

4.7 HYDROLOGY AND WATER QUALITY

This section summarizes information on hydrology, flooding and water quality in Truckee and its Sphere of Influence. It also provides an evaluation of the effects that the Truckee 2025 General Plan would have on these environmental factors.

A. Existing Setting

The following describes the existing setting in Truckee in regards to water quality; drainage systems; flooding and dam inundation hazards; and seiche, tsunamis and mudflows. Applicable regulations, plans, and policies are also discussed.

1. Regional Setting

The Town of Truckee lies within the Martis Valley Region of the Greater Truckee River Basin. The region covers about 70 square miles in eastern Nevada and Placer Counties.¹

a. Truckee River Basin

The Truckee River Basin encompasses approximately 3,060 square miles in the states of California and Nevada.² Its headwaters lie in the Sierra Nevada Mountains above Lake Tahoe and its end is in Pyramid Lake, a terminal lake in the Nevada desert.³ The Truckee River is Lake Tahoe's only outlet, flowing north from the lake at Tahoe City, and continuing 15 miles until it reaches the Town of Truckee. In Truckee, the river merges with the Donner Lake drainage area west of the Town, the Martis Creek drainage to the south

¹ Pacific Municipal Consultants, *Old Greenwood Planned Development Draft Environmental Impact Report (SCH# 2001102077)*, February, 2002.

² Ricci, Hugh. *Truckee River Chronology: A Chronological History of Lake Tahoe and the Truckee River and Related Water Issues*. State of Nevada Dept. of Conservation & Natural Resources, Division of Water Resources: <http://water.nv.gov/water%20planning/truckee/truckee1.htm>, accessed February 17, 2006.

³ A "terminal lake" is define as a lake without an outlet.

and east of the Town, and the Prosser Creek, Trout Creek and Little Truckee River drainages to the north and east, before continuing east 90 miles to its terminus.

b. Precipitation

About 75 percent of the region's annual precipitation falls during the winter months. Much of the precipitation falls as snow or mixed rain resulting from storms during winter and early spring months. Precipitation during the summer is primarily associated with convection cell thunderstorms. The crest of the Sierra Nevada mountains to the west of Truckee generates a distinct rain shadow to the east of its main ridge. This causes a dramatic variation in annual precipitation from nearly 40 inches a year in the western portion of the Martis Valley region at the Donner Memorial State Park to about 23 inches a year in the eastern part of the region at Boca.⁴

2. Regulatory Setting

A number of federal, State and local regulations are concerned with water quality, flood protection, and infrastructure for storm water conveyance and discharge. The most important of these are described below.

a. Federal Water Pollution Control Act (Clean Water Act)

The Clean Water Act (CWA), initially passed in 1972, regulates the discharge of pollutants into watersheds throughout the nation. Section 402(p) of the Clean Water Act establishes a framework for regulating municipal and industrial storm water discharges under the National Pollutant Discharge Elimination System (NPDES) Program.⁵ Section 402(p) requires that storm water

⁴ Pacific Municipal Consultants, *Old Greenwood Planned Development Draft Environmental Impact Report (SCH# 2001102077)*, February 2002.

⁵ Authorized by the Clean Water Act, the permit program controls water pollution by regulating point sources (discrete conveyances such as pipes or man-made ditches) that discharge pollutants into waters of the United States. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. In most

associated with industrial activity that discharges either directly to surface waters or indirectly through municipal storm sewers must be regulated by a NPDES permit. On December 8, 1999, the United States Environmental Protection Agency (EPA) circulated Phase II regulations for non-point sources requiring permits for stormwater, including discharges from Small Municipal Separate Storm Sewer System (MS4s) operators.⁶ In California, the NPDES Program is administered by the State.

Under Section 404 of the Clean Water Act, a permit must be obtained from the US Army Corps of Engineers (USACE) prior to discharge of dredged or fill material into waters of the United States, including wetlands. The purpose of this program is to ensure that water quality is protected from polluting discharges.⁷

b. Federal Emergency Management Agency

Floodplain zones are determined by the Federal Emergency Management Agency (FEMA) and are used to create Flood Insurance Rate Maps (FIRMs). These tools assist cities and towns in mitigating flooding hazards through land use planning and building permit requirements. To address the need for insurance to cover flooding issues, FEMA administers the National Flood Insurance Administration (NFIA) program. The NFIA program provides federal flood insurance and federally-financed loans for property owners in flood prone areas. To qualify for federal flood insurance, cities and towns must identify flood hazard areas and implement a system of protective controls. FEMA stipulates minimum guidelines to regulate floodplain development including no development within the 100-year floodplain.

cases, the NPDES permit program is administered by authorized states with oversight from the EPA. <http://cfpub.epa.gov/npdes/>, accessed January 31, 2006.

⁶ Small MS4s are publicly owned conveyances or conveyance systems of ditches, curbs or underground pipes that divert stormwater into the surface waters of the State. <http://www.des.state.nh.us/StormWater/ms4.htm>, accessed June 8, 2005.

