

# Northern Nevada Water Planning Commission

## STAFF REPORT

**DATE:** September 29, 2016  
**TO:** Chairman and Members, Northern Nevada Water Planning Commission (“NNWPC”)  
**FROM:** Jim Smitherman, NNWPC Water Resources Program Manager  
**SUBJECT:** Presentation of comments received on the “Wastewater and Watershed-Based Water Quality Planning” chapter for the 2016 Regional Water Management Plan ("RWMP") update; discussion and possible direction to staff.

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### SUMMARY

Since the last presentation of this chapter to the NNWPC at the August 3, 2016 meeting, staff has incorporated comments concerning Sections:

4.6.2 Truckee River Total Maximum Daily Loads; and  
4.6.12 Public Outreach Programs.

Recommended revisions resulting from comments received are shown as redlined edits. Staff is requesting any additional comments for these sections from the Commission.

### RECOMMENDATION

Staff recommends that the NNWPC accept the report on comments received and proposed revisions to the “Wastewater and Watershed-Based Water Quality Planning” chapter for the 2016 RWMP update, and, if acceptable, approve the changes and provide direction to staff as appropriate.

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Attachment: Section 4.6.1, Section 4.6.12



## **Chapter 4 – Wastewater and Watershed-Based Water Quality Planning**

### ***4.6 Watershed Management Programs to Protect the Availability and Quality of Water Resources***

The Truckee River, critical to the local economy and quality of life, is a shared resource in the Truckee Meadows and among upstream and downstream users. Effective watershed protection requires cooperation among two states, one sovereign Indian nation, multiple counties, cities, towns, various utilities, other entities and the public.

Watershed Management is an integrated approach to protecting water resources. The watershed approach coordinates environmental management within geographic boundaries to focus public and private stakeholders on the highest priority water quality problems. The objective of watershed protection is to develop management strategies that allow demands on water resources to be met while protecting beneficial uses throughout the watershed. The watershed approach brings together stakeholders most affected by management decisions, facilitates sharing of data and other technical resources, and encourages consensus building. Stakeholders may use an iterative process to identify and assess problems, prioritize, set environmental objectives, and develop management options and action plans. The watershed approach allows water resource specialists within the Truckee River watershed to develop creative solutions to issues that extend downstream and upstream across political jurisdictions, implement watershed management plans, and evaluate effectiveness.

#### ***4.6.1 Regulatory Considerations***

##### ***Clean Water Act***

In 1972, Congress passed the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (“CWA”). The CWA’s objective was to “restore and maintain the chemical, physical, and biological integrity of the nation’s waters” and its main goals included: 1) “that the discharge of pollutants into the navigable waters be eliminated by 1985”, and 2) “that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983”.

##### ***NPDES Permit Program***

One of the first steps taken by the EPA to implement the CWA was the creation of the **National Pollutant Discharge Elimination System (“NPDES”)** program, which controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The CWA defines “point source” as “any discernible, confined, and discrete conveyance including but is not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft from which pollutants are or may be discharged” (CWA Section 502[14]). Industrial, municipal, and other facilities must obtain NPDES permits if their discharges go directly to surface waters.

Unlike pollution from industrial facilities and municipal sewage treatment plants, non-point source pollution comes from many diffuse sources and is caused by rainfall or snowmelt moving

over and through the ground picking up and carrying natural and human-made pollutants to lakes, rivers, other water bodies and groundwater.

Although the NPDES program succeeded in controlling many significant municipal and industrial point sources of pollution, studies conducted by the EPA and others in the 1980s identified storm water runoff from urbanized areas (i.e. non-point source pollution) as a leading cause of impairment to the nation's water bodies. Additionally, EPA reported in the early 1990s that nearly 40 percent of surveyed waters in the United States remained too polluted for fishing, swimming and other uses, and pollutants such as silt, fertilizer, metals, oil and grease were among the leading causes.

During this time, the EPA developed the *Watershed Protection Approach Framework* (published in 1991) as one strategy to address these issues. In addition, amendments to the CWA resulted in EPA requirements for NPDES permit coverage for storm water discharges from medium and large municipal separate storm sewer systems beginning in 1990. This addition to the NPDES program essentially shifted municipal storm water discharges from non-point source status to regulation as a point source. This is an example of the progressive nature of the NPDES program whereby over the years more sources have been included under the definition of point source pollution. The local NPDES storm water program is described in Section 4.6.4.

