WILL A TMDL REVIEW REQUIRE THE WATER QUALITY STANDARDS TO BE REVISITED?

A TMDL must demonstrate that it is possible to reach WQS that are established for the water body. If the original standard is need of improvement, it must be revisited and modified before development of the TMDL. While NDEP supports the ongoing Truckee River Third Party TMDL review, the Agency desires that the Truckee River WQS first be reviewed to ensure that appropriate TMDL targets exist. In fact, NDEP has included the Truckee River on its list of priority waters for which WQS should be reviewed and potentially revised as part of the triennial review process (NDEP, 2011.

Site-Specific Criteria:

Water quality standards are often developed for large reaches of streams, or for many streams under the assumption that similar conditions exist everywhere the standard is applied. In some cases local conditions may be different from this assumption. Models and data can be used to demonstrate to the State that a revised numeric criteria (i.e., different constituent concentration) will not have adverse effects on designated uses. The revision of WQS to establish site-specific criteria is intended to result in WQS that protect local uses and are not overly stringent.

The TN and TP site-specific criteria for the Truckee River were developed to help control the potential growth of algae which could in turn result in reduced dissolved oxygen concentrations. The development of the technical rationale for any proposed changes to nutrient site-specific criteria will focus on the use of water quality models to provide the linkage between nutrient loading to the Truckee River and resulting dissolved oxygen levels. The models simulate the complex relationship of how various levels of nutrient concentrations, in combination with other factors such as temperature and light, can lead to excessive growth of algae and ultimately a situation of depleted dissolved oxygen. The models will help ensure that any proposed nutrient water quality standards reflect the site-specific response of the Truckee River to nutrient loads and provide enough protection while not being overly restrictive.

Nevada's Continuing Planning Process (NDEP, 2007) outlines the water quality standards adoption process. Any review and revision to Truckee River nutrient WQS will follow this process. The State Environmental Commission (SEC) has the authority to adopt and amend water quality standards. The adoption process involves the submittal of a WQS revision proposal to the SEC which then acts upon the proposal in a public hearing. Prior to the public hearing, a public participation process must occur.

FOR MORE INFORMATION:

NDEP Water Quality Standards: http://ndep.nv.gov/bwqp/stdsw.htm page

NDEP, 2006. NDEP Bureau of WQ Planning's 5 year plan: July 2006-June 2011 http://ndep.nv.gov/bwqp/file/5-year_plan-2006-2011.pdf

NDEP, 2007. Nevada's Continuing Planning Process, Nevada Division of Environmental Protection, Bureau of Water Quality Planning, January, 2007. http://ndep.nv.gov/bwqp/file/final_cpp_07.pdf

NDEP, 2011. Nevada Division of Environmental Protection Bureau of Water Quality Planning. Triennial Water Quality Standards Review 2011 Public Comment Period and Workshops http://ndep.nv.gov/bwqp/file/TR_CommentResponseBinder.pdf

PLPT Water Quality Control Plan: http://www.plpt.nsn.us/environmental/water.htm

Pahl, R. 2010. History of Nutrient Water Quality Standards on the Truckee River, prepared by Randy Pahl, Nevada Division of Environmental Protection, December 2010.

Truckee River Info Gateway (TRIG). URL: http://www.truckeeriverinfo.org/

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Truckee River Fact Sheet

Water Quality Standards for the Truckee River

Water quality standards are the foundation of the water quality-based control program mandated by the Clean Water Act (CWA). Water quality standards (WQS) help protect and restore the quality of surface waters by defining the goals for a water body, designating its uses, setting criteria to protect those uses, and establishing provisions to protect water quality from pollutants. WQS also support other efforts to maintain and improve water quality conditions such as Total Maximum Daily Loads (TMDLs), permitting of wastewater discharges, and water quality management planning.

WHAT IS A WATER QUALITY STANDARD?

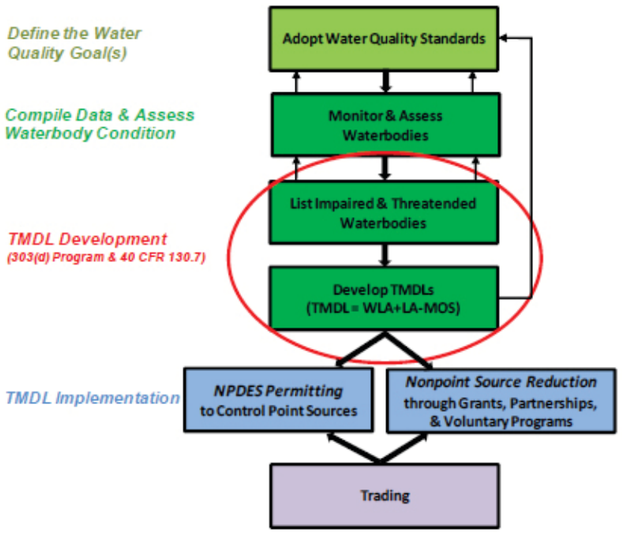
A WQS is comprised of three components. The first component of a WQS, the designated (or beneficial) use, considers the value of the water body for uses such as public water supply, fish protection, recreation, agriculture, industry, and navigation. A particular waterbody may have multiple designated uses.