⁷ Environmental Protection Agency : <http://www.epa.gov/r5water/cwa.htm>, accessed March 10, 2006.

c. State Water Resources Control Board

The State Water Resources Control Board (SWRCB) is responsible for implementing the CWA and does so through issuing NPDES permits to cities and counties through regional water quality control boards (RWQCB). Federal regulations allow two permitting options for stormwater discharges - individual permits and general permits. The California SWRCB elected to adopt a statewide general permit (Water Quality Order No. 2003-0004-DWQ) for Small Municipal Separate Storm Sewer System (MS4s) operators covered under the CWA to efficiently regulate stormwater discharges under a single permit. Permittees must meet the requirements in Provision D of the General Permit, which require development and implementation of a Storm Water Management Plan (SWMP) with the goal of reducing the discharge of pollutants to the maximum extent practicable. Currently, the Town of Truckee is not subject to NPDES permit requirements because of its size. However, with future growth, compliance will be necessary and the Town is planning accordingly. Through the collection of a facilities impact fee, the Town is raising money to complete an inventory of the current drainage system to better assess whether it will be adequate to meet future NPDES requirements.⁸

d. Regional Water Quality Control Board

The State's Porter-Cologne Water Quality Control Act outlines the specific responsibilities of the RWQCBs, and the procedures for coordinating with the SWQCB to meet federal CWA standards. Eastern Nevada County and the Town of Truckee are within the Lahontan Regional Water Quality Control Board's (LRWQCB) jurisdiction, which covers a large region encompassing all of California east of the Sierra Nevada crest, from the Oregon border to the northern Mojave Desert. The LRWQCB targeted the Truckee and Upper Truckee watersheds as high priorities for implementing RWQCB programs because of their resource value and known water quality problems.⁹

⁸ Pat Perkins, Senior Town Engineer for the Town of Truckee. Personal communication with Shay Boutillier, DC&E, March 28, 2006.

⁹ Town of Truckee Downtown River Revitalization Strategy, 2005. Town Council Resolution No. 2005-52.

The LRWQCB produced a Basin Plan for the Truckee River and its tributaries that outlines beneficial uses of these water features and addresses concerns over adverse effects to these resources from sources of water pollution.¹⁰ Water quality issues for the Truckee River are described in greater detail in section A.5 below.

e. Assembly Bill 3030, Groundwater Management Plan

The Groundwater Management Act of the California Water Code (AB 3030), provides guidance for applicable local agencies to develop a voluntary Groundwater Management Plan (GMP) in State-designated groundwater basins. GMPs can allow agencies to raise revenue to pay for measures influencing the management of the basin including extraction, recharge, conveyance, facilities' maintenance and water quality.¹¹ The Truckee Donner Public Utility District (TDPUD) adopted a GMP for the entire Martis Valley Basin in 1998.

f. Inter-State Regulations

Approximately 25 percent of the Truckee River Basin's total area lies within the State of California and 75 percent lies in Nevada. While the greater portion of the Truckee River Basin's surface area and most of the demand for its water resources lie within the State of Nevada, most of the precipitation and all of the basin's water storage occurs within California.¹² This imbalance has led to long-standing controversy over the rights to and uses of the Truckee River water resources. In order to resolve these issues, California and Nevada legislatures approved the "California-Nevada Interstate Compact" in 1970 and

¹⁰ Pacific Municipal Consultants *Old Greenwood Planned Development Draft Environmental Impact Report (SCH# 2001102077)*, February 2002.

¹¹ California Department of Water Resources :
http://www.groundwater.water.ca.gov/water_laws/ab3030_gma/index.cfm.

¹² Ricci, Hugh. *Truckee River Chronology: A Chronological History of Lake Tahoe and the Truckee River and Related Water Issues*. State of Nevada Dept. of Conservation & Natural Resources, Division of Water Resources:
<http://water.nv.gov/water%20planning/truckee/truckee1.htm>, accessed February 17, 2006.

1971. This agreement allotted approximately 90 percent of the Truckee River Basin's waters to the State of Nevada, while reserving water supplies for growth in the Lake Tahoe-Truckee area in California.¹³

The regulation of the Truckee River's water flow dates back to long standing contracts and interstate agreements from the early 20th Century. Agreements, such as the 1908 Floriston Rates, the 1915 Truckee River General Electric Decree, the 1935 Truckee River Agreements and the 1944 Orr Ditch Decree dealt with allocation of water rights and flows for electricity generation, where a minimum flow of between 300 and 500 cubic feet per second must be maintained at the state line.¹⁴ The Draft Truckee River Operating Agreement, created in May 1996 and updated in October of 2003 by representatives of federal, State and local agencies, utilities companies and local Native American tribes, intends to better coordinate reservoir operations in order to meet existing water rights agreements while meeting other important objectives, such as habitat preservation for endangered fish species, increasing drought protection for the growing Reno-Sparks metropolitan area, improving water quality, and enhancing stream flows for recreational uses in both states.¹⁵

g. Town of Truckee Development Code

The Town of Truckee's Development Code contains a number of provisions concerning development adjacent to the Truckee River, tributary creeks and drainages, as well as surface water bodies such as Donner Lake. These regulations address potential impacts to water quality from new development, grading, and erosion, as well as development within flood-prone areas.

