2004 – 2025 Washoe County Comprehensive Regional Water Management Plan

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Introduction

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Purpose

The purpose of the Comprehensive Regional Water Management Plan (Regional Water Plan) is to provide the region with an outline of how water will be managed to meet the needs of the citizens into the future. Major components of the plan are identification of future water supply and wastewater facilities, regional flood control and drainage projects, and development of a water conservation program.

Background

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

Attempts at regional water planning started in 1983 when the Nevada State 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.

In 1988, the Legislature passed Nevada Revised Statute (NRS) 278.026–029 inclusive (amended in 1991), mandating the development of a comprehensive land use plan for the region. The Truckee Meadows Regional Planning Governing Board (established by this legislation) could not agree as to the best method of providing wastewater and water services for the region but did agree to abide by the findings of an impartial fact finder to establish a coordinated approach to deal with these issues. The fact finder, Kato & Warren Inc., completed its report in 1990. The report 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 drainage, and Truckee River water quality. The fact finder further recommended that Washoe County serve as the overall agency to develop this plan. Specifically, the report recommended that:

The County should begin at once to organize and conduct a coordinated study of water supply, waste treatment, and water quality aspects of flood control and drainage such that water quality standards in the Truckee River can be achieved to the satisfaction of the Pyramid Lake Paiute Tribe and the state and federal agencies.

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 (Board) but not adopted.

In 1995, Washoe County and the Cities of Reno and Sparks developed legislation to again address regional water issues. This legislation, NRS 540A, was approved by the Nevada State Legislature in July 1995. NRS 540A.010 through 540A.240 were amended by the 1997 Legislature to remove a July 1997 sunset date (see Appendix A). These statutes provide the

basis and direction for the Regional Water Planning Commission (RWPC) and the Regional Water Plan.

The RWPC approved and recommended the 1995–2015 Regional Water Plan to the Board on November 20, 1996. The Board adopted the Plan on January 14, 1997. The Regional Water Plan was found in conformance with the Regional Plan on February 12, 1997, approved by the Reno City Council on February 18, 1997, approved by the Sparks City Council on February 24, 1997 and accepted by the Nevada Legislature in June 1997. Approval of the initial Regional Water Plan by the two Cities was required by the 1995 Legislature (Chapter 688, Statutes of Nevada 1995). Concurrent with the 1995 legislation, the three local governments hired Carollo Engineers to develop a Reno/Sparks/Washoe County Regional Wastewater Reclamation Facilities Master Plan, which was finalized on December 31, 1998. The Regional Wastewater Reclamation Facilities Master Plan was used as the wastewater element of the 1995–2015 Regional Water Plan excluding the outlying areas.

Since its adoption in 1997, the Regional Water Plan has been amended twice. On January 28, 1997, 14 days after its initial adoption by the Board, the Plan was amended to focus on a regional goal to reduce water consumption as provided in the “Base Case” conservation plan through landscaping performance standards, and to add or delete other specific projects. On July 14, 1998, the Board amended the plan to include the "North Valleys Water Alternatives," also known informally as the “North Valleys Strategy,” with the provisions that no more money be expended on studying the Warm Springs project or the Truckee Meadows project.

NRS 540A requires that the RWPC review the initial Regional Water Plan within five years of its adoption, and every three years thereafter. After each review the Commission is to submit an amendment to the Board or report that there are none. This 2004–2025 Regional Water Plan is prepared as a result of the Commission’s five-year review completed in February 2002. Amendments to the plan, once approved by the RWPC, must follow an approval process similar to that of the original plan. Approvals for amendments in the order in which they must occur are listed below:

- RWPC by a two-thirds majority vote
- Board of County Commissioners by a two-thirds majority vote
- Regional Planning Commission (conformance review)

Responsibility

The RWPC is responsible for periodic review of the Regional Water Plan and submittal of proposed amendments to the Board (NRS 540A.170, 220). Adoption of the plan or amendments to the plan is the responsibility of the Board (NRS 540A. 040, 180-190). The Regional Planning Commission is responsible for reviewing the plan or amendments to the plan for conformance with the Truckee Meadows Regional Plan, comprehensive plans and master plans adopted by local governments (NRS 540A.200). The Regional Planning Governing Board is responsible for resolving any appeals of the Regional Planning Commission’s determination of conformance or nonconformance (NRS 540A.210).

Implementation

Implementation of the Regional Water Plan will be based on several factors: demand for water/wastewater facilities based upon growth, a recognized public safety need, or identified capital improvements with a recognized and approved funding source.

Format

In accordance with NRS, Chapter 540A, the plan must cover the supply of municipal and industrial (M&I) water, quality of water, sanitary sewerage, treatment of sewage, drainage of storm waters, and control of floods.

The plan must consist of written text, appropriate maps, and goals and policies to deal with current and future problems affecting the region as a whole with respect to the subjects of the plan.

The plan must:

- Describe the problems and needs of the region relating to the subjects of the plan
- Identify the providers of services relative to those subjects within the region and the area within which each provides service, including service areas for public utilities
- Identify alternatives to reduce demand or increase supply
- Identify existing and future sources of water needed to meet the present and future needs of the region
- Define priorities and general location for additional major facilities needed to provide services relating to the subjects of the plan
- Describe programs to mitigate drought, achieve conservation of water, protect wellheads, and otherwise manage water

The plan must include the following elements:

1. Quality of surface water, which must include:
    - Compliance with standards of quality for bodies of water
    - Locations and capacities of plants to treat wastewater
    - Intended quantity and quality of discharge from those plants and its reuse, service areas, and interceptors
    - Programs to attain protection from pollution by both concentrated and diffuse sources

2. Quality of groundwater, which must include:
    - Compliance with standards of quality for hydrographic basins and septic tanks
    - Capacities for withdrawal of water from hydrographic basins
    - Programs to protect wellheads
    - Programs to clean up contaminated groundwater for hydrographic basins
    - Programs to attain protection from pollution by both concentrated and diffuse sources

3. Supply of surface water, which must include:
    - Existing and planned sources of surface water

- Existing and planned uses for all surface water, including M&I uses, requirements for return flow, reserves for drought and future growth, uses to improve quality of water, uses to provide habitat, and uses in conjunction with groundwater
- Major facilities to convey and store surface water
- Standards, service areas, rates of flow, and reserves for storage
- Facilities to treat surface water

4. Supply of groundwater, which must include:

   - Existing and planned sources of groundwater
   - Existing and planned uses for all groundwater, including M&I uses, maintenance of minimum groundwater level and need for recharge, reserves for drought and future growth, uses to improve quality of water, uses to provide habitat, and uses in conjunction with surface water
   - Major facilities to extract and convey groundwater
   - Compliance with standards for treated and non-treated water, service areas, rates of flow, and reserves for storage
   - Facilities to treat and store groundwater

5. Control of floods and drainage of storm water, as it relates to surface water, which must include:

   - Minimum standards of design for controlling floods in the region
   - Non-structural alternatives and standards for facilities to control floods in the region and single drainage basins
   - Regional facilities to control floods
   - Generalized facilities and standards of design for single drainage basins

6. Control of floods and drainage of storm water, as it relates to groundwater, which must include:

   - Groundwater level and capacity for additional storage of water underground as a means of mitigating floods
   - Locations and capacities of major facilities for controlling floods which utilize storage of water underground to mitigate floods
   - Standards of design for devices to infiltrate storm water and other minor facilities for controlling floods which utilize storage of water underground to mitigate floods

7. Cost and financing, which must include an estimate of the cost of each major facility, source of water or other requirement of the plan, an analysis of alternatives for financing and funding the facility, source or other requirements or alternatives thereto, and the effects of the funding alternatives on other facilities included in the plan. The estimate of cost must state the financial impact on persons within the region, including without limitation, all direct and indirect costs of connecting to the system, if any.