Water quality criteria are a second component of a WQS which are established to protect each designated use. Designated uses such as recreation typically have water quality criteria for bacteria that protect human health. An aquatic life designated use may be supported by criteria for temperature or dissolved oxygen. Criteria may be expressed numerically (as pollutant concentrations) or as narrative requirements (qualitative statements that establish water quality goals). For each pollutant, criteria are established with the intent to protect the most restrictive designated use. It is assumed that all other designated uses will be protected if criteria are met for the most stringent designated use.

Antidegradation is a third component of a WQS designed to ensure that once an existing use is reached, no actions will be allowed that would degrade that use.

The CWA requires that each state and tribe in the United States develop WQS, and before taking effect, they must be approved by the USEPA. States and tribes are required to review their WQS at least every three years (called a triennial review), and revise them if appropriate. Revision to WQS may be justified if water quality conditions or water body uses have changed or if new scientific information is available. The WQS revision process involves public participation. The Nevada Division of Environmental Protection (NDEP) WQS, first established in the early 1980s, have undergone several revisions, and are only applicable to waters within the State of Nevada. The Pyramid Lake Paiute Tribe's (PLPT) WQS were approved by USEPA on December 19, 2008 and apply within tribal boundaries.

The Clean Water Act also requires that WQS be defined to keep water quality at a level that meets all downstream standards. For the Truckee River, all WQS established in Nevada must provide for the attainment and maintenance of the downstream standards established by PLPT.



Schematic of the Water Quality Based Approach to the Clean Water Act

HOW ARE WATER QUALITY STANDARDS AND TMDLS RELATED?

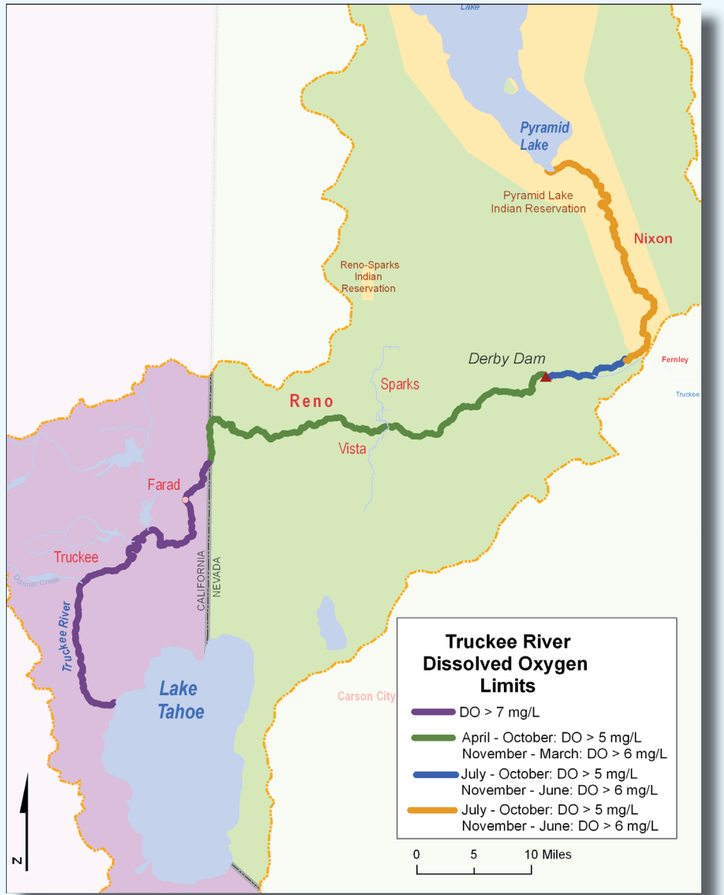
Adoption of appropriate WQS is the first step of the water quality-based approach mandated by the CWA (see figure above). This step allows states to set goals for restoring and protecting waters. If monitoring data show that a WQS is violated, the waterbody is placed on the 303(d) list (a database of impaired water bodies) and a TMDL may be developed. The TMDL will determine the allowable pollutant load the water body can receive and still be capable of meeting the WQS.

WHICH WATER QUALITY STANDARDS ARE IMPORTANT FOR THE TMDL REVIEW?

The 1994 TMDLs were developed to address a dissolved oxygen deficiency in the Truckee River and to fulfill antidegradation requirements for total dissolved solids (TDS). It established acceptable loading limits of nutrients (total nitrogen and total phosphorus) and TDS that would allow for the dissolved oxygen, total nitrogen, total phosphorus, and TDS WQS to be met for the Truckee River.

Nutrients (such as nitrogen and phosphorus) by themselves do not cause water quality problems within the Truckee River, but nutrient levels can contribute to algae growth and lead to low dissolved oxygen (DO) conditions. The total nitrogen (TN) and total phosphorus (TP) WQS were developed to help control the potential growth of algae. Both temperature and DO water quality criteria have been set to protect the same designated use: aquatic life. Increased water temperatures can also lead to decreases in DO. A temperature TMDL has not yet been developed for the Truckee River.