¹³ Wilds, Leah et. al., Fall 1994. *Reclamation and the Politics of Change: Rights settlement Act of 1990* Nevada Historical Society Quarterly, Volume 37, number 3, pp. 180-181.

¹⁴ Town of Truckee Downtown River Revitalization Strategy, 2005. Town Council Resolution No. 2005-52.

¹⁵ California Department of Water Resources:
<http://www.cd.water.ca.gov/cnwa/cna.cfm>, accessed February 21, 2006.

Development Code Article III, Chapter 18.34 strictly regulates development within all FEMA or FIA identified special flood hazard areas. Chapter 18.3 also regulates drainage and storm water runoff by requiring preparation of drainage and erosion control plans as part of the building permit application process, in accordance with guidelines established by the LRWQCB, and statewide stormwater Best Management Practices.¹⁶

The Town of Truckee's Building Division requires an erosion protection plan for all new building construction and grading activity within the Town limits. Erosion protection plans must depict erosion protection measures to be installed on disturbed areas so as to prevent sediment from being mobilized and transported into nearby watercourses.¹⁷

3. Regional Surface Hydrology

Within the Town of Truckee, the Truckee River merges with the Donner Lake drainage area west of the Town, the Martis Creek drainage to the south and east of the Town, and the Prosser Creek, Trout Creek and Little Truckee River drainages to the north and east of the Town. All of these drainages join to form part of the greater Truckee River Basin. In addition to the Truckee River and its tributaries, several prominent water bodies lie within the Town's boundaries. Central to these are a series of reservoirs, created for water storage and controlled flows to lessen the impact of flooding in the region and further downstream.

Donner Lake drains an area of approximately 14 square miles and has a storage capacity of 9,500 acre-feet.¹⁸ Originally dammed in 1877, its current dam was constructed in the 1930s. Rights to the water in the lake are privately

¹⁶ Town of Truckee Municipal Code on the Town of Truckee : <http://www.townoftruckee.com/DCCh030.html>, accessed February 28, 2006.

¹⁷Town of Truckee: <http://www.townoftruckee.com/DCCh030.html>, accessed February 28, 2006.

¹⁸ Acre-feet refers to the volume of water that will cover an area of 1 acre to a depth of 1 foot. One acre-foot equals 43,560 cubic feet of water.

owned by the Sierra Pacific Power Company (SPPCo) of Reno, Nevada and the Truckee-Carson Irrigation District (TCID).

The Martis Creek drainage encompasses an area of 40 square miles, including Martis Creek, West, Middle and East Martis Creek, which feed into the Martis Creek Reservoir, located just above Martis Creek's confluence with the Truckee River. This reservoir was constructed in 1971 by the USACE for flood control purposes, and has a storage capacity of 20,000 acre-feet. However, only temporary storage is currently allowed due to a leaking dam.¹⁹

Prosser Creek Reservoir lies upstream of Prosser Creek. This reservoir was constructed in 1962 by the United States Bureau of Reclamation (USBR). With a capacity of approximately 30,000 acre-feet, the reservoir stores water from a 50-square-mile drainage.

The Little Truckee River is the largest of the Truckee River's tributaries. Its drainage basin contains the Boca Reservoir, which drains an area of 172 square miles with a storage capacity of 40,800 acre-feet; Stampede Reservoir, which drains an area of 136 square miles, has a storage capacity of 226,000 acre-feet; and Independence Lake/Reservoir, which drains an area of 8 square miles, has a storage capacity of 17,500 acre-feet.

4. Regional Groundwater

a. Groundwater Supply

The Town Truckee obtains its water supply from the Martis Valley Groundwater Basin. The basin is a low lying area of approximately 57 square miles that is completely contained within a larger watershed of approximately 167 square miles. The basin has a total subsurface storage volume of 484,000 acre-

¹⁹ Ricci, Hugh. *Truckee River Chronology: A Chronological History of Lake Tahoe and the Truckee River and Related Water Issues*. State of Nevada Dept. of Conservation & Natural Resources, Division of Water Resources: <http://water.nv.gov/water%20planning/truckee/truckee1.htm>, accessed February 17, 2006.

feet and is made up of three aquifers composed of sediments and volcanic deposits nearly 1,000 feet thick.²⁰ Infiltration from surface water and precipitation supplies the upper unconfined aquifer system, which in turns feeds adjacent wetland areas. Annual groundwater recharge depends heavily on snowmelt in the late spring and early summer, from April through June.²¹ The basin-wide annual recharge is estimated at 29,165 acre-feet per year (AFY).

TDPUD, Placer County Water Agency (PCWA) and the Northstar Community Services District (NCSD), which all depend on the Martis Valley Basin for water supply, have conducted studies of the basin's capacity. The outcome of the most recent evaluation, completed by Nimbus Engineering in 2001, concluded that available water in the basin was adequate to serve the projected buildout of these collective service areas.²² Given the total subsurface storage and sustainable yield of 24,000 AFY, there is enough available water in the basin for the next 20 years of service even if no recharge occurred.²³ Since recharge will continue to occur, the actual yield of the Basin can be expected to be sustainable over a longer period.

b. Groundwater Quality

The Town of Truckee obtains its potable water supply from semi-confined to confined deep-seated aquifers within the Martis Valley Groundwater Basin. According to the 2001 Water Master Plan Update, groundwater quality met all current water quality standards in regards to allowable levels of regulated pollutants.²⁴ Data gathered by the TDPUD indicates that the current water

²⁰ Truckee Donner Public Utility District (TDPUD) *Urban Water Management Plan*, adopted November 2005.

