Day Requirements and Wastewater Flow

The Western Regional Water Commission ("WRWC") determined in 2016 that the Consensus Forecast population for 2036 can be supported by the sustainable water resources set forth in the Regional Water Plan. It is acknowledged that 2036 is beyond the 2035 planning horizon of this RWMP. The most recent version, the 2016 Consensus Forecast, projects that the total population in Washoe County will grow from 450,747 in 2016 to 548,159 in 2036. It was determined, since the TMRPA had submitted the draft 2036 forecast, and the WRWC had conducted the comparison with sustainable water resources prior to the public review process for this RWMP, that the 2036 estimates and conclusions would be appropriate for inclusion in Section 6.1 only.

The Washoe County Consensus Forecast is in close agreement with TMWA's 20-year population forecast. Disaggregation of the Consensus Forecast using the parcel-based PEM provides a good tool for 20-year growth projections at a county-wide scale and for utility service areas.

A Regional Water Balance Diagram has been developed covering five planning areas (Figure 6-1), which is a graphical representation of projected 2035 future conditions for water supply, wastewater treatment, reclaimed water and effluent disposal requirements. The following conclusions can be drawn from this evaluation:

Water Resources
Overall, the region has available water resources to meet the projected 2035 increase in demand. These water resources include the *Truckee River Operating Agreement* ("*TROA*") water supplies, the Fish Springs Water Importation Project, local basin groundwater supplies, and local tributary creeks. In addition to these water resources, the region has reclaimed water resources available for multiple uses from the Truckee Meadows Water Reclamation Facility ("TMWRF"), South Truckee Meadows Water Reclamation Facility ("STMWRF"), Reno Stead Water Reclamation Facility ("RSWRF") and Cold Springs Water Reclamation Facility ("CSWRF").

In the Truckee Meadows, a 2035 water supply surplus of more than 32,000 acre-feet ("af") is projected, while a projected 2035 water supply deficit exists in Lemmon Valley.

There will continue to be local area impacts within portions of these planning areas where mitigation of groundwater level declines and impacts to shallow domestic wells will continue to be necessary.

Wastewater
Long term disposal and reuse of treated effluent will be a challenge throughout the different planning areas. Both Cold Springs and Lemmon Valley have insufficient effluent reuse or disposal capacity to meet 2035 projections. Future effluent management options will need to be identified before 2035 to accommodate projected development.

In the Central Truckee Meadows, Sparks and Spanish Springs planning areas, effluent management options are adequate to meet projected 2035 needs, however discharge to the Truckee River through TMWRF may require implementation of advanced treatment technologies or other effluent management strategies to meet water quality constraints.

In the South Truckee Meadows planning area, 100 percent of the reclaimed water is used for irrigation. Based on the 2035 flow projections, approximately 4,400 af of additional water reclamation or disposal capacity will be required.

Water Conservation Plan - Efficient Use of Water

TROA has been implemented which provides for greater flexibility of surface water resources during drought. (See Section 2.2.3.4 for more on TROA). Water conservation ordinances will be retained by each of the jurisdictions in the Planning Area.

All public purveyors in the Planning Area are essentially fully metered.

There will be sufficient water for essential public health and safety needs, even during prolonged periods of drought or during an emergency event.

Increased use of reclaimed water and other non-potable water sources may be implemented subject to federal, state, local and Washoe County Health District (“WCHD”) regulations, and to the extent supplies are available from TMWRF, Reno-Stead Water Reclamation Facility (“RSWRF”) and South Truckee Meadows Water Reclamation Facility (“STMWRF”).

Enhanced conservation actions during droughts will be required when Floriston rates cannot be sustained during the irrigation season.

In order to increase water use efficiency of all customers, in 2015, TMWA successfully converted the remainder of its flat-rate-residential services to metered rates thereby allowing those customers detailed information on monthly water use.

Cost and Financing

This chapter briefly provides background that frames expectations for changes in costs and financing needs since the 2011 RWMP. It also gives a financial summary of funding needs for years 2015 through 2020, and long-term capital improvement needs for years 2021 through 2035. Potential funding alternatives are described, and the impact on existing and future users

of the water systems is discussed. Note that the data collection for this chapter occurred over a period of more than one year. Some information may have changed over this time period.

