Middle Truckee River Watershed Total Maximum Daily Load for Sediment
Placer, Nevada and Sierra Counties

Responses to Public Review Comments

Prepared by Lahontan Water Board staff
April 2008

INTRODUCTION

The following provides Lahontan Water Board staff's responses to public comments received on the draft *Middle Truckee River Watershed Total Maximum Daily Load for Sediment* and associated draft Basin Plan amendment language and California Environmental Quality Act (CEQA) "substitute document." The documents were circulated for review from February 5 to March 21, 2008, consistent with requirements to give members of the public and agencies 45 days to review and provide comments pursuant to CEQA.

Ten comment letters were received during the comment period. Each comment letter was assigned a number and each comment in the letter was assigned a decimal number. For example, the first comment in Letter 1 is designed "1.1", the second comment is "1.2", etc. Water Board staff's response is immediately below each comment in **bold** font. Copies of each comment letter are included in Attachment 1.

COMMENT LETTERS AND AUTHORS

Letter 1:	Barry Hill, Hydrologist, for Tom Quinn, Forest Supervisor, USDA Forest Service- Tahoe National Forest
Letter 2:	Joseph Furnish, Aquatic Ecologist, for Tom Quinn, Forest Supervisor, USDA Forest Service- Tahoe National Forest
Letter 3:	Doug Praetzel, Forester, Sierra Pacific Industries
Letter 4:	Lisa Wallace, Executive Director, Truckee River Watershed Council
Letter 5:	Pat Davison, Executive Director, Contractors Association of Truckee-Tahoe
Letter 6:	Krista Coulter, State of Nevada Clearinghouse
Letter 7:	G. Scott McGowen, Chief Environmental Engineer, California Department of Transportation
Letter 8:	Terry Roberts, Director, State of California Clearinghouse
Letter 9:	Katy Sanchez, Program Analyst, Native American Heritage Commission
Letter 10:	Jack Landy, Tahoe Basin TMDL Coordinator, United States Environmental Protection Agency

RESPONSES TO COMMENTS

LETTER 1: Barry Hill, USDA Forest Service-Tahoe National Forest (USFS-TNF)

Comment 1.1: General Comment - The documentation of methods used for the Herbst and Kane 2006 study lacks almost all the elements of a Quality Assurance Project Plan (QAPP) established by the US Environmental Protection Agency (USEPA).

Response 1.1: QAPP issues were clarified by the USFS-TNF's other commenter, Joseph Furnish (see comment 2.4). He reviewed the QAPP prepared by Dr. Herbst, and found that it provided all of the requisite information to satisfy QAPP standards. No further response is needed.

Comment 1.2: p. 3-7 - Quality assurance information is needed to determine the adequacy of the DWR (i.e., Department of Water Resources continuous turbidity monitoring) data for drawing any conclusions about impairment. Instrument fouling would tend to produce spurious high turbidity values, which might explain the disparities between the USGS and DWR data sets. As the USGS and DWR monitoring apparently overlapped in 2002, the report should include a comparison of USGS and DWR data for the dates and times of USGS sample collection in addition to DWR QA/QC results.

Response 1.2: This comment relates to Water Board staff's analysis of the continuous turbidity monitoring data collected by the DWR for the Desert Research Institute's suspended sediment loading study (DRI, 2004). In discussing the analysis, we recommended caution when interpreting the results of the continuous turbidity monitoring for several reasons, including the potential for instrument malfunction and data cleanup issues, which may have resulted in anomalously high values of turbidity being reported. This would cause difficulties in comparing the data to the "mean of monthly mean" turbidity water quality objective (WQO), because the high anomalous values would overly influence (skew) the mean value to appear higher than the true mean.

Our intent in providing this discussion was to give full disclosure to the reader regarding issues we considered when interpreting the data. For example, our examination of the raw DWR data showed wide variability in turbidity measurements within short time frames under consistent flow conditions, suggesting that some of the very high turbidity measurements may be the result of instrument fouling (e.g., a leaf stuck on the sensor), rather than truly turbid water.

While we felt it was important to acknowledge these potential data issues, we do not believe they were significant enough to justify removal of the DWR data from consideration, since the DWR continuous turbidity monitoring was the only data available to discern short-term pulses of turbidity moving through the system

that may have been missed by the turbidity grab sampling, which was typically conducted monthly.

According to DRI (2004), the continuously logged turbidity data were downloaded, reviewed for accuracy and adjusted for calibration drift according to US Geological Survey (USGS) guidelines (*Guidelines and Standard Procedures for Continuous Water Quality-Monitoring: Site Selection, Field Operation, Calibration, Record Computation and Reporting*, WRIR 00-4245). Therefore, it appears quality control/assurance procedures were implemented, but even so, some anomalous values may have been reported.

In sum, we believe that assessing these data in conjunction with all the data allows for a more complete picture of sediment and turbidity conditions in the Truckee River. We will clarify the TMDL text regarding this topic to make it clear that while we considered and fully disclosed the limitations of the data, we feel its use is appropriate for the TMDL analysis.

Comment 1.3: p. 3-9 - The SSC (suspended sediment concentration) benchmark of 25 mg/L as the 90th percentile, used in the TMDL report as an impairment threshold, is very conservative and was based on a very limited number of information sources. Much more information is available and should be considered in establishing an appropriate impairment benchmark. The internal EPA report titled "The Biological Effects of Suspended and Bedded Sediment (SABS) in Aquatic Systems: A Review, by Walter Berry, Norman Rubenstein, Brian Melzian, and Brian Hill, dated August 20, 2003, includes several hundred references relevant to effects of suspended sediment on aquatic organisms.

Response 1.3: We did consider the USEPA's 2003 report mentioned above, and will include a reference to it in the administrative record for the TMDL. The USEPA report cites many of the references included in the TMDL and numeric target literature review (e.g., Idaho DEQ, 2003; Newcombe and Jensen, 1996; Waters, 1995; USEPA, 1999). The report does contain "several hundred references relevant to effects of suspended sediment on aquatic organisms", as the commenter states, and the source of most of those references on the effects of suspended sediment on salmonids (the focus of our literature review) come from Newcombe and Jensen 1996 (see Appendix C of the USEPA 2003 report). We considered Newcombe and Jensen's work for our literature review as well, and the SSC TMDL target is not inconsistent with this work. The recommended SSC target of 25 mg/L (90th percentile) is also consistent with State of Nevada standards for total suspended solids (TSS) in the Truckee River, and was found by both scientific peer reviewers to be appropriate:

> **Dr. J. Fox:** ***"Targets appear well studied based on beneficial uses in the watershed and literature research. The calculation method appears correct. The general conclusion is that the targets are currently being exceeded and improvements are needed in the watershed."***

Dr. NL Poff: ***"The method used for identification of a 25 mg/L numeric target for suspended sediment is reasonable given the existing scientific literature and the correspondence of known/inferred SSC on comparable sensitive aquatic species (salmonids) in the middle Truckee River. If the goal is to provide guidelines for high levels of protection (as outlined on pp. 4-2 and 4-3), the 25 mg/L target is reasonable."***

Lastly, USEPA Region 9 comments on the draft Truckee River TMDL support the choice of the numeric target, stating "the evaluation of suspended sediment data based on the judgment that 25 mg/L TSS/SSC (as a 90th percentile of annual datasets) causes adverse impacts to aquatic life is consistent with EPA guidance and the preponderance of information concerning aquatic life impairment."

Comment 1.4: p. 3-9, table 3-3 - Suspended-sediment data (shown in Table 3-3) show no impairment for sediment at Farad over a 28-year period, based on the 25 mg/L 90th percentile impairment threshold (benchmark).

Response 1.4: Table 3-3 shows flow and SSC data for locations along the Truckee River and major tributaries. Over the entire period of record (1975-2006), the overall 90th percentile SSC at Farad is just under the benchmark. The text describing information presented in Table 3-3 does not state that the period *of record data* at Farad exceeds the benchmark. We are simply presenting the overall dataset that we used as a screening analysis to evaluate sediment conditions throughout the watershed. Discussion of the existing conditions at Farad compared to target is included in Section 4 (Targets). Regarding our conclusions regarding impairment due to sediment at Farad, please see response to comment 1.9.

Comment 1.5: The report notes that the SSC data may be biased toward lower concentrations owing to sampling at lower than representative flows. This should be evaluated in the report by comparing the range of streamflow at SSC sampling times to streamflow throughout the monitoring period. Data presented in Figure 3-2 indicate that samples were collected throughout the range of flow, and if so, the SSC data are unlikely to be biased toward lower concentrations.

Response 1.5: Figure 3-2 shows a sediment loading duration curve for the Farad sampling site, which does provide the evaluation requested, as do the load duration curves in Appendix A. We agree that for the Farad sampling site, Figure 3-2 shows that samples were collected over the range of flows observed in the river, and are not biased toward any particular flow condition. This observation is further emphasized in the TMDL on page 4-4 and Figure 4-1, where we state that "SSCs were collected over the full range of average daily streamflows recorded at Farad." We stress this because, as stated on page 4-4, ". . . a dataset biased toward high (or low) flow sampling would not be appropriate to compare to the proposed target."

The statement regarding high or low flow targeted samples was not specific to the Farad sampling site, but was presented as a general discussion relevant to sediment sampling in general. However, review of the load duration curves provided in Appendix A show that for most of the tributaries, and at Farad, SSC sampling does not appear to be heavily biased toward any particular flow condition. Therefore, to avoid confusion, we will remove the discussion about sampling bias.

Comment 1.6: pp. 3-11 to 12, figure 3-2 - The assumed SSC benchmark is 25 mg/L as the 90th percentile. Therefore, 10% of observed SSC concentrations can exceed 25 mg/L without exceeding the benchmark. The statement that all samples that exceed the 25 mg/L threshold exceed the benchmark is incorrect because exceedance can only be determined by comparing the number of samples with concentrations above 25 mg/L with the total number of samples.

Response 1.6: We agree the statement is incorrect as it applies to this section of the TMDL, and will clarify the text to explain how the duration curve is used to examine SSC and streamflow conditions to determine when higher SSCs occur. In the section referred to in the comment (Section 3, Problem Statement) we have not yet discussed the actual SSC target and how it is applied (this discussion is in Section 4, Targets). The target is an annual 90th percentile SSC value, so we will evaluate the SSC values collected over one year to determine if the target is met. We will not assess the target using the period of record (all historic data) lumped together, because this type of analysis, which yields only one data point, does not allow improvements in upslope conditions (e.g., BMPs implemented) to be reflected in the evaluation.

Comment 1.7: The comparison between SSCs at Tahoe City and Farad does not necessarily indicate excessive erosion in the intervening watershed; the river at Tahoe City is flowing directly out of Lake Tahoe, an extremely effective sediment trap. Even in the absence of anthropogenic erosion, SSCs would likely be higher at Farad than at Tahoe City as a result of natural erosion in the intervening watershed and channel.

Response 1.7: While higher SSCs at Farad compared to Tahoe City may not necessarily indicate excessive erosion between the two sampling sites; the opposite is not necessarily true either (that there *isn't* excessive erosion). However, since there are anthropogenic sources of erosion between the two sites, it is more reasonable to assume that the increased SSC is attributable, in part, to anthropogenic sources.

Comment 1.8: p. 3-14—Results of the Herbst and Kane 2006 study of deposited sediment and macroinvertebrates do not clearly demonstrate sediment impairment of the Truckee River.

Response 1.8: This comment was refuted by the USFS-TNF's other commenter, Joseph Furnish, who stated:

> **"In summary, the study by Herbst and Kane clearly demonstrated that the invertebrate communities of the Middle Truckee River are impacted and that they serve as useful indicators to establish desirable sediment loadings to the system."**

Further, independent scientific peer review (Dr. N. L. Poff) found:

> **"Although there is broad scientific agreement that sediment can impair biological communities, there is no general scientific consensus as to what methods are best used to establish direct causal links between increments of sediment addition and biological degradation, especially in natural field settings characterized by complex hydraulics and streambed heterogeneity. I view the data from Herbst and Kane's (2006) study as providing support for the inference of biological impairment of benthic invertebrate communities under existing sediment loading conditions in the middle Truckee River."**

In sum, Water Board staff believes that the available information, including bioassessment, SSCs, and turbidity data, supports the conclusion that existing sediment loading in the Truckee River, particularly during higher flow conditions, should be reduced in order to protect aquatic life beneficial uses. This conclusion is also supported by independent scientific peer review, and the USFS-TNF's own aquatic ecologist.

Comment 1.9: p. 3-15, section 3.3.4, Conclusions, item 1.-The statement that SSC samples at Farad indicate exceedance of benchmarks for protection of aquatic life is incorrect.