### ***Water Quality Standards***

The CWA also requires specific water quality standards (“WQS”) to be set based on the intended use of the water, i.e. “beneficial uses”. These include water quality for aquatic life propagation, recreational, agricultural, industrial, municipal and many other uses. Specific ~~WQSwater quality standards~~ are set by states, territories, and authorized tribes, which associate the beneficial uses for each water body with scientific criteria to support those uses. States cannot set standards that allow higher concentrations of pollutants than EPA standards; they can be more restrictive, but not less. ~~Water quality standards~~QS for Nevada are contained in [NAC 445A.118-225](#).

### ***Section 303(d) List of Impaired Waters***

Section 303(d) of the CWA requires that each state develop a list of water bodies that need additional work beyond existing controls to achieve or maintain ~~WQSwater quality standards~~, and submit an updated list to EPA every two years. -The law requires that states establish priority rankings for waters on “303(d) lists” and develop total maximum daily loads (“TMDLs”) for these waters if they meet criteria.

The Nevada 2012 Water Quality Integrated Report (“Integrated Report”) provides a comprehensive inventory of water bodies throughout the state, including a list of impaired waters now identified as Class 5 (previously labeled 303(d) waters). Impairments may be of all types and sources, and form the basis for targeting water bodies for watershed-based solutions. Nevada's most recent Integrated Report with its list of impaired waters was approved by the EPA in 2014 and can be obtained online at: [http://ndep.nv.gov/bwqp/file/IR2012\\_Report\\_Final.pdf](http://ndep.nv.gov/bwqp/file/IR2012_Report_Final.pdf).

### ***Total Maximum Daily Load***

The additional work that may be necessary beyond existing controls for listed water bodies includes the establishment of one or more TMDLs. A TMDL is a calculation of the maximum amount of a pollutant that a water body can receive **from all sources** and still meet water quality standards. The TMDL process provides an analytical framework to identify the sources and causes of pollution, identify the relative contributions of each pollutant and establish allocations for each specific pollutant as needed to attain water quality standards. The calculation must include a margin of safety to ensure that the water body can be used for the purposes the state has designated. The calculation must also account for seasonal variation in water quality. The point source portion of a TMDL is called a wasteload allocation (“WLA”) and the non-point source portion, including background sources is called a load allocation (“LA”).

#### ***4.6.2 Truckee River Total Maximum Daily Loads***

##### ***Background on Truckee River Nutrient WQS and TMDLs***

TMDLs have been established for the Truckee River within the State for three constituents, TN, TP, and total dissolved solids (“TDS”). TMDLs are measured at Lockwood under the assumption that if the TMDLs are being met at this location, downstream from TMWRF, they are being met on the rest of the “impaired” river reach.

The Truckee River downstream of the Truckee Meadows historically has been challenged with difficulty meeting aquatic life uses under existing water quality standards and TMDLs. In the 1980s, water quality sampling indicated that the Truckee River was impaired for low dissolved oxygen (“DO”). An overabundance of benthic algae was determined to be the primary cause of low DO. Benthic algae, also called periphyton, thrive in conditions with ample bioavailable nutrients (nitrogen and phosphorus) and shallow water depth (allowing for light penetration to the bottom) and increased opportunity for photosynthesis. Primary sources of nutrients to the Truckee River include natural background sources, nonpoint sources (e.g., stormwater, irrigation return flows, septic systems), and point source discharges. The largest point source in the watershed is the Truckee Meadows Water Reclamation Facility (“TMWRF”) that serves the cities of Reno and Sparks and portions of Washoe County. Total nitrogen (TN) and total phosphorus (TP) water quality criteria for the Truckee River were developed by the Nevada Division of Environmental Protection (NDEP) in the 1970s and have been refined over time, with the current standards set in 1984. In 1994, NDEP established TMDLs for TN and TP in the Truckee River (NDEP, 1993). The 1994 Truckee River TMDL resulted in a TN allocation of 1000 lb/day, with half of the load (500 lb/day WLA) allocated to TMWRF and the bulk of the remainder, the LA, to nonpoint sources. The TMDL also specifies a TP allocation of 214 lb/day, with 134 lb/day allocated to TMWRF and the remainder, the LA, to nonpoint sources. ~~TMDLs have been established on the lower Truckee River for three constituents, TN, TP, and total dissolved solids (“TDS”). TMDLs are measured at Lockwood under the assumption that if the TMDLs are being met at this location, downstream from TMWRF, they are being met on the rest of the “impaired” river reach. These are by no means the only pollutants in the water at Lockwood; however, they are the pollutants identified as causing water quality impairment and low dissolved oxygen levels. TMDLs are established for pollutants that exceed water quality standards 10 percent or more of the time for a five year period.~~