The data provided by each of the water service agencies shows that approximately the same level of spending on existing system facilities will continue in the next five years as was planned for in the previous five years. Spending on infrastructure to serve new development however is projected to almost double due to increased new development activity. Spending on wastewater systems is anticipated to comprise 50 percent, and water systems 39 percent, of total CIP spending over the five-year period from 2015 through 2020. The Truckee River Flood Project ("Flood Project") costs, which were included in the 2011 RMWP, have been excluded from the total costs in the 2016 RWMP; however, the Flood Project and its associated costs are described. The Project was removed due to the uncertainty of funding and timing of the Flood Project. It is estimated that about $90.1 million will be spent annually on capital improvement projects over the first five-year period, and at least $49.3 million will be spent annually through the following fifteen-year period. All costs are expressed in 2016 dollars. Costs over the fifteen-year period in this chapter are lower than actually expected for several reasons; first, the level of planning detail is low and costs are refined over time as the scope of improvements becomes better known; second, some cost data is not available at this time (although some idea of improvement needs are known, there has not been a scoping of budget conducted); and third, costs typically increase over time.

Impacts to the current users of the water systems cannot be estimated here because each agency employs different rate structure methodologies and has different philosophies in their approach to rate-setting. Impacts to future users of the systems similarly cannot be estimated; however, the impact of fees charged to new users is analyzed within context of the overall development fee and cost burden to evaluate the significance of water-related fees in development decisions. The analysis finds that water-related fees are relatively insignificant compared to the state of the general economy; however, the level of fees can encourage or discourage development in certain parts of the region.

4. Issues and Action Items

Current and future issues affecting the Planning Area identified in various chapters of this Plan are summarized in Chapter 9. Although numerous issues are identified and nearly 50 actions are proposed, only a subset are identified as needing near-term WRWC/NNWPC activity (see Table 9-2). These near-term action items, identified below, are intended to guide the focus and activities of the WRWC and NNWPC over the next five years.

Municipal Water Resources

♦ 9.1.C Participate in the DRI cloud seeding program for the Lake Tahoe basin and the Truckee River basin, and coordinate with DRI's efforts to continue the cloud seeding program statewide and support reinstatement of state funding.

♦ 9.1.D Adopt the TMWA 2035 WRP into the 2016 Regional Water Plan.

Water Conservation

♦ 9.2.A Revise Chapter 7 and "Base Case" conservation for consistency with the TMWA 2035 WRP, Chapter 5, which is tied to drought, Floriston Rates and TROA.

♦ 9.2.B Support and participate in the Water For The Seasons program, led by UNR, which investigates climate variability and potential water supply risks.

Wastewater Management

♦ 9.3.1.A Continue development of near-term regional strategies to manage effluent and reduce nitrogen loading to the Truckee River, which may include additional treatment, expanded distribution of effluent within or outside the TMSA, and expanded uses which may include aquifer recharge and indirect potable reuse.

♦ 9.3.1.B Pursue connection of additional reclaimed water users to the existing systems in Sparks and Reno, consistent with regional water quality and water rights considerations, and continue investigating the feasibility of expanded uses of reclaimed water

♦ 9.3.1.C and 9.3.2.C Continue evaluating the merits of regional integrated solutions between TMWRF and STMWRF for wastewater treatment and effluent reuse and disposal, including funding considerations.

♦ 9.3.3.A and 9.3.4.A Continue to evaluate the merits of regional integrated solutions between RSWRF and CSWRF for the treatment and disposal of wastewater, including funding considerations.

♦ 9.3.3.B Continue to work with NDEP on reclaimed water groundwater augmentation feasibility/demonstration efforts, including additional groundwater modeling assessments of aquifer storage and recovery.

♦ 9.3.6.A Continue to provide guidance to owners of septic systems and domestic wells on how to manage/mitigate domestic well water with elevated levels of nitrate.

Watershed-Based Water Quality Planning

♦ 9.4.A Continued SWPCC communication with NDEP as necessary to address changes/updates to the NPDES Storm Water Discharge Permit.

♦ 9.4.B Support the update of the Watershed Management Plan such that it can be used to support applications for 319h grants to help fund future watershed projects.

♦ 9.5.C Continue the analysis and development of non-structural measures to improve Truckee River water quality, enable increased TMWRF discharges to the Truckee River, and ensure the future sustainability of the river.