²¹ Pacific Municipal Consultants *Old Greenwood Planned Development Draft Environmental Impact Report (SCH# 2001102077)*. February 2002.

²² Mike Vaughan, Town of Truckee Public Works Division. Personal communication with Shay Boutillier, DC&E, March 3, 2006.

²³ Truckee Donner Public Utility District (TDPUD) *Urban Water Management Plan*, adopted November 2005.

²⁴ Truckee Donner Public Utility District, *Water Master Plan Update*, January 2001.

supply system and its contents are in compliance with existing State maximum contaminant levels (MCLs).²⁵ Arsenic levels in all of Truckee’s wells but one comply with current allowable levels of 10 parts per billion (ppb), which was established by the United States EPA to take effect in January 23, 2006.²⁶

5. Water Quality

Surface water within the Truckee River Basin primarily originates as mountain snowmelt of good water quality. However, exposure to pollutants and sedimentation generated from human activity and development has impaired reaches of the River within the vicinity of Truckee.²⁷ According to the LRWQCB, the Truckee River is on the Clean Water Act Section 303(d) list of impaired water bodies for elevated levels of sedimentation, iron and phosphorus and RWQCBs “Watch List” for chloride and total dissolved solids (TDS).²⁸ “Impaired” refers to water bodies that do not or are not expected to meet water quality standards despite compliance with NPDES permit requirements.²⁹

Water quality in other tributaries and adjacent waterbodies to the Truckee River has been found to be impaired due to elevated methyl tertiary-butyl

²⁵ 2004 Water Quality Report for the Truckee Water System #2910003. Prepared by the Truckee Donner Public Utility District.

²⁶ 2004 Water Quality Report for the Truckee Water System #2910003. Prepared by the Truckee Donner Public Utility District.

²⁷ Olsen, Cadie. *Is the Truckee River Polluted? Sedimentation is a serious, but preventable, threat to the river ecosystem.* Lahontan Regional Water Quality Control Board : <http://www.waterboards.ca.gov/rwqcb6/sites/Sedimentation.htm>, accessed May 1, 2006.

²⁸ Clean Water Act Section 303(d) list of impaired water bodies: <http://www.swrcb.ca.gov/tmdl/docs/2002reg6303dlist.pdf>, accessed February 27, 2006.

²⁹ Town of Truckee Downtown River Revitalization Strategy, 2005. Town Council Resolution No. 2005-52.

ether (MTBE) levels. These waterbodies include Summit Creek and Donner Lake.³⁰ In addition, Martis Creek is on the LRWQCB “Watch List” for nutrients.³¹ To improve water quality of water features in the surrounding Truckee Area including Donner Lake, the LRWQCB and the TDPUD have passed resolutions to improve water quality by prohibiting the “...discharge or threatened discharge, attributable to human activities, of solid or liquid waste materials including soil, silt, clay, sand, and other organic or earthen materials to lands within the 100-year floodplain of the Truckee River or any tributary to the Truckee River.”³²

In addition, the California Department of Water Resources (DWR) and the LRWQCB are currently operating and maintaining three water quality monitoring stations along the Truckee River. The data obtained through monitoring quantifies Total Maximum Daily Loads (TMDL), which help define the extent of sediment delivery reduction that is necessary to bring the waterway into attainment with applicable water quality standards.³³

6. Existing Drainage and Storm Water Disposal

The Town of Truckee maintains a public storm drainage system that discharges into the Truckee River.³⁴ The Town enforces regulations to ensure that water quality of the municipal storm water discharge is in compliance

³⁰ University of California at Davis Tahoe Research Group: <http://trg.ucdavis.edu/research/mtbe.html>, accessed March 19, 2006.

³¹ Pacific Municipal Consultants *The Northside Draft Environmental Impact Report*, Prepared for Placer County, December 2005.

³² Lahontan Regional Water Quality Control Board (LRWQCB) and Truckee Donner Public Utility District (TDPUD) resolution R6T-2004-0032 *Donner Lake Water System Improvements, Phase 2*. Found on the LRWQCB website: http://www.swrcb.ca.gov/rwqcb6/Adopted_Orders/2004/BO_Num_2004.htm, accessed March 19, 2006.

³³ California Department of Water Resources: <http://www.cd.water.ca.gov/cnwa/truckeeriverWQ.cfm>, accessed February 27, 2006.

³⁴ Mike Vaughan, Town of Truckee Public Works Division. Personal Communication with Shay Boutillier, DC&E, March 3, 2006.

with the LRWQCB's Truckee River Hydrologic Unit Project Guidelines.³⁵ The Town of Truckee's Municipal Code regulates activities influencing the quality of the municipal storm water discharge such as land development projects.