Response 1.9: Our conclusion states that SSCs at Farad exceed benchmarks at certain (high) flows, which is correct. As shown in Figure 3-2, at flows that are equaled or exceeded 40 percent of the time, fifteen percent of the measured SSCs are greater than 25 mg/L, indicating that the benchmark is exceeded at these flows. Using the load duration curve to identify hydrologic conditions of concern is an appropriate application, and our conclusion is consistent with this.

Further, USEPA Region 9 considered the SSC dataset in its review of the draft TMDL, and concluded, "The evaluation of suspended sediment data based on the judgment that 25 mg/l TSS/SSC (as a 90th percentile of annual datasets) causes adverse impacts to aquatic life is consistent with EPA guidance and the preponderance of information concerning aquatic life impairment. Of the 27 years for which SSC data are available, this target value is exceeded six times (over twice the 10 percentile allowable). Furthermore, if the first and second

halves of the dataset are considered, there are twice as many years in exceedance in the more recent half than in the first half of the period of record."

Comment 1.10: p. 3-15, section 3.3.4, Conclusions, item 2.—Please see comment 1.2, above.

Response 1.10: Please see response 1.2, above.

Comment 1.11: 9. p. 3-15, section 3.3.4, Conclusions, item 3.—Please see comment 1.8, above.

Response 1.11: Please see response 1.8, above.

Comment 1.12: 10. p. 3-15, section 3.3.4, Conclusions, item 4.—This result shows that 62.5% of the sampling sites, well over half, show no impairment.

Response 1.12: Conversely, the results show that 37.5 percent of the sites show impairment. We do not consider over 35 percent of sites showing evidence of impairment to be acceptable. Further, according to USEPA guidance (USEPA 2002), for an aquatic life beneficial use to be considered "fully supported", allowable exceedance rates should be ten percent or less, well below the almost forty percent observed here.

Comment 1.13: p. 3-15, section 3.3.4, Conclusions, item 6.—Future growth is inappropriate as a rationale for TMDL development. Effects of urban growth on sedimentation should be handled under local grading ordinances and BMPs. No net increase in sediment should be assumed for future growth.

Response 1.13: Future growth is used as a supplemental indicator supporting the conclusion that sediment loading should be reduced. Although the effects of future growth will be controlled through the application of best management practices (BMPs) required under existing ordinances and permit conditions, we cannot assume that these controls are 100 percent effective. Therefore, it is appropriate to assume that future growth will increase total sediment loading to some extent.

Comment 1.14: p. 4-2—see comment 3. above re: available information related to sediment effects on aquatic organisms.

Response 1.14: **Please see response to comment 1.3.**

Comment 1.15: Exceedance of the 25 mg/L threshold for only 5% of total samples indicates that the benchmark of 25 mg/L as the 90th percentile is not exceeded.

Response 1.15: Please see response to comment 1.9. The section of the TMDL referred to in the comment discusses streamflow conditions when target

exceedances occur. For streamflows that occur 40 percent of the time, fifteen percent of the samples are greater than 25 mg/L, and the benchmark allows for a ten percent exceedance. This is a five percent exceedance of the benchmark.

Comment 1.16: p. 5-4—The DRI (2001) study used a sediment transport curve ("rating curve") approach to estimate current-condition suspended-sediment loads in the Truckee River and its tributaries. The application of this approach involved several technical inadequacies that limit the usefulness of the results for determining existing sediment loads and "target" loads to be achieved through TMDL implementation, including:

a) Depth-width integrated isokinetic (EWI) sample concentrations were pooled with grab sample concentrations and TSS results were pooled with SSC results to develop transport curves despite a lack of verification of relations between EWI and grab sample concentrations or TSS and SSC concentrations at higher flows that are critical for sediment transport.

Response 1.16a: DRI <u>did</u> verify the relationship between depth-integrated samples and grab samples. See page 29 of the DRI (2001) report, section 3.2.2.3.*1 Integration of Datasets*:

> **"Twenty-six integrated samples were collected from the middle Truckee River at the same time as grab samples. Analysis of both integrated and grab samples shows insignificant differences in SSC between the collection methods."**

b) Equation 5, used to estimate sediment concentrations for times at which no samples were collected, is mathematically incorrect. The equation should be expressed in terms of Q rather than log Q.

Response 1.16b: Water Board staff agrees that Equation 5 in DRI (2001) is incorrectly expressed, as noted by the commenter. However, the equations used by Water Board staff to estimate loading in the TMDL were taken from Appendix D of the DRI 2001 report, which show the subwatershed-specific regression equations, rather than just the (incorrect) general form of the regression shown in Equation 5. These equations are correctly expressed and are consistent with Equation 5, if corrected as recommended by the commenter. The staff report will be revised to include an appendix to clearly identify the correct equations used in the loading estimates.

c) Equation 6, used to estimate average daily sediment loads, is also incorrect for this reason. Furthermore, Equation 6 assumes that sediment load and sediment concentration are the same, where in fact sediment loads are determined by multiplying concentrations by streamflow and a units conversion factor.

Response 1.16c: See response 1.16b. The conversion factor needed to convert from concentration to load is included in the equations shown in Appendix D of the DRI (2001) report. The report will be revised to include an appendix to clearly explain the derivation of the final equations used in the load estimates.

d) Although instantaneous streamflow data were used as the independent variable to develop equations 5 and 6, daily mean streamflows were used with the equation to estimate loads. Although the authors argue that this is an acceptable practice, this approach is statistically invalid because it applies a regression to data that are not of the same type used to develop the equation.

Response 1.16d: The DRI report authors state that "the general good agreement between the USGS sediment rating curves constructed from instantaneous flow measurements and the DRI rating curves using average daily flow values validates this procedure." Therefore, it appears the report's authors were aware of the issue and investigated the application of the average daily flows to rating curves developed from instantaneous flows and found the application to be satisfactory, and not invalid as asserted. The commenter provides no information to support his assertion over that of the report's authors.

e) The sediment transport curve method requires the assumption of a direct relationship between sediment concentration and streamflow, that is, as streamflow rises concentration rises. However, data presented in the DRI (2004) report show that concentration peaks and streamflow peaks may not coincide. The load estimates developed using the sediment transport curves will be higher than the actual loads for stations with non-synchronous concentration and streamflow peaks.

Response 1.16e: This comment, and following four comments (1.16f, 1.16g, 1.17, and 1.18) all refer to the accuracy of the sediment loading estimates contained in the TMDL's Source Assessment.

The draft TMDL Source Assessment specifically calls the reader's attention to the fact the sediment loading fluctuates greatly from year to year, and that loading estimates evaluated by different calculation methods or based on different water years vary by an order of magnitude or more. We included this statement to help the reader understand that while quantified source assessment are required by the USEPA (USEPA 2000, p. 4), the estimates in the source assessment are most appropriately used to understand relative, rather than absolute loading values (draft TMDL, p. 5-1).

This is consistent with guidance provided by the USEPA. In its *Protocol for Developing Sediment TMDLs*, the USEPA addresses the accuracy of different source analysis methods, stating that, "simpler, screening-level methods are believed to be capable of yielding order-of-magnitude estimates of total

sediment production along with estimates of relative inputs from different sources (USEPA, 1999, p. 5-5).

We do not attempt to depict the estimates presented as any more accurate than order-of-magnitude at best, and took great pains to make this clear.

The purpose of the source assessment is to characterize the types, magnitudes and locations of sediment loading to the waterbody (USEPA, 1999). The data and methods used to express sediment loading estimates are sufficient to meet this purpose, and we have fully disclosed the limitations and strengths of the data.

f) Accurate determinations of sediment loads require sediment samples over the range of flow experienced during the period of interest, which in this case is 1996-97. The highest flows for which sediment samples were collected for this study were much lower than the peak flows recorded at USGS gages for this 2-year period. Therefore, estimating sediment loads for the critical high-flow periods required extrapolation of the sediment transport curves well beyond the range of the data used to develop them. There is no way to determine the accuracy of these estimates.

Response 1.16f: Please see response to comment 1.16e.

g) Most of the tributaries for which sediment loads were determined lacked records of streamflow. Streamflow records were synthesized by comparing streamflow measurements at the tributaries with recorded streamflows at nearby gages. No information is provided on the number of streamflow measurements used for the comparison or the range of flows measured relative to the annual extremes. Prediction intervals for estimated sediment loads range over one to two orders of magnitude, indicating substantial uncertainty in the computed loads.

Response 1.16g: Regarding information on the synthesis of streamflow records: four of the ten tributaries lacked flow information for the water years analyzed in the TMDL. We will provide information on flow synthesis as an appendix to the TMDL. Regarding the uncertainty in computed loads, please see response to comment 1.16e.

Comment 1.17: p. 5-10-- Sediment samples collected for the DRI (2004) report did not include samples representative of high flows. For example, the maximum flow sampled at Farad was 1,308 cfs, while the peak flow during the 2002-03 study period was 1,770 cfs and the peak of record was 17,500 cfs. Therefore, concentrations and loads estimated for flows higher than the sampled range are highly uncertain. Several of the estimated monthly sediment loads reported in the DRI (2004) report are much too high to be credible, and cast doubt on the modeling approach used in this study. In particular, the estimated load of 61 million tons for the Farad station in June 2002

(equivalent to land surface lowering of roughly one inch per month across the entire watershed) is not reasonable.

Response 1.17: Please see response to comment 1.16e regarding uncertainty in sediment loading estimates.

We agree that the DRI (2004) report contains some estimates that are much too high to be credible. We acknowledged this fact in the TMDL on p. 5-9, and in our response to scientific peer review (Dr. J. Fox), where we stated:

> **The DRI 2004 report notes that model was "based on relatively few high turbidity observations compared to those with moderate turbidity" and that "more frequent maintenance of the turbidity sensors would improve the temporal data record, and allow the calculation of annual sediment loads." In this regard, it appears that the model predictions may not be representative under higher turbidity conditions. As an example, it is estimated in Table 3.2 that there was over 61 million tons of sediment loading at Farad in June 2002. Based on the total flow for the month, this value suggests that the average monthly SSC was over 2 pounds per liter, a value that is obviously not reasonable.**

However, we considered that the DRI (2004) information provided a more complete picture of sediment loading than depicted by the grab sampling SSC or turbidity data alone, which may have missed some shorter-term, intense loading events (due to thunderstorms, snow melt or dam releases).

In the end, we fully disclosed the limitation and strengths of the DRI (2004) study (see page 5-10 of the draft TMDL), and concluded that in order to appropriately represent sediment loading, both datasets should be fully considered. See also response to comment 1.2 regarding our consideration of the DRI (2004) data.

Comment 1.18: p. 5-13—The estimated loads from urban areas using the EMC approach are low because they only account for the increased sediment concentrations from urban areas. Loads are computed as products of flow, concentration, and a conversion factor. Runoff (flow) from urban areas has been demonstrated to be higher than forested watersheds owing to large areas of impervious surfaces. The estimated loads from urban areas should be based on increases in both sediment concentration and flow.

Response 1.18: Water Board staff does not have data to complete the analysis suggested by the commenter. Nonetheless, the source assessment provides a rough estimate of loading and identifies significant sources, including urban areas, for purposes of planning implementation actions.

Comment 1.19: p. 5-20, table 5-6—"Intervening zone" sediment loads are estimated as the difference between the estimated load at Farad and the sum of the estimated

tributary loads. This represents 32% of the total suspended sediment load at Farad, and is therefore an important number to determine accurately. As the estimated loads for Farad and the tributaries are subject to large uncertainty, an independent assessment of sediment loads from the intervening area should be undertaken.

Response 1.19: Intervening zones and unmeasured inputs are those areas for which no sediment sampling or stream flow data were available, explained on page 5-4 of the draft TMDL. Therefore, we cannot evaluate the loading from these areas other than the "mass balance" approach we used. However, we agree, as part of implementing the TMDL, land managers and local jurisdictions should complete assessments of sediment sources from these intervening areas.

Comment 1.20: p. 6-2, table 6-1 - Although the data have been arbitrarily grouped to produce results that suggest exceedance of the benchmark at Farad, the complete long-term SSC data set does not indicate impairment, nor does the long-term USGS turbidity data. If the benchmark is meant to apply to time frames other than the entire period of record, then this should be stated earlier in the document and justified with results from scientific literature. The separation of SSC data into years was not previously discussed and is not consistent with the analysis of the entire data set (p. 3-7, table 3-3). This is important given the approach used to determine the required load reduction (see comment 20 below).