♦ 9.5.E Develop cooperative management strategies among local governments, reclaimed water providers and water purveyors that maximize the benefits of available reclaimed water resources to the Truckee Meadows community.

♦ 9.5.F Monitor existing and future water demand and planning area growth projections, and develop plans to resolve any major discrepancies in consideration of available water resources and geographic constraints.

Water Resources and Land Use Planning

♦ 9.6.A Continue working with TMRPA staff to strengthen appropriate linkages between the Regional Plan and the Regional Water Plan

♦ 9.6.B Review areas within the TMSA Boundary for gaps in facility planning and develop a plan to respond to changes in land use and the TMSA that affect current facility plans

♦ 9.6.C Coordinate with other entities on the development of a GIS parcel based tool that can be used to estimate potential water demands and wastewater flows based on approved land use

♦ 9.6.D Coordinate with local land use planning agencies to address rural groundwater basin imbalances

Acknowledgements

Western Regional Water Commission
Vaughn Hartung, Chairman (Washoe County)
Ron Smith , Vice-Chairman (TMWA-City of Sparks)
Sandra Ainsworth, Secretary Treasurer (Sun Valley General Improvement District)
Donald Abbott (City of Sparks)
Naomi Duerr (City of Reno)
Jeanne Herman (TMWA-Washoe County)
Neoma Jardon (TMWA-City of Reno)
Bob Lucey (TMWA-Successor to South Truckee Meadows General Improvement District)
Paul McKenzie (Truckee Meadows Water Reclamation Facility)

Northern Nevada Water Planning Commission

Voting Members
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Danielle Henderson, Vice Chairman (Truckee River Flood Management Authority)
Michael J. DeMartini (Domestic Wells Owner Representative)
Michael Drinkwater (Truckee Meadows Water Reclamation Facility)
John Enloe (TMWA)
Bill Hauck (Washoe County Water Conservation District)
Mickey Hazelwood (Public at Large)
John Martini (City of Sparks)
Darrin Price (Sun Valley General Improvement District)
David Solaro (Washoe County)
Mervin Wright (Pyramid Lake Paiute Tribe)
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Introduction

The Western Regional Water Commission ("WRWC") was created in 2007, effective April 1, 2008 by the Nevada Legislature and by Cooperative Agreement among the WRWC member agencies. Its purpose is to lead a cooperative approach to stewardship of the region's water resources through developing and implementing an integrated water resources plan, building understanding and trust among stakeholders, and establishing water resources public policy. The WRWC will serve a public use and promote the general welfare by facilitating unified and cooperative efforts to:

- Secure and develop additional water supplies
- Maintain and cooperatively establish policies for managing existing water resources and water supplies
- Provide for integrated regional water resources and management of water supplies
- Provide for integration of efforts to manage storm water
- Provide for protection of watersheds
- Provide for regional conservation efforts, subject to and in accordance with the *Truckee River Operating Agreement* ("*TROA*")

Purpose

Chapter 531, Statutes of Nevada 2007, the Western Regional Water Commission Act (the "Act"), in addition to creating the WRWC, created the Northern Nevada Water Planning Commission ("NNWPC"). The Act requires the NNWPC to develop a comprehensive plan for the planning area covering municipal and industrial water supply, water quality, sanitary sewerage; sewage treatment, storm water drainage and flood control. The overall purpose is to deal with current and future problems affecting the planning area as a whole with respect to the subjects of the plan. The Act further requires the NNWPC to develop the initial comprehensive plan on or before January 1, 2011, hereinafter "*2011 Regional Water Plan*" or "*Regional Water Plan*". After adoption of the initial *Regional Water Plan*, the Act requires the NNWPC to review the *Plan* at least every five years and prepare proposed amendments for submittal to the WRWC, or report that there are no amendments. This *2016-2015 Regional Water Plan* amends and updates the initial *Plan*. The Act as amended appears in Appendix A.

Planning Area

The Planning Area consists of Washoe County in its entirety except land within the Tahoe basin, any Indian reservation or Indian colony, the Gerlach General Improvement District ("GID"), and State groundwater basins 22-San Emidio Desert, 23-Granite Basin, and 24-Hualapai Flat. Planning is focused, however, on the Truckee Meadows Service Area ("TMSA"), consistent with the Truckee Meadows Regional Plan ("Regional Plan"). The Planning Area is shown on Figure I-1.