Currently, storm water runoff from the Town of Truckee impacts the Truckee River by contributing to stream bank erosion and the transport of contaminants such as automobile lubricants. The Town of Truckee aims to reduce storm hydrographs³⁶ and storm water runoff within in the Downtown area through implementation of the Downtown River Revitalization Strategy Plan. Measures within this plan include, but are not limited to, infiltration or retention of runoff and use of filter strips on development parcels adjacent to the Truckee River to slow overland flow of runoff and trap pollutants.³⁷

7. Flooding and Dam Inundation

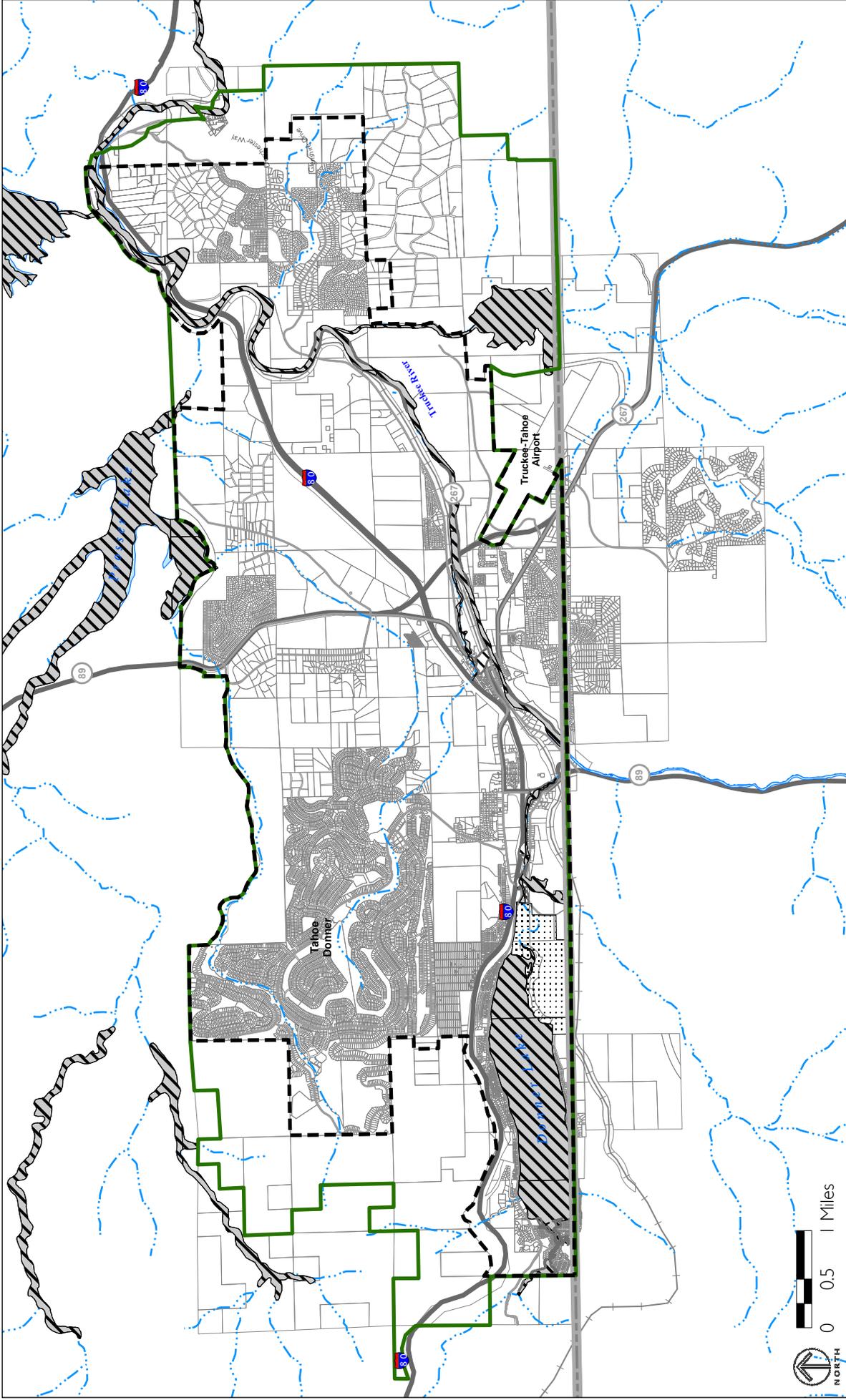
a. Flood Hazard Areas

Flooding is a serious concern in several parts of Truckee, particularly within areas identified as FEMA 100-year flood zones. FEMA produces maps to delineate the 100-year floodplain and regulatory floodway, which are areas that have a one percent chance of being inundated during any particular 12-month period. Figure 4.7-1 identifies flood prone areas within the 100-year floodplain along the banks of the Truckee River, around the Donner Lake shore, along Donner Creek, lower Trout Creek, and Coldstream Creek. 100-year floodplains for other minor streams have been identified for specific projects such as Gray's Crossing. The 100-year floodplain of the Truckee River varies in width and location. In some locations it is contained within the river banks, but in others extensive flooding could extend inland by as much as 300

³⁵ Town of Truckee Municipal Code on the Town of Truckee: <http://www.townoftruckee.com/DCCh030.html>, accessed February 28, 2006.