Application

The Regional Water Plan is specific to the area depicted on Figure I-1 and is generally described as all lands within Washoe County south of Township 25, excluding the Lake Tahoe

watershed, Pyramid Lake Paiute Reservation, and other tribal trust lands within the planning area.

Directions for Future Revisions of Plan

The initial planning effort focused on short-term (5 year) needs of the region concerning water supply, water quality, flood control and storm water drainage. NRS 540A requires that the Regional Water Plan be reviewed initially within 5 years of its adoption, and every 3 years thereafter. As with all plans, a long-term, comprehensive plan is needed for the region, and the current effort will be updated every few years as conditions and information change. This first update compiles the various projects, studies and facilities planning efforts recommended by the RWPC as a result of the planning needs expressed in the initial plan. Future planning needs are identified in Chapter 11. RWPC members and staff believe the process established by NRS 540A will, with continued support by the entities involved, continue to serve the region well in addressing regional water issues.

Abbreviations

af	acre-foot
af/yr	acre-feet per year
ADMMF	average day maximum month flows
AF/DU	acre-feet per dwelling unit
ASR	artificial storage and recovery
AWWA	American Water Works Association
BMP	Best Management Practices
BNR	biological nutrient removal
Board	Washoe County Board of Commissioners
BOR	Bureau of Reclamation
CAB	Citizens Advisory Board
cfs	cubic foot per second
Corps	US Army Corps of Engineers
CTMRD	Central Truckee Meadows Remediation District
DRI	Desert Research Institute
DSS	decision support system
DSSAMt	Dynamic Stream Simulation and Analysis Model with Temperature
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
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
GWR	Groundwater Rule
HSPF	Hydrologic Simulation Program-Fortran
IDDE	illicit discharge detection and elimination
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
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service (US Dept. of Agriculture)
NRS	Nevada Revised Statute
O&M	operations and maintenance
OCA	Consumer Advocate Office of the Attorney General
PCE	perchloroethylene or tetrachloro ethylene
pCi/L	pico-curies per liter
PL	public law

ppd	pounds per day
ppm	parts per million
POSW	privately owned stored water
PUC	Public Utilities Commission (Nevada)
RMP	Remediation Management Plan
RPC	Regional Planning Commission
RSWQMP	Regional Storm Water Quality Management Plan
RWPC	Regional Water Planning Commission
RWRP	Regional Water Resource Plan
RWSQS	Regional Water Supply and Quality Study
RSWRF	Reno-Stead Water Reclamation Facility
SHR	significant hydrological resource
SNOTEL	Natural Resource Conservation Service's Automated Snowpack Telemetry System
SOI	sphere of influence
SPPCo	Sierra Pacific Power Company
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
TMWA	Truckee Meadows Water Authority
TMRPA	Truckee Meadows Regional Planning Agency
TMWRF	Truckee Meadows Water Reclamation Facility
TMSA	Truckee Meadows Service Area
Tribe	Pyramid Lake Paiute Tribe
TRIT	Truckee River Basin Recovery Implementation Team
TROA	Truckee River Operating Agreement
T-TSA	The Tahoe-Truckee Sanitation Agency
UNR	University of Nevada, Reno
UNRCE	University of Nevada, Reno Cooperative Extension
USGS	US Geological Survey
WARMF	Watershed Analysis Risk Management Framework
WCDWR	Washoe County Department of Water Resources
WCDHD	Washoe County District Health Department
WSCD	Washoe-Storey Conservation District
WHPP	wellhead protection plan
WWTP	wastewater treatment plant
WTP	water treatment plant
WWF	wet weather flow

Glossary

Definitions for water-related terms were taken from *Water Words Dictionary*, published by the Nevada Department of Conservation and Natural Resources, Division of Water Planning. Other sources include the Washoe County Comprehensive Plan and Webster's Dictionary.

100-year flood plain: The area of a flood plain subject to a 1 percent chance of flooding in any given year.

208 Studies: Refers to Section 208 of Public Law 92-500 as amended (Clean Water Act), which requires population projections, water quality needs, and waste treatment needs be projected and a plan developed to show how water quality standards will be met.

303(d) list: Clean Water Act-required list of water quality impaired surface waters.

acre-foot (af): A unit commonly used for measuring the volume of water; equal to the quantity of water required to cover 1 acre (43,560 square feet) to a depth of 1 foot and equal to 43,560 cubic feet or 325,851 gallons.

activated sludge: the floc produced in raw or settled wastewater due to the growth of bacteria and other organisms in the presence of dissolved oxygen.

ALERT: A flood alert system known as "Truckee Meadows Early Warning Flood ALERT System".

allotment management plan: A livestock management plan specific to federal range allotments depicting season of use, seasonal location of livestock, and permitted numbers of livestock.

alluvial: Describes soil or earth material which has been deposited by running water, as in a riverbed, flood plain, or delta.

alluvial fan: A fan-shaped deposit of generally coarse material created where a stream flows out onto a gentle plain.

application, water right: An official request for permission to initiate a water right or to change an existing water right. The application will typically consist of the following information: (1) total amount of water to be diverted or pumped; (2) rate of flow (diversion); (3) point of diversion or pumpage; (4) point or place of use; (5) manner of (beneficial) use; (6) period of use (continuous pumpage, seasonal diversion, etc.). The application process is the first step in a process of obtaining a certificate of use or a *perfected water right*. This process includes (1) the filing of the application, which establishes the priority date for appropriation purposes; (2) the permit which is issued by the State Engineer or other approving authority; (3) the proof of completion which is filed by the applicant; (4) the proof of beneficial use which is also filed by the applicant; and (5) the certificate or perfected water right which is issued by the State Engineer or other approving authority.

appropriate (water rights): To authorize the use of a quantity of water.

(prior) appropriation doctrine: The system for allocating water to private individuals used in most western states. The doctrine of *prior appropriation* was in common use throughout the arid west as early settlers and miners began to develop the land. The prior appropriation doctrine is based on the concept of "first in time, first in right". The first person to take a quantity of water and put it to *beneficial use* has a higher priority of right than a subsequent user. Under drought conditions, higher priority users are satisfied before junior users receive water.