Background

For decades, entities involved with water issues in the Truckee Meadows have recognized a need to develop a plan for water supply, water quality, wastewater management, storm water drainage and flood control using a regional approach. Recent regional water planning efforts

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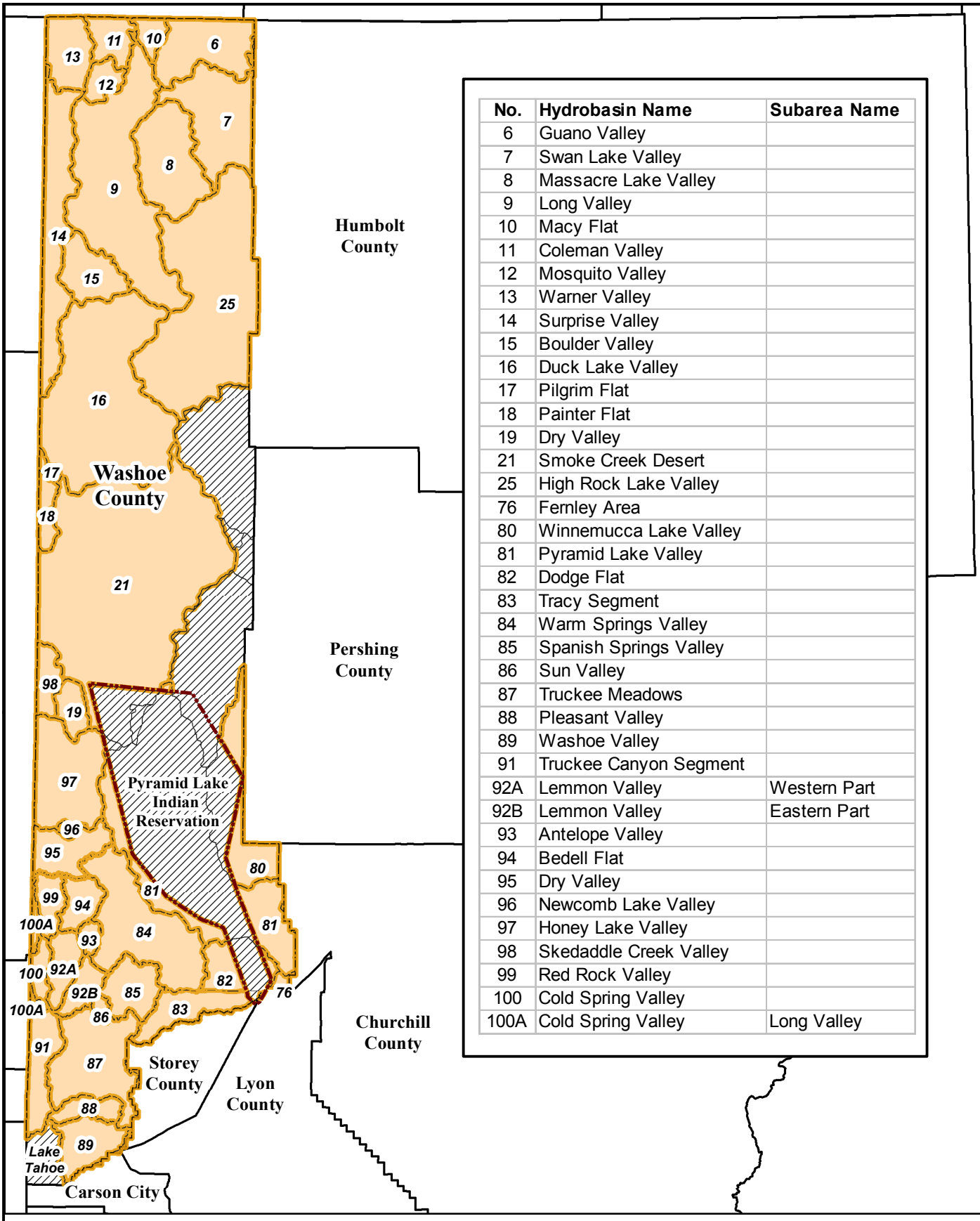