~~WLAs have been determined for each identified pollutant at each point source. For example, there are allocations for TMWRF, Vista Canyon, and the Sparks Marina Park, which all discharge to the Truckee River. The TMDLs are summarized in Table 4-2. Each entity must comply with its NPDES permit requirements, including discharge limitations designed to meet~~

the WLAs. ~~LAs have also been determined for background and non-point sources. The TMDLs are summarized in Table 4-2.~~

~~With the exception of TDS, the Truckee River was generally listed as impaired from the reach immediately downstream of Lockwood and continuing downstream to Pyramid Lake. TDS was only shown to impair the river between the east McCarran Bridge and Lockwood, downstream.~~

~~In 1994, the state completed three separate TMDLs for TP, TN, and TDS respectively (see Table 4-2). The TN TMDL was set to minimize dissolved oxygen (“DO”) violations for the 1988 low flow year. Both the TP and TDS TMDL were set based on average annual flow conditions. TP and TN were addressed in TMDLs due to the relation between nutrient loads, algal breakouts, and the resulting depletion of DO. Once a constituent is addressed in a TMDL, it can be taken off the 303(d) list; therefore, TN, TP and TDS were removed in 1994.~~

### ***Third Party TMDL Review***

~~Include reference: LimnoTech (2016) Reno, Sparks, Washoe County and the Truckee Meadows Water Authority (“TMWA”) began leading a third-party effort to review the Truckee River TN and TP TMDLs starting in the mid-2000s (LimnoTech, 2005). Several factors motivated the TMDL review. Although TMWRF is currently able to comply with the WLA designated by the 1994 TMDL, the ability of TMWRF to meet the TN WLA and serve future growth of the service area was thought in the early 2000s to require very costly advanced treatment technologies. In addition to regional growth, other driving factors to TMDL revision included improved river flow operations, advances in understanding the science of river processes, and a desire for more flexible solutions to water quality management. During the years since the 1994 TMDL was approved, new data were collected, new modeling tools were developed, and operation of the Truckee River dams and diversions had changed. The additional data and enhanced modeling tools have improved the understanding of how the river assimilates (i.e., takes up or absorbs) nutrients, and how improved river flows may result in a higher assimilative capacity for nutrients.~~

~~NDEP and USEPA agreed that a third-party review of the 1994 TMDL is appropriate to determine whether the assumptions underlying the 1994 TMDL remained valid, and to identify new scientific and technical information and/or changes in conditions and river operations that may warrant a different approach to addressing nutrient issues in the watershed. NDEP has the authority to adopt, modify or reject a third-party TMDL based on a variety of factors. USEPA approval of TMDLs is required.~~

~~A Truckee River WQS/TMDL Working Group (“Working Group”) was formed and included representatives from Reno (third-party), Sparks (third-party), Washoe County (third-party), TMWA (third-party), Western Regional Water Commission (“WRWC”), NDEP, USEPA Region 9, LimnoTech (consultant) and Stantec (consultant). In 2011, the third-parties, NDEP and EPA jointly developed and finalized a TMDL/WQS Review Work Plan to describe a process for the review including roles, responsibilities and expectations. In consultation with NDEP and USEPA, the third-parties agreed to facilitate public outreach and obtain input from affected stakeholders at key decision points in the review and revision process.~~

~~An effort has been underway among Reno, Sparks, Washoe County and TMWA, in collaboration with NDEP and EPA, to conduct a Third Party review of the 1994 nutrient TMDL and applicable water quality standards. The parties believed the effort was appropriate for the following reasons:~~