Response 1.20: We disagree that the data are "arbitrarily grouped." The target is not evaluated over the period of record, but on an annual basis. A period of record evaluation yields only one data point (e.g., one 90th percentile value for the entire dataset). This type of evaluation is not useful to attempt to discern improvements or trends in water quality, because with this type of long-term data evaluation, past water quality data overly influence the dataset, and do not allow for improvements in upslope conditions to be represented in the evaluation. An annual evaluation is more appropriate and useful.

Further, the use of an annual evaluation is consistent with State of Nevada SSC/TSS standards. We agree that we need to make this clear earlier in the document. We will specify that the target should be evaluated on annual basis in Section 4 (Targets), and provide the rationale for the annual evaluation.

Comment 1.21: p. 6-2 - The use of the estimated sediment loads for an unusually wet water year in determining load allocations is inappropriate given that the benchmark is the SSC 90th percentile for all years and not just the wet years.

Response 1.21: **The page cited by the commenter relates to a discussion on the load capacity, not the load allocations, and the comment appears to correlate the development of the SSC target with the type of water year used in the current load estimate.**

The load capacity was based on an estimate of current loading minus the load reduction required to meet the numeric SSC target. The current load was selected as the estimated loading from a wet water year (1996-1997), but could also have been selected from any water year. As stated in the TMDL, it is recognized that loads will vary significantly from year to year, but one estimate is needed to complete the load capacity and allocations. We chose an above average water year so that likely sediment transport conditions would be accounted for.

The load reduction (20 percent) was set based on the percentage of all years (wet or dry) that the annual 90th percentile SSC value exceeded 25 mg/L. The load capacity was then calculated based on the required reduction applied to the selected water year. Regardless of the number used for the current loading estimate, the key point is that an estimated 20 percent load reduction is needed to meet the target (whether it's applied to a wet or dry water year). This reduction estimate is provided to give a relative sense of the effort needed to reduce sediment loading.

Comment 1.22: p. 6-2--The method used to determine the required load reduction is mathematically incorrect. The load reduction of 20% was based on the percentage of ***years*** in which SSC 90th percentiles were at or above 25 mg/L and not any measure of the load itself. Even if we assume the separation of the SSC data into annual groups is warranted, this approach is flawed because it does not incorporate any measure of how much the actual sediment loads or concentrations would need to be reduced to meet the 25 mg/L benchmark. To compute the load reduction correctly, the 90th percentile for the entire data set for all years would need to be compared to the benchmark, but as noted above, this comparison would show that the benchmark is not being exceeded and therefore no load reduction is necessary.

Response 1.22: We disagree that the method used to determine the load reduction is mathematically incorrect. The load reduction is based on the number of years that the 90th percentile value exceeds 25 mg/L (as shown in Tables 4-2 and 6-1 of the draft TMDL). This is consistent with the annual basis for evaluation of the target. As stated in responses to comment 1.20, we will clarify the TMDL as to how the target is evaluated. Also, please see responses to comments 1.6 and 1.20 for discussion on why the target is not based on a period of record analysis, and why the annual evaluation is more appropriate.

The load reduction estimate is based on the difference between existing and target conditions, as recommended by the USEPA (1999). Because the sediment mass loading (in tons/day) will vary with flow, basing needed reductions on the sediment loading is not practical. The SSC target is consistent over the range of hydrologic conditions, and is easily measured and reported. Therefore, it is a reasonable basis for load reductions, and consistent with USEPA guidance.

Comment 1.23: p. 6-2, equation 6-2—As described in comment 20. above, the loading reduction computed this way is not correctly computed and all subsequent analyses using this computation are in error.

Response 1.23: see response 1.22.

Comment 1.24: p. 7-2, table 7-1—USFS BMPs monitored under the BMPEP for the Tahoe National Forest have been shown to be effective in preventing any effects to water quality for more than 80% of all evaluations.

Response 1.24: Comment noted. The USFS BMP Evaluation Program (BMPEP) relies on visual observations. The data provided in Table 7-2 reports removal efficiencies based on influent/effluent sampling data, a different type of assessment.

Comment 1.25: p. 7-2—no allocation should be made to future development. Not only is this highly speculative, but it puts the burden for reducing erosion from new development onto other parties that have no control over and derive no benefit from this development.

Response 1.25: We based the allocation to future development on estimates of the residential growth projections provided by the Town of Truckee and Placer County, which are not "highly speculative." In areas such as the Truckee River watershed, where growth and development are concerns, it is recommended by the USEPA that an allocation to future growth be made.

Comment 1.26: p. 10-10—A cooperative Lahontan Board-USFS approach to road erosion and legacy problems is within the scope of the revised workgroup strategy for recertification of the MAA.

Response 1.26: We agree, and look forward to working cooperatively with the USFS to address these issues.

Comment 1.27: p. 10-11—The Tahoe NF EIS for travel management will soon be publicly available, and comments from the Lahontan Board will be welcome.

Response 1.27: We have been in contact with USFS-TNF staff working on the travel management plan, and look forward to reviewing the EIS.

<u>LETTER 2: Joseph Furnish, USFS-TNF (Mr. Furnish's review was limited to Herbst and Kane, 2006)</u>

Comment 2.1: Basically, the report by Herbst and Kane (2006) adequately reviews the literature on sediment impacts to stream invertebrates. Although the experimental design made sense for providing the basis for establishing a biological TMDL, complications resulting from flaws in estimates of sediment yield and unexpectedly high

within-site variability in concentrations of fine sediments confounded a clear interpretation of the data. The flaws in the sediment yield models are thoroughly detailed in the comments from Barry Hill, Regional Hydrologist. The study by Herbst and Kane did clearly verify that aquatic macroinvertebrates are sensitive to fine sediments and that the metrics chosen to evaluate potential impacts behaved in the expected fashion (e.g. richness indices generally declined as sedimentation increased) in 11 of 13 instances and none in a counter intuitive way (Table 3, page 21 and Table 4, page 23).

Response 2.1: No response is required.

Comment 2.2: I believe that the lack of clear, consistent patterns of fine sediment deposition related to modeled sediment volumes from the tributaries sampled is more a reflection an inadequacy in the accuracy of the model in predicting inputs of fine sediment. Macroinvertebrate samples were collected at a micro-habitat scale along channel margins, which apparently did not accurately reflect sediment regimes above and below each site, which in turn did not allow elucidation of a dosage response by invertebrates to sedimentation. It would be appropriate and worthwhile to make an effort to improve the model to more accurately predict sediment yield from each tributary, partition sedimentation due to anthropogenic vs. natural causes, and establish the relationship between discharge and sediment dynamics. It would also be useful to attempt a back calculation of tributary sediment yield from the threshold of impairment at 3.4 kg m^{-2} dry fine sediment identified by Herbst and Kane. This may be intractable because there are so many important variables to account for in constructing a credible model and the more important question may be how sediments are distributed in the channel river, which in turn would help to predict where sediment impacts would be most apparent. In the case of fine sediments the most important determinant of impacts may be channel geomorphology favoring deposition rather than proximity to a tributary.

Response 2.2: No response is required.

Comment 2.3: In response to the high within-site variability observed additional replicate samples would be required to improve evaluation of site conditions and reduce variability to acceptable levels. As suggested by Herbst and Kane, pebble counts according to the Region's Stream Condition Inventory (SCI) Protocol, might more appropriately characterize sedimentation at the stream reach rather than micro-scale. I can say it no better than Herbst and Kane: "The challenge is to measure representative sediment deposition quantity and quality and associated benthic invertebrate communities at particular locations within zones of potential deposition, and to also characterize several representative reaches along the river that are exposed to variable sediment loads from particular tributary sources." Basically, I believe the authors are advocating a stratified sampling design based on channel geomorphology to predict and sample where sediment impacts are going to be most apparent. Given the high variability of river channel sediments, this may be a more useful approach than a strictly random location of samples.

Response 2.3: No response is required.

Comment 2.4: One clarification to the comments from Barry Hill that were submitted a few weeks ago: Although a Quality Assurance Project Plan was not available to him, I have reviewed the QAPP prepared by Herbst (2001) and am convinced that it provides all of the requisite information to satisfy State standards.

Response 2.4: Comment noted.

Comment 2.5: The anomalous results of the Trout Creek samples are troubling because they are so inconsistent with results from other sites, as well as those from the on-site targeted-riffle sample. Since there was no clear way to interpret why the site was an outlier, it is problematic to exclude it from the analysis. If the reason was fluctuation in discharge exposing the community to periodic drying, it raises the possibility that this may be an important, but unaccountable factor at other sites.

Response 2.5: According to Herbst and Kane, the Trout Creek site was too deep to sample using the pump core method, so the samples were taken very close to the bank margins (in other words, channel margin habitat was not present at the Trout Creek site as it was at the other tributary sites). Other factors that potentially affected macroinvertebrates at the site were noted, including the Highway 267 overpass, storm water runoff and nearby rail road tracks.

Comment 2.6: The comments regarding the loss of mussel beds comprised of the western pearlshell *Margaritifera falcata* over the last half century are noteworthy. Freshwater mussels are among the most endangered species on our planet (Lydeard and others 2004) and the abundance and distribution of this species is a good indication of condition and trend. I believe that this mussel bed should be observed to track status and trend every few years. Individuals are filter feeders and may accumulate contaminants more than many other aquatic invertebrates. They may also live for over a century so major population declines like that seen in the Middle Truckee River (e.g. from @10,000 to 150 individuals from 1940's to present) are of significance and concern.

Response 2.6: Thank you for the suggestion on monitoring the status and trend of *m. falcata* in the Truckee River. According to Herbst and Kane, *m. falcata* populations respond to changes in hydrology, as well as other water quality impacts including sediment supply. As such, it may be a good parameter for the Truckee River Operating Agreement's Biologic Resources Monitoring Program. We will forward your monitoring suggestion to them. If trend and status data do become available on *m. falcata*, Water Board staff could consider it as an additional indicator of general water quality in the Truckee River; however, we do not propose to use it as a sediment TMDL target because we do not have data linking it to excessive deposited sediment in the Truckee River.

Comment 2.7: In summary, the study by Herbst and Kane clearly demonstrated that the invertebrate communities of the Middle Truckee River are impacted and that they serve

as useful indicators to establish desirable sediment loadings to the system. Major improvements could be made by adjusting the timing and placement of sample sites, and reconciling problems with erosion modeling that complicate data interpretation because the model is unreliable.

Response 2.7: Comments noted.

<u>LETTER 3: Doug Praetzel, Sierra Pacific Industries</u>

Comment 3.1: Your own science doesn't indicate there is a sediment problem.

Response 3.1: We believe the scientific weight of evidence argues in favor of measures to control erosion and sedimentation, as outlined in the TMDL and responses to comments 1.2, 1.8, 1.12, and 1.15. Also, see comments 2.1, 2.6, 2.7. Further, our conclusions regarding sediment impairment were supported by two independent scientific peer reviewers.

Lastly, USEPA Region 9 reviewed the draft TMDL, and stated, "USEPA considers that the weight of evidence concerning sediment impairment, including information presented in the draft TMDL on suspended sediment and turbidity water quality data as well as biological monitoring results, supports the listing of the Truckee River between Lake Tahoe and the California-Nevada state line as water quality-limited, and the development of a sediment TMDL for this segment. Although consideration of only the 1969-2002 USGS grab sample turbidity data set at Farad might lead to the conclusion that the Truckee River at this location was not yet impaired during that period, EPA agrees that other information, including more recent continuous turbidity monitoring and suspended solids water quality data at Farad, as well as biological monitoring throughout the Truckee River watershed, supports the impairment determination."

Comment 3.2: This comment refers to statements on pages 3-7 of the draft TMDL regarding the long-term grab sampling record of turbidity compared to the mean of monthly mean turbidity WQO. Commenter states that "this is the longest data collection to date and results are within permissible parameters."

Response 3.2: In the context of the <u>historic grab sampling turbidity data only</u>, this comment is correct, and is consistent with the draft TMDL. Table 3-1 and the text immediately preceding it summarize the long-term grab sampling turbidity data, and conclude, "These data indicate that the WQO for turbidity is met at the Farad sampling station." Also, please see responses to comment 3.1, above.

Comment 3.3: This comment is regarding the short-term continuous sampling record of turbidity compared to the mean of monthly mean turbidity WQO. The commenter states: "This one years' worth of "questionable" data collection, when combined with the 30-year grab samples, increases the results to put it over your minimum specs. However, this type of data collection does not appear to be as trustworthy as the grab

samples. In your own words you state this. Why do you continue to use it in further analysis of the TMDL?"

Response 3.3: Please see responses to comment 1.2 and 1.17.

Comment 3.4: "For discussion purposes only". These results are used throughout the document also. Why are you using inconclusive data to formulate your TMDL?