Appropriative rights can be lost through nonuse; they can also be sold or transferred apart from the land.

aquatic: (1) consisting of, relating to, or being in water; living or growing in, on, or near the water. (2) taking place in or on the water.

aquifer: A geologic formation, a group of formations, or a part of a formation that is water bearing. A geological formation or structure that stores or transmits water, or both. Use of the term is usually restricted to those water-bearing units capable of yielding water in sufficient quantity to constitute a usable supply.

aquifer recharge: Flow to groundwater storage from precipitation, infiltration from streams.

area plan: Plans adopted by Washoe County which cover specific sub-areas of the unincorporated County. These plans provide basic information on the natural features, resources, and physical constraints that affect the development of the planning area. They also specify detailed land use designations which are then used to review specific development proposals and to plan services and facilities.

artificial recharge: The designed (as opposed to the natural or incidental) replenishment of groundwater storage from surface water supplies. There are five common techniques to effect artificial recharge of a groundwater basin: (1) *water spreading,* consisting of the basin method, stream-channel method, ditch method, and flooding method, all of which tend to divert surface water supplies to effect underground infiltration; (2) *recharge pits* designed to take advantage of permeable soil or rock formations; (3) *recharge wells,* which work directly opposite of pumping wells although they have a limited scope and are better used for deep, confined aquifers; (4) *induced recharge,* which results from pumping wells near surface supplies, thereby inducing higher discharge toward the well; and (5) *wastewater disposal,* which includes the use of secondary treatment wastewater in combination with spreading techniques, recharge pits, and recharge wells to reintroduce the water to deep aquifers, thereby both increasing the available groundwater supply and further improving the quality of the wastewater. Also referred to as *induced recharge*. Also see *natural recharge, induced recharge, incidental recharge*, and *perennial yield*.

base flow: 1) The flow that a perennially flowing stream reduces to during the dry season; 2) The fair-weather or sustained flow of streams; 3) The volume of flow in a stream that is not derived from surface run-off.

beneficial use (of water): The cardinal principle of the (prior) *appropriation doctrine*. A use of water that is, in general, productive of public benefit and which promotes the peace, health, safety, and welfare of the people of the State. A *certificated water right* is obtained by putting water to a beneficial use. The right may be lost if beneficial use is discontinued. A beneficial use of water is a use which is of benefit to the appropriator and to society as well. The term encompasses considerations of social and economic value and efficiency of use. In the past, most reasonably efficient uses of water for economic purposes have been considered beneficial. Usually, challenges have been raised only to wasteful use or use for some non-economic purpose, such as preserving in-stream values. Beneficial use can include the use of water for recreation, fish and wildlife purposes, or preservation of the environment. Also see *appropriate (water rights)*.

best management practices (BMPs): Accepted methods for preventing or controlling *non-point source pollution*; may include one or more conservation practices.

biomass: (1) The total mass of living matter within a given unit of environmental area; (2) plant material, vegetation, or agricultural waste used as a fuel or energy source.

bioremediation: Simply, the use of biological techniques to clean up pollution. More specifically, the use of specialized, naturally occurring microorganisms with unique biological characteristics, appetites, and metabolisms as a form of waste cleanup. A critical underpinning of this process is the ability to economically generate a sufficient biomass of the appropriate microbes to accomplish in weeks or months what would normally take nature years to do. Typically, this is done either by applying a sufficient concentration of such microbes directly to the polluted area or by applying various concentrations of chemicals which, in turn, stimulate and foster the rapid growth of appropriate microorganisms.

blending: Mixing of product water from a desalting plant with conventional water to obtain a derived dissolved solids content, or mixing brine effluents with sewage treatment plant effluents to reduce evaporation pond size. (In this document blending describes mixing surface water with groundwater that exceeds a drinking water standard (e.g. arsenic) to achieve the standard.)

caliche: A soil layer near the surface, more or less cemented by secondary carbonates of calcium or magnesium precipitated from the soil solution. It may occur as a soft, thin soil horizon, as a hard, thick bed just beneath the solum, or as a surface layer exposed by erosion.

Capital Improvements Program (CIP): A plan for capital expenditures to be incurred each year over a fixed period of several years setting forth each capital project, identifying the expected beginning and ending date for each project, the amount to be expended in each year, and the method of financing those expenditures.

certificated water right: The right granted by a State water agency to use either surface or groundwater. Certificated water rights have been put to a *beneficial use*. Also see *application*, *water right* and *vested water right*.

channel capacity: The maximum rate of flow that may occur in a stream without causing over-bank flooding.

coliform: Bacteria associated with human and animal waste. Used as an indicator of the possible presence of disease-causing microorganisms. All drinking water sources are routinely monitored for coliform “counts”.

commitment: An allocation of a water resource that is granted through a “will serve” letter from a municipal water purveyor to a project(s).

comprehensive plan: (natural resource) A plan for water and related land resources development that considers all economic and social factors and provides the greatest overall benefits to the region as a whole.

conjunctive use: The combined use of surface and groundwater systems to optimize resource use.

consumptive use: The portion of water withdrawn from a surface or groundwater source that is consumed for a particular use (e.g. irrigation, domestic needs, and industry) and does not return to its original source or another body of water. The terms *consumptive use* and *non-consumptive use* are traditionally associated with water rights and water use studies, but they are not completely definitive. No typical consumptive use is 100 percent efficient; there is always some return flow associated with such use either in the form of a return to surface flows or as a groundwater recharge. Nor are typically non-consumptive uses of water entirely non-consumptive. There are evaporation losses, for instance, associated with maintaining a

reservoir at a specified elevation to support fish, recreation, or hydropower, and there are conveyance losses associated with maintaining a minimum stream-flow in a river, diversion canal, or irrigation ditch.

contact stabilization: A modification of the activated sludge process wherein a contact basin provides for the rapid adsorption (adhesion to the surface of solids) of the waste. A separate tank is provided for stabilization of the solids before they are reintroduced into the raw wastewater flow.

contaminants: (water quality) In a broad sense, any physical, chemical, biological, or radiological substance or matter in water. In more restricted usage, a substance in water of public health or welfare concern. Also, an undesirable substance not normally present or an unusually high concentration of a naturally occurring substance in water, soil, or other environmental medium.

contamination (water): Impairment of the quality of water sources by sewage, industrial waste, or other matters to a degree that creates a hazard to public health. Also, the degradation of the natural quality of water as a result of man's activities. There is no implication of any specific limits, since the degree of permissible contamination depends upon the intended end use, or uses, of the water.

cryptosporidium: Protozoan associated with domestic animal waste in surface water supplies, principally sheep and cattle, that causes serious health problems. The EPA has mandated water treatment processes to help protect surface water supplies from cryptosporidium.

cubic foot per second (cfs): A unit expressing rate of discharge, typically used in measuring stream flow. One cubic foot per second is equal to the discharge of a stream having a cross section of 1 square foot and flowing at an average velocity of 1 foot per second. It also equals a rate of 448.83 gallons per minute.

cultural resource: The tangible and intangible aspects of cultural systems, living and dead, that are valued by a given culture or contain information about the culture. Cultural resources include, but are not limited to, sites, structures, buildings, districts, and objects including plants and animals associated with or representative of people, cultures, and human activities and events.

cumulative impact: An effect which is a result of several related projects. Each increment from each project may not be noticeable but cumulative impacts may be noticeable when all increments are considered together.

customer: a person served by a utility

debris flow: A moving mass of rock fragments, soil, and mud with more than half of the material being larger than sand size.

denitrifying treatment system: a system that receives sewage or nitrate-laden water and, through biological denitrification, chemical reduction or ion exchange, and with proper maintenance, reduces the nitrate level of the effluent to less than 10 mg/l total nitrogen.

designated groundwater basin (administered basins)—Nevada: In the interest of public welfare, the Nevada State Engineer, Division of Water Resources, Department of Conservation and Natural Resources, is authorized by statute (NRS 534.120) and directed to designate a groundwater basin and declare Preferred Uses within such designated basin. The State Engineer has additional authority in the administration of the water resources within a designated water basin.

development code: Document that incorporates all county or city development-related ordinances and standards to ensure conformity with the Washoe County Comprehensive Plan.

discharge permits: Permits obtained through the Nevada Division of Environmental Protection to discharge water into area rivers, streams, and groundwater.