- ~~Scientists and engineers now have a better understanding of river processes and there have been significant advancements in available software and the predictive capabilities of watershed and water quality models.~~
- ~~Significantly more data exists than were available during the development of the 1994 TMDL. Since 1990, there has been an increase in cooperative data collection on the Truckee River through the Coordinated Monitoring Program, the TRIG web data portal and other efforts.~~
- ~~The combination of extensive data and improved computer modeling tools has greatly increased the general understanding of the Truckee River and related watershed processes and has increased the ability to better simulate the river and watershed with computer models.~~
- ~~The water quality standard for TP was established using a national guideline, rather than a site-specific approach. With advancement in the understanding of Truckee River functions and processes, a site-specific standard may be developed that is protective of the river and its beneficial uses without being overly restrictive.~~
- ~~The hydrologic conditions used in the 1994 TMDL were based on 1988 river operations that deviated significantly from typical operations. 1988 conditions will not be applicable after the implementation of TROA.~~
- ~~Low flow projections for a revised TMDL should reflect current and probable future low flow conditions and regulatory requirements as defined by TROA implementation.~~
- ~~Determination of the requirements for discharges to the Truckee River will allow long-range wastewater infrastructure planning to be conducted properly.~~
- ~~The 1994 TMDL was not flexible enough to consider restoration and potential future benefits which could result due to changes in the physical conditions of the Truckee River system.~~

#### ***4.6.2 Truckee River Water Quality Modeling for Water Quality***

The third-parties, with funding from the WRWC, retained the services of the consulting firm LimnoTech to conduct the majority of the technical work related to the TMDL review. The foundation of the technical work is the development and application of a set of watershed and river water quality models that provide linkage between nutrient levels in the Truckee River and resulting DO levels:

- Watershed Analysis Risk Management Framework (“WARMF”) – watershed model
- Hydrological Simulation Program FORTRAN (“HSPF”) – river water quality model

The combination of extensive data and improved computer tools had greatly increased the general understanding of the Truckee River and related watershed processes as well as improved the ability to better simulate the river and watershed under contemporary conditions. The two linked models were run together to provide an understanding of how the Truckee River system assimilates nutrients and complies with DO criteria under a representative flow condition. The models simulated the complex relationship of how nitrogen and phosphorus, in combination with other factors such as temperature and light, can lead to excessive growth of algae and ultimately a situation of depleted DO. The following sections provide a brief summary of both models.

Truckee River Hydrological Simulation Program FORTRAN (“TRHSPF”) is an in-stream water quality model used to predict occurrences of low ~~dissolved-oxygen~~DO resulting from benthic algae, low flow, and other pollutants. It incorporates peer-reviewed empirical and theoretical equations related to the growth, death, nutrient preferences and removal of benthic algae based on the DSSAMt model, which is a variation of the DSAMM III model used for the 1994 Truckee River nutrient TMDL.- TRHSPF inputs include projected point source flows and diversions as generated by a water operations model, and tributary flows and non-point source loads from a watershed model.

The Truckee River Operations Model (“TROM”) is a water operations model that projects regulatory flows (reservoir releases, diversions) with and without different flow management strategies (e.g., TROA) in place. The model accounts for future municipal and industrial (“M&I”) demands, and conversion of water rights from agricultural use to M&I. TROM was used to support the TROA Environmental Impact Statement/Environmental Impact Review (“EIS/EIR”) analysis released in 2008. TROM output, available for a 100-year period, is used for input to the watershed and water quality models to define conditions with and without flow management in place.

Watershed Analysis Risk Management Framework (“WARMF”) is a watershed model adapted to the Truckee River basin that ~~predictsforecasts~~ non-point source loads under current and future land use as well as projects potential non-point load reductions. WARMF inputs include meteorology, land use, as well as managed flows provided by TROM (e.g., reservoir releases, municipal and agricultural diversions). WARMF calculates the distinction between storm water and non-storm water non-point sources and also simulates potential improvements and reductions of non-point source loads from best management practices (“BMPs”), conversion of

**Table 4-2 Summary of Truckee River Total Maximum Daily Loads, Waste Load Allocations and Load Allocations**

Source	Nitrogen	Phosphorus	TDS
Load Allocation			
Non-Point Sources/Background	450 lbs/day	75.25 lbs/day	None assigned
Waste Load Allocation			
TMWRF	500 lbs/day (annual average) 500 lbs/day (30 day average, May–Oct.)	134 lbs/day	120,168 lbs/day
Vista Canyon Group	16.7 lbs/day	4.75 lbs/day	9,730 lbs/day
Sparks Marina Lake	33.3 lbs/day	WLA Trade Agreement	19,390 lbs/day
Total Maximum Daily Load			
TMDL	1,000 lbs/day	214 lbs/day	900,528 lbs/day

agricultural lands, and removal of septic systems.