This comment refers to the statement on page 3-10 of the draft TMDL:

> "Comparison of the SSC data to the benchmarks is useful for discussion purposes; however, the data are highly influenced by the timing and frequency of sampling.

Response 3.4: The statement referred to was included in the TMDL to give the reader an understanding of the issues we considered when analyzing SSC data. They were not intended to imply that the data are inconclusive. As the statement does not apply to the Farad sampling site, we will remove this statement to avoid confusion, as stated in response to comment 1.5.

Comment 3.5: What influence do Bronco and Gray creeks have on the Farad sampling point compared to tributaries further upstream? Are the allowable load excesses at the higher flows mostly attributed to Gray and Bronco creeks?

Response 3.5: Available sampling data for Bronco creek indicates that it is not a high-ranking load contributor to the Truckee River. For example, see Figure 3-3 and Table 3-5 of the draft TMDL, where the 90th percentile SSC value for Bronco Creek is 15.7 mg/L, and the load duration curve shows that even under higher flow conditions, Bronco Creek does not exceed aquatic life protection benchmarks. Also, Table 5-5 of the draft TMDL shows the relative SSC contributions from subwatersheds for above and below average water years. During above average year, Bronco Creek ranks seventh out of ten subwatersheds; during a below average year, it ranks the lowest sediment producer, at ten of ten.

Gray Creek, during an above average water year, ranks third in suspended sediment contributions to the Truckee, and during a low water year, ranks fifth (Table 5-5). Given its proximity to the Farad sampling site, it likely influences SSC values measured at Farad, even though it isn't the highest sediment producer even during above average water years. Authors of the DRI (2004) report observed that the higher suspended sediment loads at Farad are expected, given that it collects water and sediment from all the upstream subwatersheds with the Truckee River watershed, and it is a reasonable assumption that sediment from all subwatersheds affects loading at Farad, and not just Gray or Bronco creeks.

Comment 3.6: Targeted riffle samples occurred on the Truckee River, which, according to the researchers, is not ideal for assessment using this technique. However, this data is used in your conclusions and throughout document. Why is data not suited for collection used?

Response 3.6: The targeted riffle method was not the primary method used to collect bioassessment samples for the Herbst and Kane study; rather, the channel margin pump core samples were. Although the researchers did not feel the targeted riffle sample method was ideal for sampling the Truckee River, they collected these data as a secondary source of information on benthic communities in the Truckee River. It is not accurate to say that the data are unsuited for collection, but rather that they are not the ideal primary method for assessing a mainstem river such as the Truckee. This is why the pump core sampling method was developed.

Comment 3.7: The instream targeted riffle samples did not occur within tributaries shown on table 3-4.

Response 3.7: That is correct, as stated in the text immediately preceding Table 3-4 of the draft TMDL, "note that the BMI samples were collected from the Truckee River, but the results are reported relative to the nearest upstream tributary." This statement is also abbreviated in the table heading.

Comment 3.8: How can you conclude that the tributaries show these results (IBI scores) when they were never sampled? Why weren't other areas along the Truckee river sampled as well? Your hypothesis was never really proven because no other samples were taken where no tributaries were supposedly affecting the main channel.

Response 3.8: We do not conclude that the tributaries show the results in Table 3-4, as stated above. The results are for the mainstem Truckee River, but reported relative to the nearest upstream tributary.

Regarding "other areas" sampled along the Truckee River: samples were taken along the Truckee River at tributary confluences because the aim of the Herbst and Kane study was to characterize a "tributary-dependent sediment dose-response relationship in the middle Truckee River, if any" (Herbst and Kane 2006, page 15). Sampling where tributaries did not affect the main channel was not part of the study design.

Comment 3.9: Turbidity is a natural occurrence, not necessarily bad.

Response 3.9: Comment noted.

Comment 3.10: Why weren't Pole and Deep creeks included as tributaries instead of being lumped into intervening zones? It would have been interesting to compare data

from these relatively unmanaged watersheds without railroad or highway runoff influences to other watersheds.

Response 3.10: The DRI (2001) *Sediment Source Assessment* report evaluated loading from ten major subwatersheds in the Truckee River watershed. Part of this effort included developing regression equations to estimate sediment loading from flow and SSC records. We used these regressions to estimate loading from each subwatershed. DRI did not include Pole and Deep creeks in its analysis, because no sediment loading or flow data were available for these areas, so no regressions could be developed. Therefore, we had to include these subwatersheds in the "intervening zone and unmeasured inputs" category.

Comment 3.11: Unable to find in document where natural vs. man-made turbidity is dissected.

Response 3.11: Please see Figure 5-6, and the discussion on pages 5-17 through 5-19 of the draft TMDL for how the percent "controllable" sources for each subwatershed were determined. We defined "controllable" sources as those associated primarily with human activity which will typically respond to mitigation, restoration or improved management activities (p. 5-1 of the draft TMDL). We estimated the percentage of controllable sources in each subwatershed based on the presence and extent of urbanized areas, dirt roads, ski areas, and legacy sites.

Comment 3.12: Who determines what desired conditions are?

Response 3.12: The Water Board establishes desired conditions when they adopt the TMDL. A numeric desired condition for SSC is described in the TMDL. For the other targets (dirt road maintenance or decommissioning, ski area BMP implementation, legacy site restoration, and road sand tracking and recovery), no quantitative targets are set, and the desired conditions correspond to compliance with sediment and erosion control permit provisions, Basin Plan regulations, and Water Board orders.

Comment 3.13: If you are not concerned with numeric targets, how can you say there is a problem with sediment (your data proves there is no problem)? Why go to all the trouble and cost to study sediment loading when your results disprove it and you will not use this data to measure the "success" of your future efforts to reduce TMDL?

Response 3.13: As outlined in the response to comment 3.12 above, we are concerned with targets; however, we do not propose to track numeric mass sediment loading (e.g., tons/day), but rather, permit compliance (for the implementation activity targets) and SSC levels. We disagree that our data "proves there is no sediment problem", as outlined in response to comment 3.1.

Lastly, sediment loading is described because it is required by the USEPA to quantitatively provide estimates of sediment loading, needed reductions and allocations. The estimates are useful to give a relative understanding of the location and magnitude of sediment sources throughout the watershed. Please see responses to comments 1.21 and 1.22 for details on calculating the loading reduction based on the SSC target.

Comment 3.14: The time periods during which excessive sedimentation occurs are during high flows. Have you compared this data to other (non-TMDL) watersheds? One would surmise that a watershed at high flows has greater sedimentation levels when compared to low flows.

Response 3.14: The commenter is suggesting the use of a "reference watershed" (non-TMDL watershed). A reference watershed must be reasonably similar in size, location, geology, vegetation, etc., to the Truckee, but with minimal disturbance from anthropogenic sources. Such a watershed was not identified for this TMDL. In general, the statement that high flows contribute more sediment than low flows is correct.

Comment 3.15: What percentage of time is the lower Truckee within its "limits" using the original Farad data? This seems to be a goal that is impossible to obtain. High flows (rain on snow events, severe summer thunderstorms) result in much more "natural" sediment runoff than would spring thaws and normal rain events in the fall. Was this a consideration in your data collection?

Response 3.15: According to Figure 3-2 in the draft TMDL, about 60 percent of the flows observed, SSCs are within the target limits. In the flow ranges where the target is exceeded, five percent of the measured SSCs exceed the target. As shown in table 4-2, assessing the 90th percentile annual value of SSC shows that about 78 percent of the years for which data are available meet the target. This does not suggest that the target SSC is an impossible goal to attain.

Regarding data collection during periods of high flow versus base flows: the grab sampling data for SSC at Farad was generally collected at fixed time intervals (e.g., once per month) and was not targeted toward any specific flow regime. There were some periodic exceptions to this, when sampling was conducted specifically to target higher flow conditions (e.g., the DRI 2004 SSC/turbidity study, which attempted to quantify sediment "events" in the watershed.

Comment 3.16: Your historical "data" for listing includes:

- 1990 Department of Fish and Game memo
- Complaints related to sediment discharge
- Sediment related violations

- Sediments from Gray and Bronco creeks during summer thunderstorm events (these are both undeveloped watersheds-road legacy issues only.)

None of these reasons are compelling to list. It would seem wiser to de-list and put efforts into cleanup using the regulations you have in place now while continuing to monitor (outside agencies currently already monitoring).

Response 3.16: The data cited above is the original information which led to the inclusion of the Truckee River and Gray and Bronco Creeks on the 303(d) list of impaired waters in 1992. At that time, there was no policy for data quantity or quality used to list a waterbody. Therefore, some listing decisions were not based on robust quantitative data, but on narrative information such as that listed above.

In 2004, the State Water Board adopted the *Water Quality Control Policy for Developing California's 303(d) List*. This policy outlines decision rules for evaluating data, including data requirements and exceedance criteria for listing and de-listing. To remove the Truckee River from the 303d list, it would have to meet the criteria set forth in Section 4 of the Policy (California Delisting Factors). For sediment impairments, the most applicable factors are outlined in Sections 4.8 (Adverse Biologic Response), 4.9 (Degradation of Biologic Populations and Communities) and 4.11 (Situation-Specific Weight of Evidence). These factors require findings to be made that adverse biologic response or degradation is not evident in the water body, or that the weight of evidence provides a substantial basis in fact such that the Water Board could reasonably infer that current conditions justify delisting.

Our analysis presented in the TMDL shows degradation of biological communities, and the weight of evidence does not provide a substantial basis to reasonably infer that conditions justify delisting. Therefore, delisting is not the appropriate action as suggested, and we believe the weight of evidence argues more strongly for TMDL development, as presented in section 3 of the draft TMDL. This decision was supported by independent scientific peer review and the USEPA (see comment letter 10).

Regarding the suggestion to put efforts into cleanup using the regulations we already have: this is consistent with the strategy outlined in the TMDL implementation plan. TMDL implementation is ongoing through the regulatory tools outlined in Section 10 of the draft TMDL. Efforts to reduce erosion and sedimentation to surface waters in the Truckee River watershed have been occurring through issuance of WDRs, conditional waivers of WDRs, enforcement actions, and Water Board support of grant funding proposals and voluntary efforts.

Comment 3.17: What changes in regulations/mitigations can the "dischargers" expect from implementation of the TMDL versus what is currently in place?

Response 3.17: Please see response to comment 3.12 and the last paragraph of response 3.16. In general, the TMDL will be implemented by the existing permits, waivers and regulations. If, in the future, new sources of sediment discharges become apparent, they would be subject to the regulations that are in place to mitigate sediment discharges.

Comment 3.18: Comparing ski area traffic (1.6 million visitors) to Arizona park visitors is a poor analogy. Different climates, soils, time of year, etc. It makes it look pretty bad on our end when only 50,000 visitors can cause "polluted runoff".

Response 3.18: The statement in the draft TMDL comparing ski areas visitors to tourism numbers in Arizona was included to give the reader a sense of context for the 1.6 million ski area visitor days in the Truckee River area. We agree that the differences between the areas diminish the usefulness of the comparison, and will remove it.

Comment 3.19: Slopes greater than 15% are ranked in the high to very high erosion category. How was this calculated? 15% is not very steep.

Response 3.19: The slope data came from the California Rivers Assessment (CARA) database. Slope gradients for the CARA database were generated by using the 'slope' function in ARC/INFO GRID on a 3-arc-second Digital Elevation Model of the State of California. According to the US Soil Conservation Service, "strongly sloping" gradients are defined as 12 to 18 percent slope. However, the erosion category rankings were assigned based on slope as well as precipitation, soil type and ground cover (TRWC, 2002). We will change the text to clarify this.

Comment 3.20: How can SSC be more at downstream locations? Wouldn't some settling occur?

Response 3.20: Higher suspended sediment concentration or loads at Farad are to be expected, given that this location collects water and sediment inputs from all the upstream subwatersheds within the Truckee River watershed (DRI, 2004). Suspended sediment is that portion of the total sediment load of rivers that is carried in the water column. Typically, much of the measured SSC is comprised of the silt/clay or colloidal fraction that will be transported through a reach without being deposited. However, at low flows, some of this transported material would drop out of suspension.

Comment 3.21: Do Gray and Bronco creeks have a greater influence on sediment production than upstream locations? Both of these watersheds have legacy road issues and most recently, the Martis fire.

Response 3.21: Regarding Gray and Bronco creeks and their influence on sediment production, please see response to comment 3.5. The issues of legacy

roads and the impacts of the Martis fire on both watersheds are described in the draft TMDL (see the Problem Statement sections on these subwatersheds, pages 3-16 to 3-22).