discount factor: In the case of some water resources such as groundwater and tributary creeks, there are more water rights available than can be supported by the sustainable yield of the resource. In an effort to manage the available resources such that commitments do not exceed the sustainable yield, a water rights dedication policy may be developed that requires a greater than 1:1 dedication of water rights to commitment ratio.

dissolved oxygen: The oxygen dissolved in water, wastewater, or other liquid; usually expressed in milligrams per liter, parts per million, or percent of saturation. Adequate concentration of dissolved oxygen is necessary for the life of fish and other aquatic organisms and the prevention of offensive odors.

drinking water standards: Drinking water standards established by state agencies, the US Public Health Service, and the EPA for drinking water throughout the United States.

drinking water standards (Nevada): The primary objective of Nevada's drinking water standards is to assure safe water for human consumption. To this end, the Nevada Department of Human Resources, Health Division—Consumer Health Protection has established statewide primary and secondary drinking water standards at least as rigorous as those required by the EPA. *Primary drinking water standards* limit contaminants (constituents) which may affect consumer health. *Secondary drinking water standards* were developed to deal with the aesthetic qualities of drinking water.

domestic well: A well on a property that serves the water needs of a single family residence pursuant to state law.

drought: There is no universally accepted quantitative definition of drought. Generally, the term is applied to periods of less than average precipitation over a certain period of time sufficiently prolonged to cause a serious hydrological imbalance. In a less precise sense, it can also signify nature's failure to fulfill the water wants and needs of man. (The definition of drought specific to this plan can be found in Chapter 2.)

ecosystem: A community of animals, plants, and bacteria, and its interrelated physical and chemical environment. An ecosystem can be as small as a rotting log or a puddle of water, but current management efforts typically focus on larger landscape units such as a mountain range, a river basin, or a watershed.

effluent: Discharged wastewater such as the treated wastes from sewage plants and septic tanks.

effluent reuse: Reusing wastewater from a treatment facility in lieu of other water sources for a variety of water uses including but not limited to irrigation, dust control, and aquifer recharge.

emergency: As referred to and limited in its application to policy 4.1.h, emergency means:

Acts of nature or man including but not limited to floods, earthquakes, volcanic eruptions, extreme weather, toxic spills, radiation events causing loss of water, wastewater and flood control facilities or capacity of these facilities to supply needs of the region.

Unforeseen events that can be defined as an emergency by a two-thirds vote of the RWPC and accepted by the Board

endangered species: Any plant or animal species (or distinct vertebrate population segment) on the verge of extinction throughout all or a significant area of its range; identified by the Secretary of the Interior as "endangered", in accordance with the 1973 Endangered Species Act.

endemic: (ecology) Confined to, or *indigenous* in, a certain area or region, as an endemic plant or animal.

environmental assessment (EA): A report on a proposed project or action that presents the first thorough examination of alternative plans to positively demonstrate that the environmental and social consequences of the project or action were considered. If it is shown that such activities would, in fact, significantly impact the environment or are otherwise deemed controversial, then an *environmental impact statement (EIS)* will normally be required.

environmental impact statement (EIS): A report required by Section 102(2)(c) of Public Law 91-190 for all major federal or federally funded projects which significantly impact on the quality of the human environment or are environmentally controversial. The EIS is a detailed and formal evaluation of the favorable and adverse environmental and social impacts of a proposed project and its alternatives. Also see *environmental assessment (EA)*.

evapotranspiration (ET): The combined processes by which water is transferred from the earth surface to the atmosphere; evaporation of liquid or solid water plus transpiration from plants. Evapotranspiration occurs through evaporation of water from the surface, evaporation from the capillary fringe of the groundwater table, and transpiration of groundwater by plants (phreatophytes) whose roots tap the capillary fringe of the groundwater table. The sum of evaporation plus transpiration.

facility: Pursuant to NRS 540A and for the purposes of the Regional Water Plan, facility(ies) means flood control, storm drainage, waste water or water infrastructure, including but not limited to, plants to treat waste water, interceptors, facilities to convey and store surface water, facilities to treat surface water, facilities to extract and convey underground water, facilities to treat and store underground water, devices to infiltrate storm water, regional facilities to control floods, facilities to control floods in single drainage basins and facilities for controlling floods which utilize storage of water underground to mitigate floods.

Federal Emergency Management Agency (FEMA): Agency responsible for administering the National Flood Insurance Program.

fish credit water: Specific to this plan, water reserved in upstream reservoirs for release for fisheries in the lower Truckee River and Pyramid Lake. Drought reserve water converts to fish credit water if snow-pack is deemed adequate on an agreed upon date.

flood hazard areas: Areas in an identified flood plain.

flood plain: The portion of the flood plain outside the floodway which is covered by floodwaters during the 100-year flood. It is generally associated with shallow, standing, or slowly moving water rather than deep, rapidly flowing water.

floodway: The channel of a river or stream and those parts of the flood plains adjoining the channel which carry and discharge the floodwater or flood flow of any river or stream.

Floriston Rates: rates of flow of in the Truckee River measured at the Farad Gage, consisting of average flows of 500 cubic feet per second each day from March 1 through September 30, and 400 cubic feet per second each day from October 1 through the last day of February.

flow augmentation: The addition of water to a stream especially to meet in-stream flow needs. (In this plan it also means addition of water to a stream to meet water quality standards.)

General Improvement District (GID): A public entity created under the provisions of NRS 318 and granted by the County Commission to provide specific services to a limited geographical area. A GID may be formed to provide one or a combination of services including road maintenance, parks and recreation activities, water and sanitary sewer service.

geothermal: Terrestrial heat, usually associated with water as around hot springs.

giardia: *Giardia lamblia* is a protozoan which causes gastrointestinal illness. It is found in surface waters and associated with wild animal waste. The EPA has mandated water treatment processes to help protect surface water supplies from *giardia*.

gray water: Wastewater from a household or small commercial establishment which specifically excludes water from a toilet, kitchen sink, or dishwasher, or water used for washing diapers.

greenbelt: An area where measures are applied to mitigate fire, flood, and erosion hazard including fuel management, land use planning, and development standards. More traditionally, an irrigated landscaped buffer zone between development and wildlands, usually put to additional uses (e.g. golf courses, park).

groundwater: Any subsurface water.

groundwater basin: A groundwater reservoir together with all the overlying land surface and underlying aquifers that contribute water to the reservoir. In some cases, the boundaries of the successively deeper aquifers may differ in a way that creates difficulty in defining limits of the basin. A groundwater basin could be separated from adjacent basins by geologic boundaries or by hydrologic boundaries.

groundwater discharge: Subsurface water discharge.

groundwater flow model: (1) A digital computer model that calculates a hydraulic head field for the modeling domain using numerical methods to arrive at an approximate solution to the differential equation of groundwater flow. (2) any representation, typically using plastic or glass cross-sectional viewing boxes, with representative soil samples, depicting groundwater flows and frequently used for educational purposes.

groundwater production facilities: A water supply well used by a water purveyor.

habitat: The native environment where a plant or animal naturally grows or lives.

hazardous material: An injurious substance including pesticides, herbicides, toxic metals and chemicals, liquefied natural gas, explosives, volatile chemicals, and nuclear fuels.

hydraulic gradient: (*i*) The gradient or slope of a water table or *piezometric surface* in the direction of the greatest slope, generally expressed in feet per mile or feet per feet. Specifically, the change in static head per unit of distance in a given direction, generally the direction of the maximum rate of decrease in head. The difference in hydraulic heads (h_1 or h_2) divided by the distance (L) along the flowpath, or $i = (h_1 \text{ or } h_2) / L$. A hydraulic gradient of 100 percent means a 1-foot drop in head in 1 foot of flow distance.

hydrographic area: (Nevada) The 232 subdivisions (256 hydrographic areas and hydrographic sub-areas) of the 14 Nevada hydrographic regions (or basins) as defined by the State Engineer's Office, Department of Conservation and Natural Resources, Division of Water Resources. Primarily these are sub-drainage systems within the 14 major drainage basins.