Tributary flows and non-point source loads predicted by WARMF are linked to the in-stream water quality model, TRHSPF. TRHSPF calculates in-stream temperature and constituent concentrations (e.g., nutrients, DO), and has the capability to assess potential nutrient assimilative capacity benefits due to deeper water and cooler temperatures realized through stream restoration. The three linked models, run together under various flow management scenarios, provide an understanding of how the Truckee River system assimilates nutrients and complies with ~~water quality standards~~WQS. These modeling runs and improved descriptions of riverine conditions are provided on the Truckee River Info Gateway (documents for the runs may be found at [www.truckeeriverinfo.org/tmdl](http://www.truckeeriverinfo.org/tmdl)) including The Final Truckee River Water Quality Standards Rationale report by LimnoTech (2014).

### ***Nevada Nutrient WQS Review***

During the course of the nutrient TMDL review and revision, two important efforts were conducted to review and revise nutrient WQS for the Truckee River. The third-parties supported NDEP's triennial review and Pyramid Lake Paiute Tribe ("PLPT") conducted an independent triennial review of nutrient WQS.

NDEP and USEPA agreed to consider any third-party proposed revisions to the existing nutrient WQS in an effort to assure that the WQS are appropriate and that any TMDL revision would be based on the best available WQS. The existing nutrient water quality criteria were based on limited information such as algal growth studies conducted in the late 1970's (before TMWRF upgrades) and USEPA's "Red Book" (USEPA, 1976). NDEP had recognized that these criteria were in need of improvement.

In 2011, NDEP issued notice of its intent to conduct a triennial review of WQS and requested comments to consider for potential revisions. Reno, Sparks, and Washoe County each requested a review and potential revision of the TP and TN WQS for the Truckee River. The third-party led effort that followed, sponsored by WRWC, provided scientific support in the reassessment of WQS.

An important element of the WQS review process was engagement with watershed stakeholders in order to fully vet the interests, concerns, and potential impacts of any changes to WQS or TMDLs. Key watershed stakeholders were engaged on an individual basis, followed by the formation of a Truckee River WQS Focus Group ("Focus Group") and a series of workshops. In addition to members of the Working Group, the Focus Group included representatives from Churchill County, City of Fernley, Pyramid Lake Paiute Tribe, Truckee Carson Irrigation District ("TCID"), U.S. Fish and Wildlife Service, and Nevada Department of Wildlife ("NDOW"). All Focus Group members were encouraged to provide comments throughout the process via both written feedback forms and opportunities for verbal comments during the workshops.

### ***Technical Approach and Results***

The foundation of the technical work involved application of the linked and calibrated WARMF-TRHSPF models to evaluate potential nitrogen and phosphorus water quality criteria. A full description of the technical activities was documented by LimnoTech, (2014) and a summary of results is provided below.

Several observations were summarized from the water quality modeling effort which examined a range of nutrient concentrations over both low (10<sup>th</sup> percentile) and average (50<sup>th</sup> percentile) flow regimes.

In the Nevada region of the Truckee River (East McCarran Blvd. to PLPT Boundary), the level of DO criterion violation is low over the entire range of annual average nutrient concentrations examined. Additional observations include:

- For both low and average flow regimes, the DO criterion compliance does not show a sensitivity to increasing phosphorus concentrations;
- For the low flow regime, the DO criterion compliance shows a slight sensitivity to increasing TN concentrations; however, this response does not occur unless the annual average TN concentration is greater than approximately 0.80 mg/L; and

In the PLPT region of the Truckee River, the level of DO criterion violation varies depending on the annual average nutrient concentration and the flow regime. Additional observations include:

- For the low flow regime, the level of DO criterion violation in the Truckee River is sensitive to the annual average phosphorus concentration; however, no DO criterion violations were calculated for the average flow regime;
- For both the low flow and average flow regimes, DO criterion violation in the Truckee River does not show sensitivity to the average annual TN concentration over the range examined; however, for the low flow regime the DO criterion violations ranged from approximately 3% of days to 6% of days depending on the phosphorus concentration;
- For the average flow regime, no DO criterion violations were calculated for the Truckee River regardless of the annual average nutrient concentrations; and,

DO criterion violations in the Truckee River are seen to be sensitive to other factors beyond the instream phosphorus concentration such as flow condition, channel geometry and stream temperature.

The purpose of the process and analysis was to provide NDEP and USEPA with technical information to support the triennial review of the nutrient WQS for the Truckee River in Nevada. Any proposed recommendations for changes from the existing nitrogen and phosphorus numeric nutrient criteria would have needed to be documented by NDEP in a rationale document which would be available for public comment. Any proposed changes would need to be approved by the State Environmental Commission and USEPA before becoming effective under the federal Clean Water Act.