No.	Hydrobasin Name	Subarea Name
6	Guano Valley	
7	Swan Lake Valley	
8	Massacre Lake Valley	
9	Long Valley	
10	Macy Flat	
11	Coleman Valley	
12	Mosquito Valley	
13	Warner Valley	
14	Surprise Valley	
15	Boulder Valley	
16	Duck Lake Valley	
17	Pilgrim Flat	
18	Painter Flat	
19	Dry Valley	
21	Smoke Creek Desert	
25	High Rock Lake Valley	
76	Fernley Area	
80	Winnemucca Lake Valley	
81	Pyramid Lake Valley	
82	Dodge Flat	
83	Tracy Segment	
84	Warm Springs Valley	
85	Spanish Springs Valley	
86	Sun Valley	
87	Truckee Meadows	
88	Pleasant Valley	
89	Washoe Valley	
91	Truckee Canyon Segment	
92A	Lemmon Valley	Western Part
92B	Lemmon Valley	Eastern Part
93	Antelope Valley	
94	Bedell Flat	
95	Dry Valley	
96	Newcomb Lake Valley	
97	Honey Lake Valley	
98	Skedaddle Creek Valley	
99	Red Rock Valley	
100	Cold Spring Valley	
100A	Cold Spring Valley	Long Valley

Figure I-1 Hydrographic Basins within the Western Regional Water Commission Planning Area

Planning Area

Hydrobasins or Areas outside of Planning Area

0 2.5 5 10 15 20 25 Miles

Department of Water Resources

Notes: The Scale and configuration of all Information shown heron are approximate only and are not intended as a guide for design or survey work. Reproduction is not permitted without prior written permission from the Washoe County Department of Water Resources.

October 2010

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started in 1983 when the Nevada Legislature established the Regional Water Planning and Advisory Board ("RWPAB") of Washoe County. The enabling legislation's general mandate to the RWPAB was to develop a regional plan for present and future uses of water resources in the region, recognizing local governments' land use plans and coordinating the needs of incorporated areas with unincorporated areas. The RWPAB was also directed to identify "potential supplies of water" for the region. The Regional Water Resources Plan ("RWRP") was accepted by the RWPAB in March 1990 as a starting point for further planning efforts.

The 1988 Legislation, Nevada Revised Statutes ("NRS") 278.026–029, amended in 1991, mandated the development of a comprehensive land use plan for the region. The Truckee Meadows Regional Planning Governing Board ("RPGB"), established by this legislation, used an impartial fact finder to establish a coordinated approach to deal with providing wastewater and water services for the region. The fact finder, Kato & Warren Inc., completed its report (Kato & Warren, 1990) in 1990 and recommended that a unified and coordinated approach, directed by one agency, be used to develop a plan to address wastewater treatment; water supply, flood control and storm water drainage; and Truckee River water quality.

From this recommendation, Washoe County funded the Regional Water Supply and Quality Study ("RWSQS"), which was completed in 1993. This extensive report was accepted by the Washoe County Board of Commissioners ("BCC") but not formally adopted.

In 1995, Washoe County, the City of Reno ("Reno") and the City of Sparks ("Sparks") developed legislation to again address regional water issues. This legislation, NRS 540A.010–240, provided the basis and direction for the Regional Water Planning Commission ("RWPC") and the Washoe County Comprehensive Regional Water Management Plan.

The RWPC developed, approved and recommended the *1995–2015 Washoe County Comprehensive Regional Water Management Plan* to the Board of County Commissioners ("BCC") on November 20, 1996. The BCC adopted the Plan in January 1997 and it was found in conformance with the Regional Plan the following month. Later that month, the *Plan* was approved by the Reno City Council, the Sparks City Council and was accepted by the Nevada Legislature in June 1997. NRS 540A required that the RWPC review the initial Plan within five years of its adoption, and every three years thereafter. The *2004–2025 Washoe County Comprehensive Regional Water Management Plan* was prepared as a result of the RWPC's five-year review, adopted in January 2005 and amended in 2006 and 2009.

In June 2007, the Legislature approved Senate Bill 487, a special Act, authorizing the creation of the WRWC and the NNWPC. The Act repealed the sections of NRS 540A dealing with the RWPC, but provided that "the provisions of the comprehensive plan developed and revised pursuant to the former provisions of NRS 540A.130 before April 1, 2008, remain in effect" until the WRWC adopts the initial comprehensive plan required by the Act, i.e., the *Regional Water Plan*.