Hydrographic areas (valleys) may be further subdivided into hydrographic sub-areas based on unique hydrological characteristics (e.g. differences in surface flows) within a given valley or area.

hydrographic basin: This term is essentially synonymous with hydrographic area or sub-area as defined by the Nevada State Engineer's Office, Department of Conservation and Natural Resources, Division of Water Resources.

hydrology/geology matrix score: Refer to the RWPC's Southern Washoe County Groundwater Recharge Analysis (January 2001) in which a methodology was developed for determining whether a site is suitable for recharge.

hydropower: Power produced by falling water.

impervious: Resistant to or incapable of penetration by water or plant roots.

incidental recharge: Groundwater recharge (infiltration) that occurs as a result of human activities unrelated to a recharge project; for example, irrigation and water diversion (unlined canals). Also see *artificial* (or *induced*) *recharge*, *natural recharge*, and *perennial yield*.

incorporated city: Area(s) / neighborhood(s) organized for the purpose of self-government. Reno and Sparks are the only incorporated cities in Washoe County.

indigenous: Existing, growing, or produced naturally in a region.

induced recharge: The designed (as opposed to the natural or incidental) replenishment of groundwater storage from surface water supplies. There exist five common techniques to effect artificial recharge of a groundwater basin: (1) *water spreading,* consisting of the basin method, stream-channel method, ditch method, and flooding method, all of which tend to divert surface water supplies to effect underground infiltration; (2) *recharge pits* designed to take advantage of permeable soil or rock formations; (3) *recharge wells,* which work directly opposite of pumping wells although they have a limited scope and are better used for deep, confined aquifers; (4) *induced recharge,* which results from pumping wells near surface supplies, thereby inducing higher discharge toward the well; and (5) *wastewater disposal,* which includes the use of secondary treatment wastewater in combination with spreading techniques, recharge pits, and recharge wells to reintroduce the water to deep aquifers, thereby both increasing the available groundwater supply and also further improving the quality of the wastewater. Also referred to as *artificial recharge*. Also see *natural recharge*, *incidental recharge*, and *perennial yield*.

infiltration: The flow of fluid into a substance through pores or small openings. It connotes flow into a substance, unlike the word *percolation*, which connotes flow through a porous substance. Also the process whereby water passes through an interface, such as from air to soil or between two soil horizons.

influent: The input stream of a fluid, such as water into a reservoir or waste into a sewage treatment plant.

infrastructure: (1) An underlying base or foundation, especially for an organization or a system. (2) The basic facilities, services, and installation needed for the functioning of a community or society, such as transportation and communication systems, water and power lines, and public institutions including schools, post offices, and prisons.

in-stream flow: Non-consumptive water requirements which do not reduce the water supply. Examples of in-stream flows include (1) aesthetics—water required for maintaining flowing streams, lakes, and other bodies of water for visual enjoyment; (2) fish and wildlife—water required for fish and wildlife; (3) navigation—water required to maintain minimum flow for

waterborne commerce; (4) quality dilution—water required for diluting salt and pollution loading to acceptable concentrations; and (5) recreation—water required for outdoor water recreation such as fishing, boating, water skiing, and swimming.

inter-basin transfer (of water): A transfer or diversion of water (either ground or surface) from one drainage or hydrographic basin to another.

lagoon system: (water quality) Scientifically constructed ponds in which sunlight, algae, and oxygen interact to restore water to a quality equal to effluent from a secondary treatment plant.

land use: The primary or primary and secondary use(s) of land such as single family residential, multi-family residential, commercial, industrial, or agriculture. The description of a particular land use should convey the dominant character of a geographic area and thereby establish the types of activities that are appropriate and compatible with primary use(s).

load allocation: The portion of the pollution load of a stream attributable to human nonpoint source of pollution.

local flood management staff: 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.

low impact development: Low impact development (LID) is a new comprehensive land planning and engineering design approach with a goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds. This design approach incorporates strategic planning with micro-management techniques to achieve superior environmental protection, while allowing for development or infrastructure rehabilitation to occur. This innovative approach can be used to help meet a wide range of Wet Weather Flow (WWF) control and community development goals.

minimum stream flows: The specific amount of water reserved for support of aquatic life, minimization of pollution, or recreation. It is subject to the priority system and does not affect water rights established prior to its institution.

mitigation: An action designed to lessen or reduce adverse impacts; frequently used in the context of environmental assessment.

municipal service providers: Local governments or public or private utilities that provide for water supply, wastewater treatment, collection, disposal, effluent reuse or storm water / flood control services.

municipal water: Municipal water may come from either ground or surface water sources. Once water has entered a municipal water system, from whatever source, it will be considered municipal water.

National Environmental Policy Act (NEPA): A 1970 Act of Congress which is our basic national charter for protection of the environment.

National Flood Insurance Program (NFIP): A program for subsidizing flood insurance that is not privately available for properties subject to flood hazard.

native groundwater: (See *endemic.*) Groundwater originating and stored within a specific hydrographic basin.

natural recharge: The replenishment of groundwater storage from naturally occurring surface water supplies such as precipitation and stream flows. Also see *artificial* (or *induced*) *recharge*, *incidental recharge*, and *perennial yield*.

Negotiated Settlement: The generally used title for Public Law 101-618, omnibus legislation passed by the 101st Congress at the end of its 1990 session and intended to settle a number of outstanding disputes concerning the Truckee and Carson Rivers. The legislation authorized an ambitious environmental restoration program to benefit the Lahontan Valley wetlands, Pyramid Lake, and the lower Truckee River. It also established a framework for resolving separate but closely related water-resource conflicts involving the Pyramid Lake Paiute and Fallon Paiute-Shoshone Tribes, the Cities of Reno and Sparks, the States of Nevada and California, and the *Newlands Project*. The legislation contains two primary titles: TITLE I **-** The Fallon Paiute-Shoshone Indian Tribal Settlement Act and TITLE II - The Truckee–Carson–Pyramid Lake Water Rights Settlement Act. Four of the seven main elements of the Negotiated Settlement specific to this plan are:

- **Promote the Enhancement and Recovery of Endangered and Threatened Fish Species**—A recovery program is to be developed for the Pyramid Lake endangered fish species cui-ui *(Chasmistes cujus)* and the threatened fish species Lahontan cutthroat trout *(Oncorhynchus clarki henshawi)* in compliance with the Endangered Species Act and the Truckee–Carson–Pyramid Lake Water Rights Settlement Act. Water rights acquisitions are authorized for this purpose.
- **Encourage the Development of Solutions for Demands on Truckee River Waters**—An operating agreement is to be negotiated for the Truckee River—*The Truckee River Operating Agreement (TROA*), covering procedures for using storage capacity in upstream reservoirs in California consistent with recovery objectives for listed Pyramid Lake fishes. This includes the implementation of the terms and conditions of the *Preliminary Settlement Agreement* between SPPCo and the Pyramid Lake Paiute Tribe.
- **Pyramid Lake Paiute Tribe Issues Settlement**—A tribal economic development fund of $40 million was established for the Tribe to provide for the settlement of water, fish, and other issues. Another fund of $25 million was established for the Pyramid Lake fishery.
- **Interstate Water Apportionment Settlement**—Facilitate an interstate allocation of the water of the Truckee River, Carson River, and Lake Tahoe between the states of California and Nevada.