Comment 3.22: Thunderstorms, snowmelt and dam releases. How much "natural" sediment occurs during these events?

Response 3.22: The DRI (2004) report did not quantify natural versus human-caused sediment due to these types of sediment loading events. For accounting purposes in the load allocation section, the controllable portion of the load due to these events was estimated by Water Board staff at 40 percent (i.e., the "medium" controllable load ranking). This value was chosen because event-based loading is assumed to come from all sources (both natural and human-caused, including in-stream erosion); therefore the "medium" ranking reflects some uncertainty in control options (page 7-3 of draft TMDL).

Comment 3.23: Your conclusion is based on data you did not find conclusive.

Response 3.23: Please see responses to comments 3.1, 3.4, 3.6, 1.2, 1.8, 1.12, 1.13, and 1.15.

Comment 3.24: Your method of study (i.e., targeted riffle samples) was not the preferred so the results and your conclusions will be difficult to regard as conclusive.

Response 3.24: Please see responses to comments 3.1, 3.4, 3.6, 1.2, 1.8, 1.12, and 1.15.

Comment 3.25: "More effective actions" appear to be more regulations and additional mitigation for future projects. Since you have not been specific on either, it leaves the private (and public) land manager, developers, etc. with no way of knowing costs of future projects from additional mitigation and/or regulation put into place by your agency.

Response 3.25: Regarding additional regulation and mitigation measures to implement the TMDL, please see responses to comments 3.12, 3.15, and 3.16. Regarding specifics on mitigation for future projects, the Water Board cannot specify the design, location, type or particular manner of compliance with the TMDL (California Water Code Section 13360). However, in the California Environmental Quality Act (CEQA) document prepared for this TMDL, we outline foreseeable actions that may be implemented to control sediment and erosion and estimate the costs of these actions. These estimates are provided in Table 1 of the CEQA document.

Comment 3.26: You seem focused on the development activities within the watershed being main contributors to the sediment or potential sediment problem. Any current development must abide by permits obtained by your agency. How will this TMDL

affect future development? Will this create more regulation? If not, why is this TMDL necessary if nothing will change?

Response 3.26: The statement that development activities are described as the *main* contributors to the sediment problem is not correct. The TMDL Source Assessment estimates that sediment contributions from urbanized areas make up about 10 percent of the total loading measured at Farad. The other 90 percent is estimated to come from "non-urban" areas, which include dirt roads, non-urban legacy erosion areas, ski runs and natural background sedimentation.

It is correct that future development must comply with existing regulations, including those from the Water Board, local agency or other requirements. For example, the Town of Truckee has adopted an erosion prevention standard for one- and two-family residential construction projects. Placer County has adopted a storm water quality ordinance in 2006, and has updated erosion and grading control ordinances that apply to new development. Generally, many of the regulations to control erosion and sedimentation related to development are already in effect as of 2006. The TMDL is not a land use planning document, and as such, will not directly affect or limit future development.

Regarding the necessity of the TMDL: this is a broad-scale planning document that identifies the areas and land uses on which implementation actions should focus. It also provides a compilation of available data and analysis of the conditions that require attention. This information is then used to guide regulatory approaches and implementation activities. For example, dirt roads, legacy sites and urban areas were identified as the priorities for implementation in this watershed. Therefore, available resources will be focused on these areas, including regulatory oversight of dirt road maintenance, permitting and management of existing and future municipal storm water discharges, funding for the USFS OHV management, and funding for legacy site restoration.

Comment 3.27: Legacy land use impacts can be corrected as well as road drainage problems. You list no specific sites that are contributors.

Response 3.27: We do not provide a listing of specific dirt roads or legacy land use impacts that need to be corrected, because for most areas, that type of detailed information is unavailable. In the Source Assessment, we summarized the general information known about legacy sites for each subwatershed in Table 5-4. Specific sites that need attention will be identified through watershed assessments (such as those done for Gray and Donner/Cold creeks watersheds), through annual worklists submitted to fulfill WDR requirements, Timber Harvest Plans, or Water Board staff inspections or complaints.

Comment 3.28: In these uncertain economic times, do not enforce unnecessary and costly regulation/mitigation where less expensive methods can be used. If the TMDL is

made effective, this document appears to give a broader range of powers to your agency.

Response 3.28: We do not agree that the TMDL constitutes costly and unnecessary regulation. The methods used to implement the TMDL are the same as those used to carry out our obligations to protect and maintain water quality using our existing regulatory authority. The TMDL does not give our agency any additional powers or authority.

Comment 3.29: Think of your actions to protect a river system in economic terms, not just environmental. The TMDL has no economic impact section. While it is your duty to enforce the laws of California, it is also imperative that these efforts be carried out in a manner that both protects the waters of the state and protects the pocketbooks of companies and individuals from unnecessary mitigation.

Response 3.29: The economic analysis describing potential costs to implement the TMDL is contained in the CEQA "substitute" environmental document. Please see Table 1 this document.

<u>LETTER 4: Lisa Wallace, Truckee River Watershed Council</u>

Comment 4.1: The Truckee River Watershed Council supports the decision of the Lahontan Regional Water Quality Control Board to develop the middle Truckee River TMDL.

Response 4.1: We appreciate the support.

Comment 4.2: A significant portion of the implementation and monitoring measures focus on issuance and compliance of permits, with limited focus on effectiveness or impact to impairment. In other words, the focus is on compliance with existing programs and permits, not on the effectiveness of the programs or permits in reducing impairment (or improving watershed conditions or beneficial uses). What is proposed is not likely to generate sufficient data to substantiate results or trends toward or away from the TMDL objectives and targets. We request a monitoring plan to address effectiveness of activities and impact on impairment, watershed conditions and beneficial uses.

Response 4.2: We agree that additional monitoring plans tracking watershed activities and effectiveness are needed. The Water Board has already required comprehensive watershed monitoring plans be prepared by Placer County and the Town of Truckee (due July 2008). We encourage your participation in the County and Town's efforts to develop its watershed monitoring program. Water Board staff is also working with the Tahoe National Forest on reporting its annual progress on completing watershed improvements. Other facilities under individual permits must submit monitoring reports that describe the

implementation and effectiveness of improvements and in some cases, require water quality monitoring.

The Target Monitoring Plan was revised to identify additional information (other NDEP Truckee River monitoring sites and municipal monitoring program in development) that could be used to help assess source areas if adverse conditions are indicated by the sampling results at Farad. Additionally, the effectiveness of on-ground controls implemented at source areas (road sanding, ski areas, dirt roads, and legacy sites) can be evaluated based on the results of annual site reviews as they are tracked over time. For example, the effectiveness of erosion control activities on graded ski runs can be evaluated based on the extent of gullies and rills observed from year to year. If persistent problems are identified, alternative management approaches can be implemented to increase long-term effectiveness. Thus, compliance with permit conditions is useful for tracking improving watershed conditions.

Comment 4.3: This section lists several entities under permit (Tahoe Donner Maintenance Facility, Truckee Tahoe Airport District, Tahoe Truckee Sanitation District, Teichert Aggregates and Hobart Mills Material Processing Facility). We are not sure if this list is meant to be comprehensive. If so, there are several entities to be considered to be brought under this permit including but not limited to Union Pacific Railroad (transportation), Tahoe Truckee Unified School District (transportation and significant area of impervious surface), Eastern Regional Materials Recovery Facility (disposal site), the Truckee Fire Protection District (transportation), and Truckee Donner Recreation and Parks District (transportation). This should be addressed in a "recommended focus area" for Statewide General NPDES Permit for Industrial Storm Water Discharges.

Response 4.3: The list is meant to be comprehensive, but we note that the Eastern Regional Landfill in the Cabin Creek subwatershed (included in the Intervening Zone/Unmeasured Inputs category) was inadvertently left off. We will list them as an enrolled discharger under the Statewide General NPDES Permit for Industrial Storm Water Discharges, and add a recommendation to identify and enroll other eligible industrial storm water dischargers as resources allow.

LETTER 5: Pat Davison, Contractor's Association of Truckee Tahoe

Comment 5.1: p. 2-4 - Current Development - "High" as a description of growth is not defined; when contrasted with growth rates from the 1970's and 1980's, current figures show a dramatic decrease; second home residency means that impacts are less than what would be expected; development that occurred in the 1960's to the 1990's did not have, for the most part, sophisticated water quality measures incorporated into plans. The point is that today's growth activity is different from previous years and some qualifying statement could be added to make this description and subsequent descriptions more accurate for the reader.

Response 5.1: The comment pertains to a general statement in the Background section of the TMDL. The statement refers the reader to a more detailed discussion later in the document (Section 3.2.2) where the nature and rate of growth is discussed. The growth rate is used in conjunction with other conditions to describe the overall activities that have the potential to be sediment sources. It is accurate to state that both past and future development activities are considered potential sediment sources.

Comment 5.2: p. 2-5 - Map doesn't show all Donner State Park holdings? Is Martis Creek Lake federally owned? Land owned by Special Districts (Recreation & Park District, Airport District, TTSA, etc.) is shown as private but could be shown in a separate category for better understanding. Truckee Donner Land Trust has significant holdings and there may be value in showing their owned or controlled lands for purposes of this map.

Response 5.2: The purpose of the map was to give the reader an idea of the general land ownership in the watershed and to supplement the discussion of the general land uses. We feel it provides sufficient detail for these purposes.

Comment 5.3: p. 2-11- Please state who owns Martis Creek Reservoir for consistency with the other paragraphs.

Response 5.3: The report will be revised to state that Martis Creek Reservoir is owned and operated by the U.S. Army Corps of Engineers.

Comment 5.4: p. 3-4- Current Conditions - Again, the generalization about "significant growth and development" seems misleading. Actual numbers that show a span of time (40 years) may provide the reader a better contextual feel for the issue.

Response 5.4: See response 5.1. The 10-year time span is considered sufficient to describe growth rates relevant to this TMDL. This is the same criteria used by the State Water Resources Control Board to identify high growth areas that may be subject to municipal storm water regulatory controls.

Comment 5.5: p. 3-5 - Do the numbers presented for the "current Martis Valley General Plan" include the residential reductions resulting from the purchase of the Waddle Ranch or legal settlements?

Response 5.5: The numbers presented in the report are based on the citations provided in the report and are dated 2003 and 2004. Revisions taking effect after these dates would not be reflected in the numbers reported in the report.

Comment 5.6: p. 3-5 - It might be helpful to add a statement to indicate that Truckee is more than halfway to buildout. These sentences are taken from the Town's 2007 Annual Report, dated March 13, 2008 (May be accessed from the Town's website):

p.4 "The Town is currently at 60% of non-residential buildout. Upon completion of all residential units under construction or approved, there will be 12,252 residential units, which is 62% of residential buildout."
p.8 "The Town is currently at 66% of non-residential buildout. Upon completion of all non-residential floor space under construction or approved, the Town will be at 79% of non-residential buildout."

Response 5.6: We understand that more recent information and data will become available during the time that the TMDL process moves forward. However, in order to complete the report, there must be a cut-off point on which to base our analysis. The source assessment data is based on the water years 1996-1997 and 2003-2004. Therefore, the land use information presented in the report is consistent with the time frames analyzed in the source assessment.

Comment 5.7: p. 3-5 - Reference to an "undated" USEPA source has questionable value and should be removed. Please keep in mind that disturbance that is mitigated deserves differentiation from disturbance that is not. Blanket statements as presented here about runoff invite clarification.

Response 5.7: Please see response to comment 3.18. The report will be revised as suggested.

Comment 5.8: p. 3-6 - Elevated turbidity levels affecting TMWA were a result of Gray and Bronco Creeks, not upstream activity. Please add a phrase to clarify.

Response 5.8: We will add a statement regarding reports of Gray and Bronco creek's influence on TMWA operations; however, it is still correct to state that land disturbing activities in erosion-prone areas have the potential to discharge sediment-laden runoff to waterways, which is the point of the paragraph in question.

Your comment implies that the elevated turbidity at TMWA was due <u>solely</u> to Gray and Bronco creeks. To clarify, we do not know to what extent subwatersheds upstream of Gray and Bronco creeks may have contributed to the elevated turbidity at TMWA, but it is unlikely that the high turbidity can only be attributed to those two creeks (please see responses to comments 3.5 and 3.21 regarding Gray and Bronco creeks).

Comment 5.9: Other accompanying documents - Although we are disappointed to see that a collaborative effort was not pursued to create the TMDL plan, we are pleased to see emphasis on adaptive management (see Draft SED p.5). The draft Basin Plan amendment notes on page 3 "Progress toward meeting the targets will be evaluated by Water Board staff on an annual basis. After 10 years (the halfway point estimated for TMDL attainment), staff shall examine…)". It is a little confusing to see the reference to adaptive management and annual evaluation but the actual timeframe for revising the plan appears to be 10 years from the Plan adoption. Please add some language to

indicate how warranted changes could be made before the 10 year halfway point is reached.