Plan Development, Adoption and Review Responsibilities

The NNWPC is responsible for developing the *Regional Water Plan* and recommending future revisions. The NNWPC is also responsible for reviewing the Plan at least every five years and submitting any amendments to the WRWC. Adoption of the *Plan* (or amendments thereto) is the responsibility of the WRWC. The Regional Planning Commission ("RPC") is responsible for reviewing the *Plan* or amendments for consistency with the Regional Plan, master plans and any other land use plans adopted by local governments within the Planning Area.

In developing the *Regional Water Plan*, the NNWPC must, according to Section 44 of the Act:

1. Receive and consider information from public purveyors, public utilities and other entities supplying municipal and industrial water within the Planning Area;
2. Receive and consider information from entities providing sanitary sewerage, sewage treatment, storm water drainage and flood control within the Planning Area;
3. Receive and consider information from entities concerned with water quality within the Planning Area;
4. Review and consider any plan or recommendation of the State Engineer concerning the development, conservation and use of water resources, existing water conservation plans, the Regional Plan and any master plan that has been adopted pursuant to the provisions of NRS 278 and any similar plan of a local government which applies to any area in the Planning Area, and may seek and consider the advice of each local planning commission and any other affected entity;
5. Coordinate and make consistent the elements of the *Plan* set forth in the Act;
6. Consider existing applicable laws;
7. Recognize and coordinate the needs of the incorporated areas of the Planning Area with the needs of the unincorporated areas of the Planning Area; and
8. Receive and consider information from other interested persons.

The *Regional Water Plan* must also, according to Section 43 of the Act:

1. Be consistent with and carry out the provisions of the Regional Plan adopted by the RPGB pursuant to NRS 278.0276 and the master plans and any other plans for the use of land which are adopted by governmental entities within the Planning Area;
2. Be consistent with and carry out or support the carrying out of all aspects of *TROA* and Water Quality Settlement Agreement ("WQSA"); and
3. Be consistent with the state water plan that is in effect at the time that the Plan is adopted.

Sections 41 and 42 of the Act set forth in detail the required contents of the *Plan* (see Appendix A).

Plan Use, Implementation and Relation to Plans of Implementing Entities

The *Regional Water Plan* compiles and integrates multiple sources of information in an effort to be inclusive, provide comprehensive, consistent policy-level guidance to regional and local entities and comply with the Act. The *Plan* is not an enforcement-oriented plan and relies on the cooperation and collaboration of the WRWC member agencies, NNWPC members and local and regional government planning agencies for implementation.

Among the most valuable requirements of the *Plan* is the development of goals and policies to deal with current and future problems affecting the Planning Area (WRWC Act, Section 41.2). These policies, comprising Chapter 1, provide a set of consistent guiding principles for Public Purveyors, other service providers and local and regional government planning agencies to consider when developing their plans and reviewing the plans of others.

The NNWPC developed the *Regional Water Plan* in accordance with the Act and in doing so, received, considered and incorporated to the extent feasible and consistent with the objectives

of the WRWC, facility plans, water resource plans and Capital Improvement Plans ("CIP") developed by Public Purveyors and other entities providing services covered by the Plan. The provisions of Public Purveyors' and other service providers' facility plans and water resource plans, and the policies, rules and actions of their respective governing boards, in part make up the basis for the Chapter 1 Regional Water Planning Policies and Criteria. In addition, state laws, local codes, plans, and other documents, some required by the Act and referenced above, were considered, including but not limited to:

- Federal Acts, such as the Clean Water Act and Safe Drinking Water Act and Truckee River Negotiated Settlement
- *Truckee River Operating Agreement* and *Water Quality Settlement Agreement*
- Decisions, orders and recommendations of the State Engineer, including existing conservation plans
- *State Water Plan*
- *Washoe County 208 Water Quality Management Plan*
- *TMWA 2016-2035 Water Resource Plan* (see Appendix B)
- Public Purveyor and other service provider facility plans and CIPs
- *Regional Plan*
- Local Government Master Plans
- Washoe County Consensus Population Forecast ("Consensus Forecast")

As Public Purveyors' and other service providers' plans and CIPs are considered and to the extent feasible incorporated into the *Regional Water Plan*, those entities are responsible for its implementation consistent with the Water Planning Policies and Criteria, and other provisions of the Plan.