³⁶ A Hydrograph represents the volume and rate at which water flows past a designated point on a river.

³⁷ Town of Truckee Downtown River Revitalization Strategy, 2005. Town Council Resolution No. 2005-52.



Source: Federal Emergency Management Agency, 1998. Note: This figure includes flood hazard mapping for Nevada County only

FIGURE 4.7-1

FEMA FLOOD HAZARD ZONES

-  Zone A: Subject to 100-Year Flood. Base Elevation Undetermined. Annual probability of flooding of 1% or greater.
-  Zone X500: Area between the limit of the 100-year and 500-year flood; or certain areas subject to 100-year flood with average depths of less than one foot. Annual Probability of Flooding 0.2% to 1%
-  Zone D: Unstudied Area. Flood Hazards Undetermined
-  Zone X: Areas Outside of 500-year floodplain

-  Truckee Town Limits
-  Proposed Sphere of Influence
-  Creek or other Drainage

AREAS SUBJECT TO FLOODING

feet.³⁸ In the event of a storm of greater intensity than the 100-year flood, extensive flooding could extend inland by as much as 300 feet in additional locations.³⁹

The LRWQCB regulations do not allow buildings or parking lots to be constructed within the 100-year floodplain. However, projects necessary for public recreation and projects designed to mitigate sources of erosion may be allowed inclusive of appropriate environmental mitigation for any adverse impacts resulting from such projects.⁴⁰

b. Dam Inundation

There are five dams in the Truckee area. Structural failure at any of these could result in flooding. Detailed information about dam locations and reservoir size is provided in Section A.3, above.

Three dams, located at the Prosser, Boca and Stampede Reservoirs, are located just north of Truckee. A smaller dam is also located at Donner Lake, and another at Martis Creek Lake, south of the Town. While each of these dams has the potential to fail and to release a volume of water that could result in severe short-term flooding, Truckee would not be significantly affected by potential inundation. Based on recent modeling completed by the US Bureau of Reclamation, maximum outflow from a failure of the Prosser, Boca or Stampede dams would back-flow upstream into the Truckee River about two miles from their associated confluences, and would be contained in the main channel of the Truckee River between three to five miles from their sources, depending on which dam provides the source. Failure of the Prosser Dam would result in backflow to about ½-mile downstream of the Truckee sewage plant (about 3.5 miles from Downtown Truckee). It is anticipated that a

³⁸ Town of Truckee Downtown River Revitalization Strategy, 2005. Town Council Resolution No. 2005-52.

³⁹ Town of Truckee General Plan 1995-2014 Volume II, adopted February 15, 1996 by Town Council Resolution No. 96-08.

⁴⁰ Town of Truckee Downtown River Revitalization Strategy, 2005. Town Council Resolution No. 2005-52.

segment of I-80 and the railroad near the confluence of Prosser Creek in the Truckee River Canyon would be inundated by such a failure. Failure of the Stampede Dam or Boca Dam would result in backflow to the confluence of Prosser Creek, about five miles east of Downtown.

8. Seiche, Tsunami, and Mudflows

A seiche is a stationary wave associated with a lake or semi-enclosed body of water usually caused by strong winds and/or changes in barometric pressure. Seiches are similar to the back-and-forth sloshing of water in a tub and can possibly occur in reservoirs, swimming pools and water tanks. The risk of a seiche occurring on Donner Lake during a strong seismic event is considerable given the size of the lake and its location on the southwestern edge of the Town. However, as is discussed in Chapter 4.5, Geology, Soils and Seismicity, there are relatively low levels of seismic activity locally to induce such a seismic event.⁴¹

A tsunami is a very large ocean wave caused by an underwater earthquake or volcanic eruption. Truckee is not at risk from tsunami due to its inland location.

Hillsides and slopes of unconsolidated material could pose a risk of mudflows to the Town of Truckee if these areas become saturated. Usually, this would occur usually as a result of a dual condition of loss of brush cover, and the subsequent accumulation of water on the ground preceded by a period of heavy or sustained rain.⁴² Steep slopes (30 percent or greater), occur in several areas of Town, including some places along the Truckee River; the ridges and hillsides north and west of Downtown; the ridges north of Gateway and north and west of Donner Lake; and areas around Alder Hill. These steep slope areas, particularly where they occur in conjunction with weak soils and

⁴¹ Pacific Municipal Consultants, *Old Greenwood Planned Development Draft Environmental Impact Report (SCH# 2001102077)*, February 2002.

⁴² FEMA National Flood Insurance Management Program <http://www.fema.gov/NFIPKeywords/CFR/44CFR59.1.jsp?msg=59.1+-+Definition>. Accessed May 1, 2006.

vegetation loss, may present a significant hazard in Truckee, although no detailed study has been completed in Nevada County.

B. Standards of Significance

The proposed Truckee 2025 General Plan would have a significant impact if it would:

- ◆ Violate any water quality standards or waste discharge requirements.
- ◆ Substantially alter the existing drainage pattern of the site or area in a manner which would result in substantial erosion or siltation or flooding on- or off-site.
- ◆ Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.
- ◆ Otherwise substantially degrade water quality.
- ◆ Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.
- ◆ Place within a 100-year flood hazard area structures which would impede or redirect flood flows.
- ◆ Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam.
- ◆ Inundate by seiche, tsunami or mudflow.