Response 5.9: The report will be revised to address the comment. In general, permitted facilities/land uses will be evaluated on an annual basis and adaptively managed to reduce erosion and sediment runoff. This evaluation will be site-specific and will be based on the effectiveness and completeness of control actions taken to comply with permit conditions. After ten years, staff will evaluate compliance with permit conditions on a watershed basis in conjunction with an evaluation of the SSC data to assess whether the targets and implementation are sufficient or need to be revised.

Comment 5.10: Other accompanying documents - We are grateful for the "Estimate of Possible TMDL Implementation Costs" (Draft SED, pages 6-8). This information not only adds to the body of knowledge available to the public and decision makers but also brings the abstract of the TMDL plan to reality in attempting to identify who has to pay and at what cost for the desired action.

Response 5.10: No response required.

LETTER 6: Krista Coulter, State of Nevada Clearinghouse

Comment 6.1: The State Clearinghouse has processed the proposal and has no comment.

Response 6.1: No response is required.

Letter 7: G. Scott McGowen, California Department of Transportation

Comment 7.1: The iterative framework described in the TMDL needs specific, more frequent checkpoints to assess the impairment of the Middle Truckee River. Based on a limited review of available documents, we are concerned about the basis for the 303(d) listing of the Middle Truckee River as impaired for sedimentation. Specifically:

- The California Department of Fish and Game (DFG) memorandum provides no documentation or data to support its description of the Truckee River as having the problems of "substrate loss to siltation" (SS), "substrate loss to removal or lack of recruitment" (SR), and "loss of (adult) holding areas" (HA).

Response 7.1: The data cited above is the original information which led to the inclusion of the Truckee River and Gray and Bronco Creeks on the 303(d) list of impaired waters in 1992. At that time, there was no policy for data quantity or quality used to list a waterbody. Therefore, some listing decisions were not based on robust quantitative data, but on narrative information such as that listed above (please see response to comment 3.16 for a discussion on 303(d) listing issues).

Comment 7.2: The 2006 Herbst and Kane bioassessment study was inconclusive with regard to whether "the measured sediment volumes can be termed excessive" (p. 3-14). In addition, one of the bases for the TMDL development (p. 3-15, item 3) refers to the bioassessment techniques, which "are not ideal for assessing the Truckee River" (p. 3-13). Thus, given that this assessment method was not optimal and that the findings regarding excessive deposited sediment were inconclusive, we suggest that the bioassessment results be interpreted more carefully prior to being used as a basis for TMDL development.

Response 7.2: The bioassessment data <u>was</u> considered carefully, as indicated by the full discussion of the study's attributes and drawbacks. The information was considered along with the other available data, and the weight of evidence supported the decision to prepare a TMDL. This conclusion was further supported by two independent scientific peer reviewers. For additional discussion on the bioassessment study and its use in TMDL development, please see responses to comments 1.8, 3.1, and 3.6.

Comment 7.3: The SSC data (Truckee River at Farad) have been interpreted in several different ways with respect to the TMDL compliance targets:

- In Table 3-3, it is reported that of the 434 samples collected between 1/1/1975 and 8/14/03, 8% (approximately 35 samples) were greater than 25 mg/L (p. 3-9).

- In Table 6-1, it is reported that of the 200 samples collected during "high flows" periods (above 556 cfs), 15% (30 samples) exceed 25 mg/L, which is 5% above the 10% compliance target (p.6-2). This analysis suggests that the Truckee River is close to compliance with the target, so obvious problems (e.g., legacy sites) should be prioritized for resolution during the first five to ten years of TMDL implementation, rather than burdening stakeholders with large and expensive projects.

Response 7.3: We agree. The Implementation section calls for permitted dischargers to identify legacy sites or other erosion problems such that corrective actions can be taken as funding and priorities allow.

Comment 7.4: In Table 6-1, it is reported that of the 90th percentile values for annual data (all years), 6 out of 27 years (22%) were not in compliance (p. 6-2). It is unclear when these annual exceedances occurred. In addition, the title of Table 6-1 describes the data as ranging from 1975 to 2006, which would be equivalent to 31 years of data. If the 1975 to 2003 data were used (as listed in Table 3-3), this would be equivalent to almost 28 years of data. A clarification of the calendar years for which data were analyzed is requested. In addition, time-series plots of the Truckee River flow and SSC data that are summarized in Table 3-3 and used for Figure 3-2 is requested.

Response 7.4: The years that the 90th percentile values exceeded 25 mg/L are presented in Table 4-2. The data in Table 6-1 includes water years 1975-1976 through 2004-2005, 27 water years. The report will be corrected accordingly. The data presented in Table 3-3 is a compilation of all data and the date range that samples were collected. They are not necessarily correlated to water years. The date range for the Farad site in Table 3-3 should be through 9/13/05 and will be corrected. Data for the Farad site, shown in Table 3-3 and Figure 3-2, are available in spreadsheet format and will be provided as requested.

Comment 7.5: We suggest that the Regional Board use a stronger, iterative framework given the questions regarding the classification of the Middle Truckee River as impaired. This is not to say that the Department will not work with the Regional Board to address sediment; on the contrary. The Department takes numerous measures to control sediment from roadways and fully intends to work with the Regional Board to attain the best water quality in the watershed. However, we wish to ensure that there is adequate opportunity to verify the proper course of action and BMP implementation. In particular, we wish to see a more detailed timeline for evaluation incorporated into the TMDL, along with a detailed strategy for implementing alternative control measures should the efforts under the TMDL not resolve the water quality impairment.

Response 7.5: Implementation of the TMDL will follow an iterative process in which erosion sources are identified and mitigated on an ongoing basis. This will be accomplished under the regulatory and voluntary actions described in Section 10.3, and described in response to comment 3.12. Specific actions will be determined as needed on a case by case basis depending on individual site conditions. Regarding a more detailed timeline for evaluation, please see response to comment 7.6. We are unclear what specifically is meant by "alternative control measures", and so cannot provide a detailed strategy for implementing them.

Comment 7.6: The following issues should be addressed.

- Evaluate the TMDL every five years, rather than after 10 years (the halfway point estimated for TMDL attainment).

Response 7.6: The numeric target and the implementation indicators will be evaluated annually as stated in the TMDL. After ten years, the effectiveness of the overall program will be evaluated to determine whether revisions to the targets and implementation plan are warranted. Since the regulatory programs that implement the TMDL are generally already in place, the annual reviews will primarily consist of assessing discharger compliance with permit conditions and commitments made by other public or private entities. For the numeric SSC target, sufficient data will need to be collected to assess in-stream response to the implementation actions taken. The ten-year period is appropriate for this purpose. Additional discussion will be included in Section 10.5 of the TMDL to address this comment.

Comment 7.7: Clearly specify what data (i.e., data collected beginning after TMDL adoption) will be evaluated for compliance with the TMDL.

Response 7.7: The data and information that will be evaluated are presented in Table 10-2. Further, additional detail will be added, as stated in the response to comment 7.6.

Comment 7.8: Provide specific questions that will be asked and addressed during evaluation of the TMDL in the event that the Middle Truckee River fails to meet the Water Column Target after five-, ten-, and 20-year increments. For example, on p.5-1, it is stated that "unmeasured inputs include…in-stream erosion in the Truckee River." If, after five years, the Truckee River fails to meet the Water Column Target, in-stream erosion (or stream bed/channel erosion) is something that could potentially be considered as a source of suspended sediment concentration (SSC).

Response 7.8: Examples of issues to consider during the evaluation of the TMDL will include:

- **What precipitation rates and types occurred over the evaluation period?**
- **Were there sampling or data collection problems?**
- **To what extent did dischargers comply with their permit conditions?**
- **Was progress made on restoring legacy sites during the evaluation period?**
- **Were dirt road management plans implemented and monitored?**
- **Were road sand management activities appropriate relative to the water year?**
- **Are there other sources that could be affecting water quality conditions?**

Additional discussion will be included in Section 10.5 of the TMDL to address this comment.

Comment 7.9: Provide a framework for reevaluating and adapting the TMDL based on findings from periodic review. For instance, it is envisioned that the implementation actions of addressing legacy sites will bring the river into compliance with the target. If the river attains the target, then no further activities would be required.

Response 7.9: See responses 7.5 and 7.8 about evaluating and adapting the TMDL. To clarify your statement about legacy sites, we envision that reducing sediment from each of the identified controllable source categories (not just legacy sites) will bring the river into compliance with the target. It is not correct to state that once the river attains the target, no further activities would be required. For example, implemented BMPs must be maintained, new erosion sites identified from season to season must be addressed, etc.

Comment 7.10: It is suggested that the TMDL Target Monitoring Plan include more frequent sampling for the suspended sediment concentration (SSC) at Farad. Within

the TMDL, it is stated that SSC data "are highly influenced by the timing and frequency of sampling" (p. 3-10). According to the TMDL Target Monitoring Plan (Table 10-2, p. 10-15), SSC monitoring at Farad takes place "generally monthly". Both the representativeness of the samples (timing) and the total number of samples required to be collected annually (frequency) are of concern.

- Timing: In reviewing Figure 3-2, it appears that more samples were collected at higher flows, which could result in more observed exceedances at higher flows. This supports the idea that more data points should be collected to represent a variety of conditions and more accurately assess whether or not exceedances correlate with greater precipitation and/or higher flows.

Response 7.10: Samples were collected fairly evenly across the range of observed flows at Farad. Figure 4-1 presents a bar chart showing the number of samples collected within each flow quartile.

Comment 7.11: Frequency: Monthly sampling to assess annual compliance with the Water Column Target may lead to biased data, as only 12 data points will be collected annually. We understand that the 12 data points will be evaluated based on the 90th percentile SSC value for that year; however, if just one sample is greater than or equal to 25 mg/L, 8.3% of the data will be out of compliance; if two samples are greater than or equal to 25mg/L, 17% of the data will be out of compliance.

Thus, in order to obtain an appropriate number of data points collected during representative conditions, it is suggested that more frequent, regular (i.e., weekly) sampling be conducted in the Truckee River at Farad by the Desert Research Institute.

Response 7.11: We agree that more frequent sampling is desirable. However, the current program in place is consistent with the data used in the TMDL analysis, and has secure funding. We will support additional funding to enhance the sampling frequency as opportunities arise. Additionally, the Water Board may require dischargers to contribute to monitoring if, for example, if funding cuts impact the existing monitoring program run by Nevada Department of Environmental Protection.

Comment 7.12: Has consideration been given to any natural background loading? Has a distinction been made between legacy site loading and natural background loading?

Response 7.12: An evaluation of controllable and non-controllable sources is presented in Section 5.4. (Effects of Land Characteristics). Non-controllable sources are equitable with natural background loading and no load reductions are expected from non-controllable sources. The extent of legacy sites, as well as dirt roads, urban areas, and graded ski areas (controllable sources) was estimated for each subwatershed.

Comment 7.13: How will legacy restoration, including site identification and prioritization, be implemented?

Response 7.13: Many legacy sites have already been identified by the Truckee River Watershed Council and the Truckee Donner Land Trust. Other sites have been identified by dischargers (e.g., Town of Truckee) in the watershed. Priority projects are identified by involved stakeholders and are evaluated for funding under State Water Resources Control Board grant programs. We expect identification of legacy sites to be an ongoing process such that specific projects may be proposed when funding opportunities are available.

Comment 7.14: Specific comments:

The numeric Water Column Target should be an approved Lahontan Basin Plan objective. Within Section 2.3, "Applicable Water Quality Objectives" (p. 2-12), it is stated that "the majority of sediment-related water quality objectives are expressed in *narrative* form, based on the protection of beneficial uses" (emphasis added). For the purpose of this TMDL, the desired conditions for the protection of aquatic life are represented by a *numeric* target. For determining the TMDL, the Water Column Target for the suspended sediment concentration in the Truckee River at Farad is a numeric objective that will be evaluated in two ways: (a) the annual water year 90th percentile SSC value should be less than or equal to 25 mg/L, and (b) fewer than 10% of the SSC values during high flow periods (above 556 cfs) should be greater than 25 mg/L (Table 6-1, p. 6-2). This numeric target should be subject to Porter-Cologne considerations and be incorporated into the *Water Quality Control Plan for the Lahontan Region: North and South Basins* as an approved objective for the Middle Truckee River at Farad.