Two alternate scenarios for Nevada nutrient standards were given detailed examination: 1) Maintenance of existing standards, and 2) Switching the phosphorus standard from the existing TP=0.5 mg/L to the PLPT standard of OP=0.05 mg/L. Results showed that if the Nevada phosphorus criterion were changed to be consistent with the current PLPT criterion, there would be no expected increase in DO violations in the Truckee River under either low flow or average flow conditions compared to conditions under existing standards.

The full technical analysis was documented (LimnoTech, 2014) and presented to NDEP, key stakeholders and the interested general public during a public meeting March 3, 2014. Additional reports and presentations regarding the WQS review process are available from the TRIG website (<http://truckeeriverinfo.org/tmdl>).

After completion of the technical analysis, no immediate action was taken by NDEP to complete the WQS review. NDEP met with PLPT in April 2014 and Tribal representatives indicated their

intention to initiate their own triennial review of WQS for the Truckee River. A decision was made to suspend the NDEP WQS review until PLPT completed their review (NDEP, 2014).

#### ***4.6.3—Coordination with the PLPT's Water Quality Control Plan, Triennial Review and Water Quality Standards Revisions and Quantity Goals***

##### ***PLPT Water Quality Control Plan***

In January 2007, EPA granted the PLPT “treatment as a state” status for adoption of water quality standards and conducting CWA Section 401 water quality certifications within the boundaries of the Pyramid Lake Paiute Indian Reservation. In September 2008, the PLPT adopted a *Water Quality Control Plan* (“WQCP”), which addresses issues such as beneficial uses, antidegradation, water quality criteria, scientific justification, and implementation plans. The EPA approved the WQCP on December 19, 2008. The WQCP includes narrative and numeric water quality standards for Pyramid Lake, the lower Truckee River and all surface waters within the Reservation.

The WQCP includes numeric water quality criteria for both nitrogen and phosphorus. The total nitrogen standards in the WQCP are identical to the ~~state Nevada~~ criteria applicable to the ~~Truckee R~~river from McCarran Boulevard to Wadsworth. However, with regard to phosphorus, the WQCP criterion is expressed as orthophosphate, in contrast to the state’s 1984 criterion for TP, which is a more stringent standard. The WQCP criterion is designed to protect the most sensitive beneficial uses of the downstream reaches of the river. According to the WQCP, the orthophosphate criterion is “based on its secondary importance in regulating algal growth” (PLPT, 2008). The WQCP notes the advantage of this criterion over TP is that “it regulates the availability of phosphorus to the algae” and avoids triggering exceedances of the water quality standards due solely to increased turbidity, which is separately regulated. ~~The Nevada standard was likely adapted from EPA 304(a) advisory criteria and is acknowledged to be a provisional value awaiting better science.~~

~~As noted above, the PLPT recently developed criteria for orthophosphate applicable to downstream reaches of the river within the PLPT's jurisdiction. Given the inconsistency between the two criteria, and the more current nature of the scientific studies underlying the PLPT standards, the Third Parties are pursuing possible revisions to the existing state criteria.~~

Related triennial reviews have caused delays in the Nevada-based Truckee River standards review, including those for Lahontan Reservoir and Pyramid Lake. As of January 2015, the PLPT has undergone a Triennial Review of their water quality standards and made recommendations for an update to NDEP and US EPA. This review is being reviewed by the regulatory agencies currently. This action has halted Nevada reviews until it is finalized.

##### ***Triennial Review and Water Quality Standards Revisions***

~~On April 27 and April 30, 2015, the PLPT conducted public workshops to present the Triennial Review process and methodologies for review of their *Water Quality Control Plan* (i.e., water quality standards). On June 3, 2015, the PLPT presented results of their Triennial Review of water quality standards (WQS) and rationale for proposed changes to certain standards. The PLPT provided a public comment period from May 26, 2015 to August 21, 2015.~~

The PLPT proposed a significant change to the dissolved reactive phosphorus (DRP) criterion for the Truckee River, reducing it from 0.05 mg/L to 0.022 mg/L. The proposed standard was set to provide consistency with the existing NDEP TP criterion (set in the 1980's), but no justification was provided on the appropriateness of the current NDEP TP criterion. The PLPT finalized their Triennial Review and Water Quality Control Plan on September 15, 2015. The proposed reduction of the DRP criterion for the Truckee River (annual average  $\leq 0.022$  mg/L P) was implemented (PLPT, 2015d)

### **Potential Implications of WQS Outcomes**

With the revised PLPT DRP criterion approved, it is highly unlikely that the NDEP TP criterion would be revised to a value higher than 0.05 mg/L. This is due to the fact that water quality standards from upstream jurisdictions must maintain compliance with water quality standards for downstream jurisdictions.