C. Impact Discussion

This section discusses the potential impacts of the proposed adoption and implementation of the Truckee 2025 General Plan on hydrology, water quality and flooding in the Town of Truckee.

1. Groundwater

Groundwater supply is discussed in Chapter 4.13, Utilities and Service Systems and groundwater quality is discussed below under Water Quality.

2. Water Quality

Water quality can be impacted by the discharge of soils and other pollutants often associated with urban runoff such as oil, grease, pesticides and fertilizers. Grading and construction activity can cause erosion, which can increase the sediment load of runoff. These non-point source pollutants may flow into local surface waters or seep into the groundwater table and incrementally degrade water quality. As development occurs under the Truckee 2025 General Plan, the possibility of additional urban and construction-related runoff would increase.

To minimize the increase of erosion and runoff pollutants, the Town of Truckee Development Code contains specific requirements related to Best Management Practices (BMPs) and other approaches designed to minimize erosion and runoff during construction and operation of new development. Chapter 18.30 of the code regulates drainage and storm water runoff by requiring preparation of drainage and erosion control plans as part of the building permit application process. This process is in accordance with guidelines established by the LRWQCB, and statewide storm water Best Management Practices to avoid negative impacts to water quality.⁴³

In addition, the Town of Truckee Downtown Specific Plan has policies that intend to relocate industrial uses away from the river and protect and im-

prove water quality in the Truckee River and its tributaries. The 2005 Town of Truckee Downtown River Revitalization Strategy also has policies and actions to decrease storm hydrographs and runoff over existing conditions by implementing BMPs for any new development. The Truckee 2025 General Plan further supports these efforts through Goal 10 in the Conservation and Open Space Element, which calls for the creation of a greenway or parkway that extends from Donner Lake, along Donner Creek and the Truckee River, to the eastern Town limit.

The Truckee 2025 General Plan also includes policies and actions to control general erosion and runoff pollution. Conservation and Open Space Element Policy P2.3 states that the Town of Truckee should support all efforts of local community and non-profit organizations to conduct ecological studies of the Truckee River and its associated waterways, undertake water quality monitoring, and perform clean-up and restoration activities. Conservation and Open Space Element Action A2.1 states that the Town should work with the Truckee River Watershed Council, TDRPD and other agencies to develop a comprehensive, long term management plan for the Truckee River corridor within the Town limits. The plan should treat the river and its associated riparian habitat as a holistic system, and should address the complete range of issues associated with the river, including, but not limited to, opportunities for riparian restoration and enhancement, flood protection and water quality improvement. Conservation and Open Space Element Goal 11 states that water quality and quantity in creeks, lakes, natural drainages and groundwater basins should be protected. A number policies and actions under this goal address erosion control and water quality protection in Truckee's waterways, such as P11.1, which requires minimizing excessive paving that negatively impacts groundwater recharge rates; P11.2, which protects surface and groundwater resources from contamination through implementation of Best Management Practices; and P11.5, which requires new development projects that have the potential to impact local water quality through increased storm

⁴³ Town of Truckee Municipal Code:
<http://www.townoftruckee.com/DCCh030.html>, accessed February 28, 2006.

water runoff or erosion to include analysis of water quality impacts as a component of project review, and to integrate mitigation measures that would reduce identified impacts to an acceptable level.

While the Truckee 2025 General Plan would allow new development that could contribute to erosion and additional urban pollutants that may end up in the surface or groundwater systems, implementation of the Town's existing Development Code Standards, The Town of Truckee Downtown Specific Plan, The Downtown River Revitalization Strategy and the policies and actions contained in the 2025 Truckee General Plan would result in a *less-than-significant impact* to water quality.

3. Drainage and Storm Water Disposal

Additional development and related construction allowed by the Truckee 2025 General Plan could affect the drainage system in the Truckee area by increasing storm water, which could require additional storm water drainage facilities. The alteration of drainage patterns could also result in substantial erosion, siltation or flooding on- or off-site. However, policies and regulations contained in the Town of Truckee Development Code and the 2025 General Plan would serve to address adequate provision of drainage infrastructure. Requirements for new or upgraded facilities will be determined largely by the scale of a specific project and its demand on existing storm water drainage infrastructure.

The 2025 General Plan Safety Element Policy P2.3 requires that storm water drainage systems be incorporated into development projects to effectively control the rate and amount of runoff, so as to prevent increases in downstream flooding potential. Policy P4.2 in the Land Use Element states that the Town should cooperate with special districts to plan for and identify suitable future sites for needed facilities, including utilities infrastructure, so that the local population can be safely and efficiently served, while also minimizing potential environmental impacts. Policy P4.3 establishes standards for the provision and timing of new infrastructure. As mentioned previously in the regulatory section of this chapter, the Town of Truckee's Building Division

requires an erosion protection plan for all new building construction and grading activity within the Town limits. Erosion protection plans must depict erosion protection measures to be installed on disturbed areas so as to prevent sediment from being mobilized and transported into nearby water-courses.⁴⁴

Implementation of the Truckee 2025 General Plan policies and actions, in concert with the Town's other development standards and requirements would reduce the potential for impacts associated with drainage system changes and increased runoff to a *less-than-significant* level.