Response 7.14: To clarify the comment on evaluating the target, the SSC target will be evaluated relative to an annual water year 90th percentile value of 25 mg/L. The comparison of SSC during high flow periods was intended to assess the range of load reductions that may be required, but in the end, we based the reduction on the annual comparison only. Table 6-1 and the explanatory text following it will be clarified to reflect this.

Regarding comments on establishing the target as a Water Quality Objective, TMDLs require a quantitative numeric target necessary to implement existing water quality standards. In this case the numeric SSC target interprets the narrative sediment objective in the Basin Plan. There is no requirement to establish the numeric target as a water quality objective.

Comment 7.15: The "Current Conditions" for major highways should be updated. The estimated annual average daily traffic for Interstate 80 through the Truckee Corridor is based on the *2005 Traffic Volumes on the California State Highway System* report (p. 3-5). The *2006 Traffic Volumes on the California State Highway System* report has been published, and these updated values should be included within the TMDL.

Response 7.15: The current conditions discussion will be updated as suggested.

Comment 7.16: The sediment loading values in Table 5-3 and 5-6 should be reviewed for calculation errors. As an example, in Table 5-3 (p. 5-14), the sediment loading for urban areas in the Little Truckee subwatershed is incorrectly listed as 2 tons. This value should be 0, since the urbanized area in this subwatershed is 0%. In Table 5-6, the loading for urban areas in the Little Truckee subwatershed is listed correctly as 0 tons.

Response 7.16: Comment noted. The error in Table 5-3 will be corrected.

Comment 7.17: The language describing the Department's permit (p. 10-6) should be modified. Under Section 10.3, "Sediment Control Programs" (p. 10-6), the language for "Snow and Ice Control" references the Department's permit as follows:

> "During the 2007 update of the Caltrans permit, Water Board staff submitted comments to the State Water Board to revise the permit to include reporting requirements for this information."

The above language should be modified to reflect the fact that the Department's permit is currently under negotiation, and the permit update did not occur in 2007.

Response 7.17: The language will be revised as suggested.

<u>Letter 8: Terry Roberts, State of California Clearinghouse</u>

Comment 8.1: Acknowledges that the Water Board complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to CEQA. One comment letter from the Native American Heritage Commission is enclosed.

Response 8.2: No response is needed.

<u>Letter 9: Katy Sanchez, Native American Heritage Commission</u>

Comment 9.1: The Native American Heritage Commission (NAHC) has reviewed the Notice of Completion for the Truckee River TMDL for Sediment. To adequately assess and mitigate project-related impacts to archaeological resources, the NAHC recommends several actions (see the NAHC letter in Attachment 1 for the complete list of recommendations).

Response 9.1: Thank you for the guidance to assess and mitigate project-related impacts to archaeological resources. As stated in the CEQA substitute environmental document (SED) for this TMDL, the CEQA analysis provides a general program level, or Tier One analysis (Public Resource Code [PRC] 21159(a)(1-3)) of reasonably foreseeable methods of compliance with the TMDL.

A subsequent project-specific, or Tier Two analysis, must be done by project proponents for specific sediment control projects to comply with the TMDL (PRC 21159.2).

However, in the environmental checklist section of the SED (Cultural Resources evaluation), we included the recommendations provided by the NAHC to mitigate potential impacts to archaeological or cultural resources.

Letter 10: Jack Landy, USEPA

Comment 10.1: EPA considers that the weight of evidence concerning sediment impairment, including information presented in the draft TMDL on suspended sediment and turbidity water quality data as well as biological monitoring results, supports the listing of the Truckee River between Lake Tahoe and the California-Nevada state line as water quality-limited, and the development of a sediment TMDL for this segment. Although consideration of only the 1969-2002 USGS grab sample turbidity data set at Farad might lead to the conclusion that the Truckee River at this location was not yet impaired during that period, EPA agrees that other information, including more recent continuous turbidity monitoring and suspended solids water quality data at Farad, as well as biological monitoring throughout the Truckee River watershed, supports the impairment determination.

The evaluation of suspended sediment data based on the judgment that 25 mg/l TSS/SSC (as a 90th percentile of annual datasets) causes adverse impacts to aquatic life is consistent with EPA guidance and the preponderance of information concerning aquatic life impairment. Of the 27 years for which SSC data are available, this target value is exceeded six times (over twice the 10 percentile allowable). Furthermore, if the first and second halves of the dataset are considered, there are twice as many years in exceedance in the more recent half than in the first half of the period of record.

Furthermore, this numeric target is consistent with applicable water quality standards for total suspended solids adopted by the State of Nevada for the Truckee River just downstream of Farad.

Response 10.1: We appreciate US EPA's support.

United States Department of Agriculture
Forest Service
Tahoe National Forest

631 Coyote Street
Nevada City, CA
95959-2250
530-265-4531
530-478-6118 TDD
530-478-6109 FAX

File Code: 1560
Date: March 21, 2008

Harold J. Singer
Executive Officer
CWQCB - Lahontan Region
2501 Lake Tahoe Blvd.
So. Lake Tahoe, CA 96150

Dear Mr. Singer:

We appreciate the opportunity to comment on the draft "Total Maximum Daily Load for Sediment" staff report for the Middle Truckee River. The Tahoe National Forest shares your interest in protecting and improving the water quality in the Truckee River and intends to work with the Lahontan Regional Water Quality Control Board to address water-quality issues on National Forest System lands. However, we believe that the data and analysis in the staff report are not technically adequate to support the TMDL load allocations and could lead to ineffective management decisions. Our concerns are expressed in the enclosed comments.

As an example, the report's determination of the required sediment load reduction is based on the percentage of years during which suspended-sediment concentrations were at or above a threshold concentration, rather than any measure of the load itself (see our comment 21).

My staff has alerted me that the paperwork required to get agreement between your office and mine is often very time consuming and costly. They feel it reduces our ability to do work on the ground and would like to see us find ways to streamline processes. I would like to suggest that we meet to see if there are ways that we can streamline, improving our ability to protect and restore the watersheds and water quality in the long term.

We remain committed to working with you to achieve our mutual water quality goals in the Truckee River. If you have any questions, please contact Carol Kennedy, 530-478-6239.

Sincerely,

/s/ Tom Quinn
TOM QUINN
Forest Supervisor

ENCLOSURES (2)

COMMENTS ON MIDDLE TRUCKEE SEDIMENT TMDL STAFF REPORT, PUBLIC REVIEW DRAFT

Barry Hill, Regional Hydrologist
February 22, 2008

1. General Comment--The TMDL report is based on data included in 3 reports prepared under contract to the Lahontan RWQCB (Board). The quality of these data is critical to their usefulness in determining impairment and quantifying sediment sources. The USEPA has established requirements for Quality Assurance Project Plans (QAPP) to document the quality of data needed for environmental decisions (EPA QA/R-5, USEPA, 2001). The documentation of the methods used for the Herbst and Kane 2006 report (provided by the Lahontan Board staff) lacks almost all of the elements of a QAPP. Most significantly, the Herbst and Kane 2006 study apparently did not include any protocols for sample handling and custody, quality control (including blind, duplicate, and spike samples), equipment testing, data management, and data review, verification, and validation. Given these shortcomings, it is difficult to evaluate the adequacy of the results of the Herbst and Kane 2006 study. Quality assurance and control documents for the DRI studies were requested from the Lahontan Board staff but have not been received and cannot be evaluated at this time.

2. p. 3-7—USGS turbidity samples collected at monthly intervals using standard, verified methods over a 33-year period showed that the Truckee River did not exceed the turbidity WQO. DWR in-situ turbidity measurements taken over a 16-month period at 15-minute intervals produced much higher results that exceeded the WQO. However, as noted on p. 3-7, the equipment used to collect these measurements is "affected by instrument malfunctions and requires data cleanup to account for instrument drift and fouling." The report goes on to state "Although these data indicate the turbidity standard is not met," Water Board staff recommends caution when drawing conclusions from the DWR dataset. Examination of the data show wide variability within short time frames under consistent flow conditions, which suggest the potential for instrument fouling and/or data cleanup issues. Additionally, the data are not normally distributed as indicated by the disparity in the average (44.5 NTU) and median (3.4 NTU) turbidity values. This suggests that data outliers skew the analysis of compliance for this dataset with the MOMM WQO, which is based on an arithmetic average. For non-normally distributed datasets, a median or geometric mean may be more appropriate to assess the central tendency (Helsel andGilroy, 2005)." Quality assurance information is needed to determine the adequacy of the DWR data for drawing any conclusions about impairment resulting from turbidity. Instrument fouling would tend to produce spurious high turbidity values, which might explain the disparities between the USGS and DWR data sets. As the USGS and DWR monitoring apparently overlapped in 2002, the report should include a comparison of USGS and DWR data for the dates and times of USGS sample collection in addition to DWR QA/QC results.

3. p. 3-9--The SSC benchmark of 25 mg/L as the 90th percentile, used in the TMDL report as an impairment threshold, is very conservative and was based on a very limited number of information sources. Much more information is available and should be considered in establishing an appropriate impairment benchmark. The internal EPA report titled "The Biological Effects of Suspended and Bedded Sediment (SABS) in Aquatic Systems: A Review, by Walter Berry, Norman Rubenstein, Brian Melzian, and Brian Hill, dated August 20, 2003, includes several hundred references relevant to effects of suspended sediment on aquatic organisms. This report is available online at: http://www.epa.gov/waterscience/criteria/sediment/appendix1.pdf.

4. p. 3-9, table 3-3—Suspended-sediment data show no impairment for sediment at Farad over a 28-year period, based on the 25 mg/L 90th percentile impairment threshold (benchmark). The report notes that the SSC data may be biased toward lower concentrations owing to sampling at lower than representative flows. This should be evaluated in the report by comparing the range of streamflow at SSC sampling times to streamflow throughout the monitoring period. Data presented in Figure 3-2 indicate that samples were collected throughout the range of flow, and if so, the SSC data are unlikely to be biased toward lower concentrations.

5. p. 3-11 to 12, figure 3-2—The assumed SSC benchmark is 25 mg/L as the 90th percentile. Therefore, 10% of observed SSC concentrations can exceed 25 mg/L without exceeding the benchmark. The statement that all samples that exceed the 25 mg/L threshold exceed the benchmark is incorrect because exceedance can only be determined by comparing the number of samples with concentrations above 25 mg/L with the total number of samples. As noted in comment 4, this comparison shows no evidence of impairment for the Truckee River at Farad. The association of higher sediment concentrations with higher flows is consistent with the general and well-known relations between SSC and streamflow. The comparison between SSCs at Tahoe City and Farad does not necessarily indicate excessive erosion in the intervening watershed; the river at Tahoe City is flowing directly out of Lake Tahoe, an extremely effective sediment trap. Even in the absence of anthropogenic erosion, SSCs would likely be higher at Farad than at Tahoe City as a result of natural erosion in the intervening watershed and channel.

6. p. 3-14—Results of the Herbst and Kane 2006 study of deposited sediment and macroinvertebrates do not clearly demonstrate sediment impairment of the Truckee River. The TMDL report itself states that "Because sedimentation measurements were not consistent with hypothesized up- and downstream relationships or loading estimates, indications of excessive deposited sediment were not conclusive…There was no clear relationship between channel margin sedimentation and IBI scores in the main channel of the river…In summary, channel margin BMI communities showed expected responses to increasing sedimentation, but there were no consistent patterns of sediment deposition to determine if measured sediment represented levels above the Truckee's carrying capacity (i.e., excessive sedimentation) (p. 3-14)."

7. p. 3-15, section 3.3.4, Conclusions, item 1.—The statement that SSC samples at Farad indicate exceedance of benchmarks for protection of aquatic life is incorrect. As noted

above, the SSC data indicate that the SSC threshold of 25 mg/L is exceeded less than 10% of the time, which means that the benchmark of 25 mg/L **as the 90th percentile** is achieved. The TMDL report suggests that ***any*** exceedance of the 25 mg/L threshold constitutes exceedance of the benchmark, which is incorrect. SSCs of 25 mg/L or greater do not constitute exceedance unless more than 10% of the samples are in this range.

8. p. 3-15, section 3.3.4, Conclusions, item 2.—Please see comment 2. above.

9. p. 3-15, section 3.3.4, Conclusions, item 3.—Please see comment 6. above.

10. p. 3-15, section 3.3.4, Conclusions, item 4.—This result shows that 62.5% of the sampling sites, well over half, show no impairment.

11. p. 3-15, section 3.3.4, Conclusions, item 6.—Future growth is inappropriate as a rationale for TMDL development. Effects of urban growth on sedimentation should be handled under local grading ordnances and BMPs. No net increase in sediment should be assumed for future growth.