Because the NNWPC considered the *Regional Plan* and local government master plans during the development of the *Regional Water Plan*, and because of the required review for consistency with the *Regional Plan* and master plans after the *Regional Water Plan* is adopted, consistency is assured among the *Plan* and land use plans in the Planning Area. For example, Section 2.2.1.1 describes a biennial process by which the NNWPC reviews the Consensus Forecast with respect to the sustainable water resources identified in the *Plan* and makes a recommendation to the WRWC concerning a determination and finding to be transmitted to the RPC before the Consensus Forecast is adopted. Once adopted, the *Regional Plan* and local government master plans use the Consensus Forecast as a primary planning factor. In addition, as the Regional Planning Agency conducts reviews for conformance with the *Regional Plan*, certain Regional Water Planning Policies and Criteria are considered. Likewise conformance reviews of facility plans conducted by the NNWPC consider applicable Regional Plan policies. NNWPC conformance reviews are conducted according to Policy 4.1.a (see Chapter 1).

Abbreviations

(A glossary of water-related terms is provided as Appendix C.)

ACOE	US Army Corps of Engineers
af	acre foot, acre feet
afa	acre-feet per year
ASR	artificial storage and recovery
AWWA	American Water Works Association
BCC	Washoe County Board of Commissioners
BMP	Best Management Practice
BNR	biological nutrient removal
BOR	Bureau of Reclamation
CAB	Citizens Advisory Board
cfs	cubic foot per second
CTMRD	Central Truckee Meadows Remediation District
DRI	Desert Research Institute
EIR	environmental impact report
EIS	environmental impact statement
EPA	US Environmental Protection Agency
FEMA	Federal Emergency Management Agency
GID	General Improvement District
GIS	geographic information system
gpd	gallons per day
gpm	gallons per minute
GWR	Groundwater Rule
HSPF	Hydrologic Simulation Program-Fortran
IVGID	Incline Village General Improvement District
LID	low impact development
M&I	municipal and industrial
MCL	maximum contaminant level
mg/L	milligrams per liter
MGD	million gallons per day
NDEP	Nevada Division of Environmental Protection
NEMO	Non-point Education for Municipal Officials
NEPA	National Environmental Policy Act
NNWPC	Northern Nevada Water Planning Commission
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service (US Dept. of Agriculture)
NRS	Nevada Revised Statute
O/M	operations and maintenance
PCE	perchloroethylene or tetrachloroethylene
PL	public law
PLPT	Pyramid Lake Paiute Tribe
POSW	privately owned stored water
ppd	pounds per day
ppm	parts per million
PUC	Public Utilities Commission (Nevada)
RMP	Remediation Management Plan
RPC	Regional Planning Commission

RSWQMP	Regional Storm Water Quality Management Plan
RSWRF	Reno-Stead Water Reclamation Facility
RWPC	Regional Water Planning Commission
RWRP	Regional Water Resource Plan
RWSQS	Regional Water Supply and Quality Study
SNOTEL	Natural Resource Conservation Service's Automated Snowpack Telemetry System
SOI	sphere of influence
STMGID	South Truckee Meadows General Improvement District
STMWRF	South Truckee Meadows Water Reclamation Facility
SVGID	Sun Valley General Improvement District
SWAP	Source Water Assessment Program
TCID	Truckee Carson Irrigation District
TDS	total dissolved solids
TMDL	total maximum daily load
TMRPA	Truckee Meadows Regional Planning Agency
TMSA	Truckee Meadows Service Area
TMWA	Truckee Meadows Water Authority
TMWRF	Truckee Meadows Water Reclamation Facility
TROA	Truckee River Operating Agreement
T-TSA	Tahoe-Truckee Sanitation Agency
UNCE	University of Nevada, Reno Cooperative Extension
UNR	University of Nevada, Reno
USGS	US Geological Survey
WARMF	Watershed Analysis Risk Management Framework
WCDHD	Washoe County District Health Department
WCDWR	Washoe County Department of Water Resources
WHPP	wellhead protection plan
WRWC	Western Regional Water Commission
WSCD	Washoe-Storey Conservation District
WTP	water treatment plant
WWTP	wastewater treatment plant

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