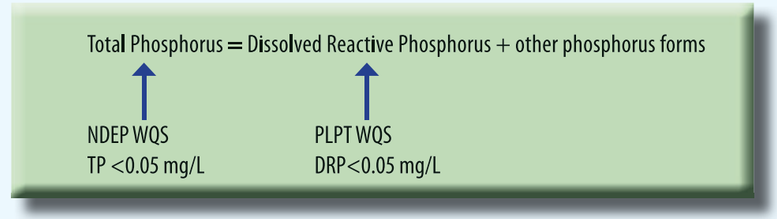
The proposed TMDL review will focus primarily on DO and nutrients; therefore, only TN, TP, and DO standards are discussed in this fact sheet.



Dissolved Oxygen Dissolved oxygen is a measure of oxygen dissolved in water and is an important indicator of a water body's ability to support aquatic life. The State of California has set a criterion of dissolved oxygen greater than 7 mg/L for the upper portion of the Truckee River. Both the NDEP and PLPT DO criteria require that dissolved oxygen must be greater than 6 mg/L from November through June, and greater than 5 mg/L from July through October for the portion of the Truckee River downstream of Derby Dam. Upstream of Derby Dam, the NDEP DO criteria require that dissolved oxygen must be greater than 6 mg/L from November through March and greater than 5 mg/L from April through October. The dissolved oxygen standard is more restrictive downstream of Derby Dam from April through June to provide a higher level of protection for Cui-ui and Lahontan cutthroat trout egg incubation and fry. There are no segments of the Truckee River identified as impaired for dissolved oxygen on Nevada's 2006 303(d) list.

Total Nitrogen The total nitrogen WQS for the Truckee River includes both annual average and single value concentration site-specific criteria. As documented by NDEP, the current TN WQS for the Truckee River below East McCarran Blvd. was established in 1984 (Pahl, 2010). Both the annual average criterion of 0.75 mg/L (as N) and single value criterion of 1.2 mg/L are consistent with criteria established in 1980. Records suggest that these criteria were set to protect beneficial uses, yet were based upon observed local water quality that existed at that time. Little documentation has been found to explain the source of these criteria (Pahl, 1020). The PLPT total nitrogen criteria were established to match existing NDEP criteria (PLPT, 2008). Currently, all segments of the Truckee River meet the total nitrogen numeric limit.

Phosphorus Phosphorus typically exists in natural waters as living and dead plankton, precipitates of phosphorus, phosphorus adsorbed to particulates, and dissolved inorganic and organic phosphorus. For different regions of the Truckee River, phosphorus WQS are established as either annual average total phosphorus (TP) or dissolved reactive phosphorus (DRP), which is essentially equivalent to orthophosphate.



In 1984, NDEP established an annual average TP criterion of 0.05 mg/L (as P) for the Truckee River below East McCarran Blvd. The origin of the criterion is not well documented but it corresponds to a 1980 criterion of 0.15 mg/L (as PO4). The numeric difference between the two standards is due to a unit conversion (Pahl, 2010). NDEP also established TP and orthophosphate criteria for the Truckee River upstream from East McCarran Blvd. in 1984. An annual average TP criterion of 0.1 mg/L (as P) was set based upon USEPA's 1976 Red Book and a single value orthophosphate criterion of 0.05 mg/L (as P) was set based upon "best available" site specific information.

For the Truckee River from the PLPT boundary down to Pyramid Lake, the annual average concentration of DRP must not exceed 0.05 mg/L. PLPT established a DRP standard rather than a total phosphorus standard recognizing that phosphorus is a nutrient of secondary importance in regulating algal growth (the Truckee River is nitrogen-limited), and that DRP is the bioavailable fraction of total phosphorus (PLPT, 2008). Because DRP is only one type of phosphorus that makes up TP, the NDEP TP criterion is more stringent than the PLPT DRP criterion.

Nevada's 2006 303(d) Impaired Waters List indicates that three reaches of the Truckee River from East McCarran Blvd. to Wadsworth have been delisted for TP impairment because there is an USEPA approved TMDL; however, it is noted that, periodically, the phosphorus concentration in the river "does not meet water quality standards". Although exceedances of nutrient WQS are noted in recent years, the most recent NDEP 303(d) list (2006) indicates no impairment for DO along the entire length of the Truckee River within the State of Nevada. Currently, the PLPT does not have a 303(d) list to define whether or not the Truckee River is impaired for DO, TN, or DRP within the tribal boundaries.

As compared to many states, Nevada and the PLPT are unique because of the large number of site-specific criteria that already exist. NDEP notes that USEPA has issued extensive technical guidance, such as ecoregion criteria, to assist states and tribes in developing regionally-based numeric nutrient criteria. However, the appropriateness of these criteria for the Truckee River may be questionable and a site-specific analysis could be more appropriate (Pahl, 2010).

TRUCKEE RIVER NUTRIENT WATER QUALITY STANDARDS