#### **4.6.12 Public Outreach Programs**

##### ***Non-point Education for Municipal Officials***

The UNR Cooperative Extension houses and staffs the NEMO Nevada Program. NEMO has provided workshops and education for advisory board members, city councils, county commissioners, planners, engineers, and others since 2004. The program is funded via 319(h) grants from Nevada Division of Environmental Protection. Free 3.5-hour trainings are offered in the spring and fall each year to help attendees understand the link between changes in land use and water quality impacts. The trainings focus on the use of LID as a tool for capturing and processing storm water. Beginning in the Truckee Meadows, the program has now expanded to include Douglas and Lyon Counties.

Many presentations have also been made directly to the state land-use planning advisory committee, advisory boards, planning commissions, conservation districts, river coalitions, landscape architects, master gardeners and others interested in strategies for managing storm water pollution. Special seminars address issues such as water harvesting, riparian buffers, and slope stabilization. In 2010, NEMO began offering free field trainings in the appropriate choice and correct installation and maintenance of construction site BMPs. The NEMO program also led a Riparian Buffers workshop in March 2010, the first of its kind in the Truckee Meadows.

Additional educational elements include a website ([www.unce.unr.edu/nemo](http://www.unce.unr.edu/nemo)) that includes information on local LID projects, a photo gallery, a searchable database of plants for LID, and many publications and action guides. These publications are available upon request for use at public events.

### ***River Permitting***

Working in or around the Truckee River on restoration, flood control, and construction projects requires many permits, protective measures and monitoring to meet federal, state and local guidelines and regulations. The RWMF funded the [Truckee River Restoration and Construction Site Permitting Handbook](#) (Kennedy Jenks Consultants 2009), which includes a Permitting Process Flowchart to assist users in completing all required permits for river protection, available for download at [www.tmstormwater.com](http://www.tmstormwater.com) or [www.washoecounty.us/water/index.htm](http://www.washoecounty.us/water/index.htm). In May 2009, the Handbook was used for a Working in the River and Permitting Workshop, offered in Reno to guide users through the Handbook and the permitting process. Along with development of the Handbook, mapping was created to show the regulatory authorities governing various reaches of the river from the state line to Pyramid Lake. This map has been integrated as an interactive tool in the Watershed Map Server (see below).

### ***Watershed Map Server***

The Reno Map Server is a tool available to all internet users through the Reno website (<http://maps.cityofreno.net/>). In 2007, sufficient interest built in extending mapping abilities to the watershed by incorporating tributaries to the Truckee River, including all creeks assessed in the Watershed Assessments (Jesch and others, 2005-2009). The City built a Watershed Map Server as part of the existing GIS tool, but took information directly from the Assessments.

### ***~~The Watershed Map Server~~***

The website (<http://maps.cityofreno.net/watershed/>) includes: Photos and photo points referenced on the map, introduction, assessment text of middle and lower reaches of each stream, and “tips to help your creek”. Individual maps may be accessed by creek name or region, and drilled down to an aerial photo at the greatest level of resolution. Technical users who understand GIS are able to optimize its use and the latest in upgrades to this system include a permit area portal. Parties looking at completing a construction, restoration, or flood project on a portion of the Truckee River, can access all permitting agencies for that location by zooming to “permit area”. This last section was completed to accent the River Permitting class offered in 2008.

### ***Truckee River Watershed Map Tool***

The Truckee River Watershed Map Tool was initiated by Reno, with support from the Truckee River Fund as an outreach tool targeting middle and high school students. The existing Map Server, as a GIS tool, was not readily usable by non-technical internet users. This interactive, intuitive map-based tool allows users to view and explore the creeks near homes and schools online. The tool includes vegetation, wildlife, photos from the *Watershed Assessment* (Jesch and Jesch, 2009), and other interesting facts about each subwatershed. This tool has been shared with teachers throughout the Washoe County School District and throughout northern Nevada.