Newlands Project (Nevada): One of the first of the US Department of the Interior, Bureau of Reclamation's irrigation projects; completed in 1915 to provide water for domestic, irrigation, and other water needs to a defined service area in the town of Fernley and the lower Carson River Basin near the City of Fallon, Churchill County, in Western Nevada.

nitrogen: Natural element found in atmosphere, soil, and water. In aqueous state can take form as nitrate, nitrite, and ammonium, ammonia and nitrogen gas. High concentrations may cause harmful health effects and low concentrations can be fatal to freshwater fish. Safe Drinking Water Act sets limits of concentration. Often associated with animal and human waste.

No Adverse Impact: The results of activities that do not exacerbate flood damage to another property or community or are mitigated or have been accounted for within an adopted community-based plan.

non-consumptive use: Non-consumptive water use includes water withdrawn for use that is not consumed; for example, water withdrawn for purposes such as hydropower generation. This also includes uses such as boating or fishing where the water is still available for other uses at the same site. The terms *consumptive use* and *non-consumptive use* are traditionally associated with water rights and water use studies, but they are not completely definitive. No typical consumptive use is 100 percent efficient; there is always some return flow associated with such use either in the form of a return to surface flows or as a groundwater recharge. Nor are typically non-consumptive uses of water entirely non-consumptive. There are evaporation losses, for instance, associated with maintaining a reservoir at a specified elevation to support fish, recreation, or hydropower, and there are conveyance losses associated with maintaining a minimum stream flow in a river, canal, or ditch.

non-potable: Describes water that is not suitable for drinking.

non-point source pollution: Pollution discharged over a wide land area, not from one specific location. These are forms of pollution caused by sediment, nutrients, or organic and toxic substances originating from land use activities and carried to lakes and streams by surface runoff. Non-point source pollution occurs when the rate of materials entering these waterbodies exceeds natural levels. Non-point source pollution includes agricultural return flows that are "one specific location" when in a return flow ditch, but they are not regulated as "point sources" (requiring a discharge permit) under the *Clean Water Act*. See *point source*.

NRS 540A: Chapter 540A of the Nevada Revised Statutes. Creates the RWPC and other related items.

nutrients: Elements or compounds essential to life, including carbon, oxygen, nitrogen, phosphorus, and many others.

open space / open space use: Current employment of land, the preservation of which conserves and enhances natural or scenic resources, protects streams and water supplies, or preserves sites designated as historic pursuant to law.

peaking: Generally describing the peak water demand for municipal water systems and expressed as a ratio to base demand (e.g. 2:1 peaking).

percolation: The movement, under hydrostatic pressure, of water through the interstices of a rock or soil. (1) Movement of water within a porous medium such as soil without a definite channel. (2) The entrance of a portion of the stream flow into the channel materials to contribute to groundwater replenishment.

perennial stream: A stream that flows from source to mouth throughout the year.

perennial yield (groundwater): The amount of usable water of a groundwater reservoir that can be withdrawn and consumed economically each year for an indefinite period of time without causing long-term depletion of the groundwater reservoir. Also referred to as *safe yield*.

perfected water right: A water right which indicates that the uses anticipated by an applicant, and made under permit, were made for *beneficial use*. Usually, it is irrevocable unless voluntarily canceled or forfeited due to several consecutive years of nonuse. Also see *appropriation doctrine*.

permeability: For a rock or an earth material, the ability to transmit fluids. It is measured by the rate at which a fluid of standard velocity can move through a material in a given interval of time under a given *hydraulic gradient*. Permeability for underground water is sometimes expressed numerically as the number of gallons per day that will flow through a cross section of

1 square foot, at 60°F, under a hydraulic gradient of 100 percent. Permeability is equal to velocity of flow divided by hydraulic gradient.

permitted water right: The right to put surface or groundwater to beneficial use that is identified by a document issued by the Nevada State Engineer prior to the filing of satisfactory proof of "perfection of application" in accordance with NRS Chapter 533. If proof of beneficial use is accepted by the Nevada State Engineer, then the water right permit can be converted into a certificated water right. If proof of beneficial use is not made to or accepted by the Nevada State Engineer, then the right to claim title to the water may cease.

pH (hydrogen ion concentration): A convenient method of expressing the acidity or basicity of a solution in terms of the logarithm of the reciprocal (or negative logarithm) of the hydrogen ion concentration. The pH scale runs from 0 to 14; a pH value of 7.0 indicates a neutral solution. Values above 7.0 pH indicate basicity (basic solutions); those below 7.0 pH indicate acidity (acidic solution). Term originally derived from *Potential of Hydrogen*.

planning horizon: The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions that would influence the planning decisions. In Washoe County, the planning horizon is 20 years.

playa: Generally a dry or intermittently dry lakebed in the lowest spot of a closed valley. Salt contents are generally quite high.

point source pollution: Pollutants discharged from any identifiable point, including pipes, ditches, channels, sewers, tunnels, and containers of various types which require a discharge permit. Also see *non-point source pollution*.

point waste load allocation: The amount of a particular pollutant a point source (e.g. wastewater treatment facility) can discharge over a specified period of time into a receiving water. Allocations are a result of agreed upon water quality standards for a stream.

potable water: Water that is drinkable. Specifically, fresh water that generally meets the standards in quality as established in the EPA *Drinking Water Standards* for drinking water throughout the United States.

potential water supply deficiency: The difference between potential water supply requirements associated with existing commitments plus future potential water requirements (based on approved land use plans) and water supply availability, as determined by the current Water Resource Baseline or Water Resource Budget.

Preliminary Settlement Agreement (Nevada): An agreement reached between the Pyramid Lake Paiute Tribe and Sierra Pacific Power Company (SPPCo) on May 23, 1989. The agreement provides SPPCo the ability to store its water rights in federally operated reservoirs along the Truckee River in California at times when it is not needed for M&I water supply in the Reno-Sparks metropolitan area. In exchange, excess water in storage is used for fisheries when drought conditions are not in effect. Also, SPPCo forgoes its right to single-use hydroelectric flows in the Truckee River under the Orr Ditch Decree, thereby enabling the United States and the Tribe to store water for fishery benefit at certain times of the year. The agreement is incorporated into Public Law 101-618 (the Negotiated Settlement) by reference.

price elasticity: Measures the percentage change in quantity demanded in response to a percentage change in price.

primary treatment: The removal of suspended and floatable solids which will settle out of sewage and industrial wastes. Primary treatment plants generally remove 25 to 35 percent of biological oxygen demand and 45 to 65 percent of total suspended matter.

proposed projects: Projects that have not yet received local government approval. Types of project include anything that may have an impact on water resources, including but not limited to residential, commercial or industrial or recreational development, roads and airports.

proposed land use changes: Proposed land use changes include master plan, land use or zoning changes or changes to the Truckee Meadows Services Area boundary.

reasonable development potential: The 2003 Regional Plan Update identifies a preferred pattern of development in the region, specifically in Regional Plan policies 1.2.1 and 1.2.2. This preferred pattern of development includes a focus on downtown development and infill as well as intensification along transit corridors. In some areas of the community, the zoning has no upper limit and, therefore, allows for infinite densities, at least in theory. In reality, infill and intensification will occur at a reasonable rate, and certain assumptions about development potential are used to reflect that development potential.

recharge: Flow to groundwater storage from precipitation, infiltration from streams, and other sources of water.

reclaimed wastewater: Wastewater that becomes suitable for a specific beneficial use as a result of treatment or brackish water demineralized for use.

reclamation: The act of reclaiming or cleaning up contaminated groundwater, usually as a result of toxic waste. Also the reclaiming of waste, desert, marshy, or submerged land for cultivation, preservation, reuse, etc.