4. Flooding

Flooding is a serious concern in several parts of Truckee, particularly within those areas within FEMA 100-year flood zones, which are along the banks of the Truckee River, around the Donner Lake shore, along Donner Creek, lower Trout Creek, and Coldstream Creek. To minimize the risk of flooding, the Town of Truckee Development Code contains specific requirements within Article III, Chapter 18.34, that strictly regulate development within all FEMA or FIA identified flood hazard areas. The Town participates in the FEMA-run National Flood Insurance Program, which involves implementing land use, zoning and building regulations to minimize local flooding risk. As residents of a participating community, Truckee property-owners and renters are entitled to purchase flood insurance at reduced cost through the federally-sponsored program.

The Truckee 2025 General Plan has several policies and actions that address the reduction of flood hazards in the Truckee area. Safety Element Policy P2.1 states that the Town of Truckee should continue to work with appropriate local, State and federal agencies (particularly FEMA) to maintain the most current flood hazard and floodplain information and use it as a basis for project review and to guide development in accordance with federal, State and

⁴⁴ Town of Truckee: <http://www.townoftruckee.com/DCCh030.html>, accessed February 28th, 2006.

local standards. Policy P2.2 states that the Town of Truckee should continue to participate in the National Flood Insurance Program (NFIP). Finally, policy P2.4 discourages development within the Truckee River floodplain and adjacent to other waterways to minimize risks associated with flooding. Conservation and Open Space Element Policy P2.1 prohibits development within established setback areas from the Truckee River and other blueline streams, except as otherwise allowed in the Development Code. Outside of the Downtown Specific Plan Area, development would be required to be set back a minimum of 100 feet from the edge of the Truckee River's 100-year floodplain. Within the Downtown Specific Plan Area, development would be required to be set back a minimum distance from the edge of the 100-year floodplain that is equivalent to one foot above the base flood elevation.

Given existing provisions by the Town of Truckee and implementation of the Truckee 2025 General Plan policies and actions, the potential for impacts associated with flooding are reduced to a *less-than-significant* level.

5. Dam Inundation Risk

There are five dams in the Truckee area. Detailed information about dam locations and reservoir size is provided in section A.3, above. Structural failure at any of these could result in flooding. While each dam has the potential to fail and to release a volume of water that could result in severe short-term flooding, Truckee would not be significantly affected by potential inundation and therefore, release of water from them poses minimal risk.

Given existing provisions by the Town of Truckee and implementation of the Truckee 2025 General Plan policies and actions, the potential for impacts associated with dam inundation are reduced to a *less-than-significant* level.

6. Seiche, Tsunami or Mudflow Hazards

As mentioned previously, the potential risk of seiche is low in the Town of Truckee due to the relatively low levels of seismic activity locally. The Town of Truckee area is not at risk of tsunamis due to its inland location. The area is at risk of mudflows due to its topography and proximity to hillsides. The

Truckee 2025 General Plan has several policies and actions addressing development in areas of steep slopes and unstable soils. Policy P1.1 in the Safety Element states that new residential development should be grouped and located in such a way as to avoid areas of hazard including steep slopes and areas of unstable soils. Policy P1.3 requires soils reports for new development in areas where geologic risks are known to exist. Such reports should include recommendations for appropriate engineering and other measures to address identified risks. Finally, Safety Element Action A1.1 amends the Development Code to include reference to cliff edges and escarpments in standards and guidelines concerning steep slopes, ridges and hillsides. As a result, adoption and implementation of the Truckee 2025 General Plan would result in *less-than-significant* impacts related to seiches, tsunamis and mudflows.

D. Cumulative Impacts

As development proceeds within the Truckee River and Upper Truckee River watershed areas, impervious surfaces will increase – as will the amount of pollutants in runoff – thereby impacting surface and groundwater quality. Additional population would also be exposed to the risk of flooding. However, cumulative water quality impacts in Truckee and in Placer and Nevada Counties would be reduced by implementing Best Management Practices in accordance with the NDPES program; implementation of the water quality policies contained in the 2025 General Plan would further reduce Truckee’s contribution to cumulative water quality impacts. With the 2025 General Plan policies and actions in place and continued compliance with the NPDES and other RWQCB regulations in the region, there would be no cumulative water quality impacts from the 2025 General Plan projects and other projects in the region.

The proposed General Plan would not alter waterways and Policies P.4 through P.7 in the General Plan Safety Element would mitigate potential impacts in flood prone areas to *less-than-significant* levels. Given that less than significant impacts on hydrology and water quality are expected from imple-

mentation of the Truckee 2025 General Plan, the Plan would not contribute to any cumulative impacts.

E. Impacts and Mitigation Measures

Since the adoption and implementation of the Truckee 2025 General Plan results in *less than significant impacts* to hydrology and water quality in and around the Town of Truckee, no mitigation measures are required.

TOWN OF TRUCKEE
2025 GENERAL PLAN EIR
HYDROLOGY AND WATER QUALITY