Over 40 teachers throughout the Washoe County School District have been advised of this tool, while it was still in the production phase. Teachers will be trained on using the Truckee River Watershed Map Tool with students, as the last phase of this project. This will be completed in

conjunction with existing trainings throughout the school district, as well as with environmentally-directed teacher trainings hosted by NDEP such as Project Wet.

### ***Chalk Creek Outreach***

The watershed assessments have found that Chalk Creek in northwest Reno has elevated P, N and TDS. As part of a three-part approach to address this problem, Reno used Truckee River Fund support to retain Olsen and Associates to develop and implement a public outreach program, one of the three parts. The effort targeted residents and owners of large turf areas to encourage adoption of more responsible outdoor water and chemical use practices.

Initial meetings with residents emphasized a positive, stewardship-based message and avoided creating fear about contaminating the water supply. Owners of large turf areas were also identified. In addition, residents were surveyed concerning their knowledge of outdoor runoff and storm water pollution both before and after informational presentations based on the results of technical studies. Ninety-seven percent of post-presentation surveys indicated an increased awareness of what goes into neighborhood creeks and 82 percent agreed with the statement, "The presentation influenced me to change my watering, yard care and/or storage practices."

### ***TMWA Outdoor Water Conservation***

TMWA offers an online water efficient landscape guide for maximizing responsible water use in the desert, using the seven horticultural principles to reduce outdoor irrigation while providing a lush and attractive outdoor area. The vast array of informational topics covered in the interactive tool include: landscape design and proper planning, planning an efficient irrigation system, plant search (by exposure or other needs), soil improvement, mulching, planting and maintenance.

This online, interactive guide for homeowners can be found at [www.tmwandscapeguide.com/landscape\\_guide/interactive/index.php](http://www.tmwandscapeguide.com/landscape_guide/interactive/index.php). TMWA also provides an incentive to reducing water use outdoors, the Water Efficient Landscape Awards. This annual competition has two categories for either design by homeowner or designer, and TMWA provides free community tours of the winners' properties the following year, to share the wealth of learning by seeing conservation in action.

### ***TMWA Watershed Academy***

TMWA is dedicated to educating our youth for better tomorrows. The watershed academy web site (<http://www.tmwaacademy.com/index.shtml>) is provided to inform students and teachers and to give them the skills and knowledge they need to become informed conservers and consumers. Educational curriculum is available for teachers to use with students in four grade ranges, from kindergarten through high school. TMWA routinely holds poster contests for students and the educational approach is a high TMWA priority in outreach. Resources available to teachers include lesson plans for each grade, as well as online tools for use with students, a library of TMWA and other water-related publications, and other resources.

### ***Truckee Meadows Urban Forestry Coalition***

~~In 2008, led by TMWA, a group of agency members began meeting with the goals of preserving, protecting, and promoting a sustainable urban forest for the Truckee Meadows community. The group drafted a MOU to recognize this commitment, and Sparks, Reno, TMWA, and the~~

~~Washoe County Department of Parks and Recreation signed on as members. The priorities of this Coalition are public education, community benefits and buy-in, and protecting and saving areas of concern within the Truckee Meadows.~~

### ***One Truckee River Management Plan***

The Truckee River Management Plan, with four primary goals and over 140 strategies and action items, is One Truckee River's first step toward achieving its broad vision for the Truckee River. Phase One covers the largely urban stretch of river from West McCarran Boulevard in Reno to Vista Boulevard in Sparks. The plan's primary goals are to:

- 1) Protect water quality and ecosystem health
- 2) Create and sustain a safe, beautiful and accessible river
- 3) Build an aware community
- 4) Ensure the sustainable management of the river.

Most of the Truckee River and the Truckee River corridor is managed and regulated by federal, state and local agencies. One Truckee River seeks to coordinate existing efforts rather than create a new regulatory agency. Some important efforts and programs included in the plan are already the responsibility of individual One Truckee River stakeholders, and will gain additional support and recognition through the plan. Other projects and tasks need additional partners and support. Finally, the plan identifies gaps in priority areas where new programs should be developed to provide for long-term management and sustainability.

Nine emerging issues have been identified by One Truckee River:

- 1) Water Quality
- 2) Social Issues
- 3) Stewardship
- 4) Ecosystem
- 5) Quality of Life
- 6) Public Safety
- 7) Funding
- 8) Recreation
- 9) Education

The One Truckee River Management Plan, Phase One, can be viewed at:  
<http://onetruckeeriver.org/>.

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