Region: The portion of Washoe County within the jurisdiction of the RWPC generally described as all lands within Washoe County south of Township 25, excluding the Lake Tahoe watershed, Pyramid Lake Paiute Indian Reservation, and other tribal trust lands.

Regional Wastewater Reclamation Facilities Master Plan: The three local governments contracted with Carollo Engineers to develop a Regional Wastewater Reclamation Facilities Master Plan. This work was used to develop the majority of the wastewater element of the 1995–2015 Regional Water Plan.

regression analysis: A statistical technique used to establish relationships between variables.

remediation: Corrective action often associated with groundwater depletion or contamination. See reclamation.

retrofit: To furnish or provide with new equipment or parts unavailable at the time of original manufacture or construction.

reuse: Water that is discharged by one user and used by others. It can also mean water discharged by one unit and used by other units in the same plant.

reverse osmosis: (water quality) An advanced method of water or wastewater treatment that relies on a semi-permeable membrane to separate waters from pollutants. An external force is used to reverse the normal osmotic process, resulting in the solvent's moving from a solution of higher concentration to one of lower concentration.

riparian: Related to or located on the bank of a natural watercourse.

riparian habitat: The land and plants bordering a watercourse or lake.

rural: When used in the context of the Truckee Meadows Regional Plan, rural development areas include residential uses on lots of over one acre in size, up to ten acres, and supportive non-residential and public development.

safe yield: The rate at which water can be withdrawn from an aquifer without causing eventual depletion or contamination of supply. More commonly referred to as *Perennial Yield* and *Sustained Yield*. Generally consists of the rate of *natural recharge*, *artificial* (or *induced*) *recharge*, and *incidental recharge*.

satellite plant: (water quality) Specific to this plan, a wastewater treatment facility in an outlying area, not connected to the main plant.

secondary treatment: (water quality) Treatment (following primary treatment) which generally removes 80 to 95 percent of the biochemical oxygen demand and suspended matter. It may be accomplished by biological or chemical-physical methods. Activated sludge and trickling filters are two of the most common means of secondary treatment. Secondary treatment provides very little nutrient removal.

sedimentation: Strictly, the act or process of depositing sediment from suspension in water. Broadly, all the processes whereby particles of rock material are accumulated to form sedimentary deposits. Sedimentation, as commonly used, involves not only aqueous but also glacial, aeolian, and organic agents.

Senate Bill 101: Amends NRS 540.101, requiring the State Water Planning Division to coordinate with local governments in developing a State water plan, makes a State water plan mandatory, and other related issues.

Senate Bill 360: Requires a water conservation plan from most purveyors, and other related issues.

septic system: An on-site treatment system consisting of a septic tank, a disposal field and interconnecting lines. Septic systems are normally used when more advanced treatment alternatives are not available.

septic tank: (1) A sewage disposal tank in which a continuous flow of waste material is decomposed by anaerobic bacteria. (2) A tank used to detain domestic wastes to allow the settling of solids prior to distribution to a leach field for soil absorption.

service: A connection served by a utility.

significant hydrologic resources (SHR): When used in the context of the Truckee Meadows Regional Plan, significant hydrologic resources are either federally significant (e.g. wetlands meeting federal definition) or regionally significant (e.g. stream environments, playas, spring-fed stands of riparian vegetation, and wetlands not meeting the federal definitions).

sludge: (1) Semisolid material such as the type precipitated by sewage treatment. (2) Mud, mire, or ooze covering the ground or forming a deposit, as on a riverbed.

smart growth: An approach to development that has grown out of the concern that current development patterns, dominated by "sprawl", are no longer in the long-term interest of cities, towns or rural communities. Although its definition may be open to interpretation and principles flexible, smart growth advocates generally agree that the most effective approach is to minimize sprawl and to maximize the use of space in existing urban developments through housing infill, mixed land use, and other projects that increase population density, including transit-oriented development, with easily-accessible transit centers.

special assessment district: A legally established area for the express purpose of levying a special fee for public improvements that are of a special rather than general benefit.

sphere of influence: When used in the context of the Truckee Meadows Regional Plan, the area adjacent to a city's incorporated area, planned for urban and/or suburban development, into which the city may annex during the plan's time frame.

spread: Method of recharging a groundwater basin by diverting water to a highly pervious area for percolation into the basin.

sub-basin: (1) A portion of a sub-region or basin drained by a single stream or group of minor streams. (2) The smallest unit into which the land surface is subdivided for hydrologic study purposes.

subdivision: Any land, vacant or improved, which is divided or proposed to be divided into five or more lots (versus a parcel map for four or less), parcels, sites, units, or plots for the purpose of any transfer or development or any proposed transfer or development of the original parcel.

suburban: When used in the context of the Truckee Meadows Regional Plan, suburban development includes residential uses at generally one to three single family units per acre and supportive nonresidential and public development.

surface water: Water on the surface of the earth. Surface water withdrawals include water taken from streams, rivers, ponds, lakes, reservoirs, and springs and all effluent and other wastewater.

sustainable yield: The sustainable yield of a resource or combination of resources is the quantity of water that may be diverted in a specific period of time (usually a year, but may be other units of time) that is consistent with protecting the social, environmental and economic uses of the water resources. For an aquifer, this quantity may be related to the average annual recharge, with adjustments to reflect: the protection of important environmental uses of groundwater, to account for economic impacts of increased pumping lift and drilling costs, and to account for changes in recharge that may occur due to urbanization and artificial recharge.

For surface water resources, the sustainable yield is a function of many factors including the seasonal variations in flow of the source, seasonal pattern of the demand to be satisfied, the quantity and priority of the water rights available for use, the availability and management of storage, and its conjunctive use with other resources including groundwater. It is recognized that sustainable yield may be determined and revised from time to time utilizing new reports and information developed by recognized agencies and sources.

threatened species: Any plant or animal species likely to become an “endangered” species in the foreseeable future throughout all of the significant area of its range or natural habitat; identified by the Secretary of the Interior as “threatened” in accordance with the 1973 Endangered Species Act.

total maximum daily load: The maximum quantity of a particular water pollutant that can be discharged into a body of water without violating a water quality standard.

transpiration: (1) The quantity of water absorbed, transpired, and used directly in the building of plant tissue during a specified time period. It does not include soil evaporation. (2) The process by which water vapor escapes from a living plant, principally through the leaves, and enters the atmosphere.

Tribe: In this plan, the Pyramid Lake Paiute Tribe of Indians.

tributary: A stream that joins another stream or body of water.

trihalomethane: Disinfection by-product formed when chlorine (as a disinfectant for municipal water supplies) is added to water that contains organic matter. Concentrations are regulated by the Safe Drinking Water Act.

Truckee River Operating Agreement: The Truckee River Operating Agreement is incorporated in Section 205 of *Public Law 101–618* (the *Negotiated Settlement*) and requires that the US Secretary of the Interior negotiate an operating agreement for the Truckee River with the States of Nevada and California, and other parties. The intent of the TROA is to supplant the current *Truckee River Agreement* and provide for the comprehensive management of the Truckee River waters in California and Nevada, as well as to provide important long-term drought protection for the Reno–Sparks (Nevada) Metropolitan Area.

The primary purpose of the TROA is to improve management of Truckee River reservoirs located in California by expanding existing operations for the benefit of M&I water use, increase drought storage, aid in the recovery of endangered and threatened fish species, and, in general, improve fish and wildlife habitat within the Truckee River Basin. This would be accomplished by "networking" reservoir releases and storage (i.e., unify reservoir operations for a common objective and into a single schedule) in a manner that would not infringe on existing water storage, release, or use rights or flood control requirements. The TROA would also allow for the exchange, transfer, and release of waters from the upstream reservoirs to improve the likelihood of maintaining in-stream flows for fish and wildlife. The TROA is intended to provide a number of substantive benefits to users of Truckee River waters. These benefits may be listed in four fundamental areas:

> [1] ***Reservoir Management*** — Improve river flow and river management by improving flexibility, coordinate reservoir storage and release, allow transfers and exchanges among various reservoirs to reduce spills, provide for recreational pools, etc., create a water credit system, promote more efficient use of existing water supplies, allow for the storage of "other waters", centralize Truckee River water management, improve water accounting (budgeting) and forecasting, eliminate releases solely for power generation, permit storage of water savings from conservation in the Reno–Sparks Metropolitan Area, and provide for greater water marketing among private water rights holders;
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> [2] ***Fish and Wildlife*** — Enhance spawning potential of the Pyramid Lake endangered cui-ui (Chasmistes cujus) and threatened Lahontan cutthroat trout (Oncorhynchus clarki henshawi) fish species through improved overall river operations, commitment of specified waters, increased water availability, and mitigation of significant adverse environmental impacts;
>
> [3] ***M&I Use*** — Provide additional M&I drought relief storage for the Reno–Sparks Metropolitan Area through an M&I Water Credit System;
>
> [4] ***Conservation*** — Promote water conservation in the Reno–Sparks Metropolitan Area through water metering and various conservation programs.

turbidity: The term "turbid" is applied to water containing suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. The turbidity may be caused by a wide variety of suspended materials, such as clay, silt, finely divided organic matter, microscopic organisms, and similar substances. Turbidity in water has public health implications due to the possibilities of pathogenic bacteria encased in the particles and thus escaping disinfection processes. Turbidity interferes with water treatment (filtration) and affects aquatic life. Excessive amounts of turbidity also make water aesthetically objectionable.

urban: When used in the context of the Truckee Meadows Regional Plan, urban development is development of three or more residential units per acre, and comparable non-residential and public development.

vested water right: The water right to use either surface or groundwater acquired through more or less continual beneficial use prior to the enactment of water law pertaining to the source of the water. These claims become final through adjudication. Also see *certificated water right* and *perfected water right*.

visual resource: The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors.

volatile organic chemicals (VOCs): Chemicals of an organic nature (containing hydrogen, oxygen, and carbon) which readily volatilize, or travel from water into air. Most such substances are industrial chemicals and solvents. The EPA maintains a listing of VOCs that are regulated with respect to maximum contaminant levels (MCLs) as part of the Safe Drinking Water Act.

waste load allocation: A system designed to limit the total discharge of pollutant materials into a receiving body of water.

wastewater: (1) Water that carries wastes from homes, businesses, and industries; a mixture of water and dissolved or suspended solids. (2) That water for which, because of quality, quantity, or time of occurrence, disposal is more economical than use at the time and point of its occurrence. Wastewater to one user may be a desirable supply to the same or another user at a different location.

water balance: An accounting of all the inputs and outputs of a hydrologic system.

water budget: An accounting of the inflows and outflows of water to and from a system.

water conservation: (1) Any beneficial reduction in water use or water loss. (2) A reduction in consumptive use, diversions from the Truckee River, and groundwater pumping.

Water Planning Commission: Washoe County Regional Water Planning Commission created pursuant to NRS 540A

water purveyors: Refers to public and private utilities that provide water service pursuant to state law.

water quality: A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose. Also see *drinking water standards* and *drinking water standards (Nevada)*.

water quality standard: A plan for water quality management specifying the use (recreation, fish and wildlife propagation, drinking water, industrial or agricultural, etc.) to be made of the water; criteria to measure and protect these uses; implementation and enforcement plans; and an antidegradation statement to protect existing water quality.

water resource: All surface, ground, and wastewater in a specified area.

water rights: (Nevada) The legal rights to the use of water. They consist of adjudicated water rights, *appropriative water rights*, and reserved water rights.

watershed: (1) All lands enclosed by a continuous hydrologic drainage divide and lying upslope from a specified point on a stream. Also referred to as *water basin*. (2) A ridge of

relatively high land dividing two areas that are drained by different river systems. Also referred to as *water parting*.

watershed rule: In response to the EPA's withdrawal of the July 2000 final "TMDL" rule, the agency is now working on a regulation known as the Watershed Rule. EPA reports that the proposed rule is an information-based approach to watershed planning and a better way of addressing impaired waters. EPA envisions a framework that advances state and local efforts to achieve the highest attainable designated uses by promoting flexible and effective watershed approaches. An unofficial draft rule proposes to revise the impaired waters program and support pollutant trading within watersheds. The proposed rule would involve revision to the Water Quality Planning and Management Regulation and the NPDES sections of the Clean Water Act.

water yield: Runoff, including groundwater outflow that appears in the stream, plus groundwater outflow that leaves the basin underground. Water yield is the precipitation minus the *evapotranspiration*.

wellhead: (1) The source of a well or stream; (2) A principal source, a fountainhead. (3) The physical structure, facility, or device at the land surface from or through which groundwater flows or is pumped from subsurface, water-bearing formations.

wellhead protection program (WHPP): Programs intended to protect and preserve the quality of groundwater used as a source of drinking water. A typical wellhead protection program will have a number of critical elements to include (1) delineating the roles and responsibilities of state agencies, local governments, and water purveyors; (2) delineation of wellhead protection areas; (3) contaminant source inventories; (4) management options; (5) siting of new wells; (6) contingency and emergency planning; and (7) public participation. Typically, steps taken to protect and preserve the quality of a well are far less costly than actions necessary to restore a contaminated well.

wellhead protection area: Specific capture zone delineations contained in approved wellhead protection programs, or, in the absence of an approved wellhead protection program, a 2,500 foot radius circle around existing and planned groundwater production wells or domestic wells.

wetlands: An area at least periodically wet or flooded, where water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (e.g. bogs, marshes, swamps, mudflats, and fens).

wildland: A non-urban, natural area which contains uncultivated land, timber, range, watershed, brush, or grassland.

"worst drought of record": The series of years when water supply was the least ever recorded. In this plan, that period is from 1987 through 1994.

zoning: A local ordinance that divides a community into districts and specifies allowable uses and development standards for each, consistent with the adopted community master plan.