12. p. 4-2—see comment 3. above re: available information related to sediment effects on aquatic organisms.

13. p. 4-6—see comment 7. above re: exceedance of benchmark. The statement that any sample falling on or above the curve on Fig. 4-2 exceeds the benchmark is incorrect. Exceedance of the benchmark of 25 mg/L as the 90th percentile can only be determined by comparing the number of samples exceeding 25/mg/L with the total number of samples.

14. p. 4-7—Exceedance of the 25 mg/L threshold for only 5% of total samples indicates that the benchmark of **25 mg/L as the 90th percentile** is not exceeded.

15. p. 5-4—The DRI (2001) study used a sediment transport curve ("rating curve") approach to estimate current-condition suspended-sediment loads in the Truckee River and its tributaries. The application of this approach involved several technical inadequacies that limit the usefulness of the results for determining existing sediment loads and "target" loads to be achieved through TMDL implementation, including:

a. Depth-width integrated isokinetic (EWI) sample concentrations were pooled with grab sample concentrations and TSS results were pooled with SSC results to develop transport curves despite a lack of verification of relations between EWI and grab sample concentrations or TSS and SSC concentrations at higher flows that are critical for sediment transport.

b. Equation 5, used to estimate sediment concentrations for times at which no samples were collected, is mathematically incorrect. The equation should be expressed in terms of Q rather than log Q.

c. Equation 6, used to estimate average daily sediment loads, is also incorrect for this reason. Furthermore, Equation 6 assumes that sediment load and sediment concentration are the same, where in fact sediment loads are determined by multiplying concentrations by streamflow and a units conversion factor.

d. Although instantaneous streamflow data were used as the independent variable to develop equations 5 and 6, daily mean streamflows were used with the equation to estimate loads. Although the authors argue that this is an acceptable practice, this approach is statistically invalid because it applies a regression to data that are not of the same type used to develop the equation.

e. The sediment transport curve method requires the assumption of a direct relationship between sediment concentration and streamflow, that is, as streamflow rises concentration rises. However, data presented in the DRI (2004) report show that concentration peaks and streamflow peaks may not coincide. The load estimates developed using the sediment transport curves will be higher than the actual loads for stations with non-synchronous concentration and streamflow peaks.

f. Accurate determinations of sediment loads require sediment samples over the range of flow experienced during the period of interest, which in this case is 1996-97. The highest flows for which sediment samples were collected for this study were much lower than the peak flows recorded at USGS gages for this 2-year period. Therefore, estimating sediment loads for the critical high-flow periods required extrapolation of the sediment transport curves well beyond the range of the data used to develop them. There is no way to determine the accuracy of these estimates.

g. Most of the tributaries for which sediment loads were determined lacked records of streamflow. Streamflow records were synthesized by comparing streamflow measurements at the tributaries with recorded streamflows at nearby gages. No information is provided on the number of streamflow measurements used for the comparison or the range of flows measured relative to the annual extremes. Prediction intervals for estimated sediment loads range over one to two orders of magnitude, indicating substantial uncertainty in the computed loads

16. p. 5-10-- Sediment samples collected for the DRI (2004) report did not include samples representative of high flows. For example, the maximum flow sampled at Farad was 1,308 cfs, while the peak flow during the 2002-03 study period was 1,770 cfs and the peak of record was 17,500 cfs. Therefore, concentrations and loads estimated for flows higher than the sampled range are highly uncertain. Several of the estimated monthly sediment loads reported in the DRI (2004) report are much too high to be credible, and cast doubt on the modeling approach used in this study. In particular, the estimated load

of 61 million tons for the Farad station in June 2002 (equivalent to land surface lowering of roughly one inch per month across the entire watershed) is not reasonable.

17. p. 5-13—The estimated loads from urban areas using the EMC approach are low because they only account for the increased sediment concentrations from urban areas. Loads are computed as products of flow, concentration, and a conversion factor. Runoff (flow) from urban areas has been demonstrated to be higher than forested watersheds owing to large areas of impervious surfaces. The estimated loads from urban areas should be based on increases in both sediment concentration and flow.

18. p. 5-20, table 5-6—"Intervening zone" sediment loads are estimated as the difference between the estimated load at Farad and the sum of the estimated tributary loads. This represents 32% of the total suspended sediment load at Farad, and is therefore an important number to determine accurately. As the estimated loads for Farad and the tributaries are subject to large uncertainty, an independent assessment of sediment loads from the intervening area should be undertaken.

19. p. 6-2, table 6-1—Although the data have been arbitrarily grouped to produce results that suggest exceedance of the benchmark at Farad, the complete long-term SSC data set does not indicate impairment, nor does the long-term USGS turbidity data. If the benchmark is meant to apply to time frames other than the entire period of record, then this should be stated earlier in the document and justified with results from scientific literature. The separation of SSC data into years was not previously discussed and is not consistent with the analysis of the entire data set (p. 3-7, table 3-3). This is important given the approach used to determine the required load reduction (see comment 20 below).

20. p. 6-2—The use of the estimated sediment loads for a unusually wet water years in determining load allocations is inappropriate given that the benchmark is the SSC 90th percentile for all years and not just the wet years.

21. p. 6-2--The method used to determine the required load reduction is mathematically incorrect. The load reduction of 20% was based on the percentage of ***years*** in which SSC 90th percentiles were at or above 25 mg/L and not any measure of the load itself. Even if we assume the separation of the SSC data into annual groups is warranted, this approach is flawed because it does not incorporate any measure of how much the actual sediment loads or concentrations would need to be reduced to meet the 25 mg/L benchmark. To compute the load reduction correctly, the 90th percentile for the entire data set for all years would need to be compared to the benchmark, but as noted above, this comparison would show that the benchmark is not being exceeded and therefore no load reduction is necessary.

22. p. 6-2, equation 6-2—As described in comment 20. above, the loading reduction computed this way is not correctly computed and all subsequent analyses using this computation are in error.

23. p. 7-2, table 7-1—USFS BMPs monitored under the BMPEP for the Tahoe National Forest have been shown to be effective in preventing any effects to water quality for more than 80% of all evaluations.

24. p. 7-2—no allocation should be made to future development. Not only is this highly speculative, but it puts the burden for reducing erosion from new development onto other parties that have no control over and derive no benefit from this development.

25. p. 10-10—A cooperative Lahontan Board-USFS approach to road erosion and legacy problems is within the scope of the revised workgroup strategy for recertification of the MAA.

26. p. 10-11—The Tahoe NF EIS for travel management will soon be publically available, and comments from the Lahontan Board will be welcome.

Comments and Critique of the Middle Truckee River Sediment TMDL - Bioassessment Report by Herbst and Kane (2006).

Joseph Furnish, Ph.D., Regional Aquatic Ecologist, US Forest Service, Vallejo, CA. March 21, 2008.

My comments are based on my review of the 2006 report by Herbst and Kane entitled *Fine Sediment Deposition and Invertebrate Communities in the middle Truckee River, California: Development of Criteria for Establishing TMDLs*, and critiques previously submitted by Barry Hill, Forest Service Regional Hydrologist, and Dr. LeRoy Poff of Colorado State University. I did not review other documents prepared for this TMDL development effort.

Basically, the report by Herbst and Kane (2006) adequately reviews the literature on sediment impacts to stream invertebrates. Although the experimental design made sense for providing the basis for establishing a biological TMDL, complications resulting from flaws in estimates of sediment yield and unexpectedly high within-site variability in concentrations of fine sediments confounded a clear interpretation of the data. The flaws in the sediment yield models are thoroughly detailed in the comments from Barry Hill, Regional Hydrologist. The study by Herbst and Kane did clearly verify that aquatic macroinvertebrates are sensitive to fine sediments and that the metrics chosen to evaluate potential impacts behaved in the expected fashion (e.g. richness indices generally declined as sedimentation increased) in 11 of 13 instances and none in a counter intuitive way (Table 3, page 21 and Table 4, page 23).

I believe that the lack of clear, consistent patterns of fine sediment deposition related to modeled sediment volumes from the tributaries sampled is more a reflection an inadequacy in the accuracy of the model in predicting inputs of fine sediment. Macroinvertebrate samples were collected at a micro-habitat scale along channel margins, which apparently did not accurately reflect sediment regimes above and below each site, which in turn did not allow elucidation of a dosage response by invertebrates to sedimentation. It would be appropriate and worthwhile to make an effort to improve the model to more accurately predict sediment yield from each tributary, partition sedimentation due to anthropogenic vs. natural causes, and establish the relationship between discharge and sediment dynamics. It would also be useful to attempt a back calculation of tributary sediment yield from the threshold of impairment at 3.4 kg m^{-2} dry fine sediment identified by Herbst and Kane. This may be intractable because there are so many important variables to account for in constructing a credible model and the more important question may be how sediments are distributed in the channel river, which in turn would help to predict where sediment impacts would be most apparent. In the case of fine sediments the most

important determinant of impacts may be channel geomorphology favoring deposition rather than proximity to a tributary.

In response to the high within-site variability observed additional replicate samples would be required to improve evaluation of site conditions and reduce variability to acceptable levels. As suggested by Herbst and Kane, pebble counts according to the Region's Stream Condition Inventory (SCI) Protocol, might more appropriately characterize sedimentation at the stream reach rather than micro-scale. I can say it no better than Herbst and Kane: "The challenge is to measure representative sediment deposition quantity and quality and associated benthic invertebrate communities at particular locations within zones of potential deposition, and to also characterize several representative reaches along the river that are exposed to variable sediment loads from particular tributary sources." Basically, I believe the authors are advocating a stratified sampling design based on channel geomorphology to predict and sample where sediment impacts are going to be most apparent. Given the high variability of river channel sediments, this may be a more useful approach than a strictly random location of samples.

One clarification to the comments from Barry Hill that were submitted a few weeks ago: Although a Quality Assurance Project Plan was not available to him, I have reviewed the QAPP prepared by Herbst (2001) and am convinced that it provides all of the requisite information to satisfy State standards.

The anomalous results of the Trout Creek samples are troubling because they are so inconsistent with results from other sites, as well as those from the on-site targeted-riffle sample. Since there was no clear way to interpret why the site was an outlier, it is problematic to exclude it from the analysis. If the reason was fluctuation in discharge exposing the community to periodic drying, it raises the possibility that this may be an important, but unaccountable factor at other sites.

The comments regarding the loss of mussel beds comprised of the western pearlshell *Margaritifera falcata* over the last half century are noteworthy. Freshwater mussels are among the most endangered species on our planet (Lydeard and others 2004) and the abundance and distribution of this species is a good indication of condition and trend. I believe that this mussel bed should be observed to track status and trend every few years. Individuals are filter feeders and may accumulate contaminants more than many other aquatic invertebrates. They may also live for over a century so major population declines like that seen in the Middle Truckee River (e.g. from @10,000 to 150 individuals from 1940's to present) are of significance and concern.

In summary, the study by Herbst and Kane clearly demonstrated that the invertebrate communities of the Middle Truckee River are impacted and that they serve as useful indicators to establish desirable sediment loadings to the system. Major improvements

could be made by adjusting the timing and placement of sample sites, and reconciling problems with erosion modeling that complicate data interpretation because the model is unreliable.

References Cited

Herbst, D.B. 2001. *Quality assurance project plan - Aquatic invertebrate Bioassessment monitoring in the Eastern Sierra Nevada* [California State Water Resources Control Board, Lahontan Region]. Available at: http://www.swrcb.ca.gov/rwqcb6/files.htm.

Lydeard, C., R.H. Cowie, W. F. Ponder, A. E. Bogan, P. Bouchet, S.A. Clark, K.S. Cummings, T.J. Frest, O. Gargominy, D.G. Herbert, R.Hershler, K.E. Perez, B. Roth, M. Seddon, E.E. Strong, and F.G. Thompson. 2004. The global decline of nonmarine mollusks. Bioscience 54(4):321-330. This article is available at http://taddeo.ingentaselect.com/vl=4683764/cl=29/fm=docpdf/nw=1/rpsv/cw/aibs/00063568/v54n4/s9/p321.

From: "Doug Praetzel" <DPraetzel@spi-ind.com>
To: <aholden@waterboards.ca.gov>
Date: 3/21/2008 7:39:27 AM
Subject: draft TMDL comments

Sierra Pacific Industries
Tahoe District
PO 1450
Cedar Ridge, CA 95924

Anne Holden
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
Email: aholden@waterboards.ca.gov <mailto:aholden@waterboards.ca.gov>
Phone: (530) 542-5450
Fax: (530) 544-2271

Dear Ms. Holden,

Thank you for allowing us to comment on the Draft TMDL for Middle Truckee River Watershed. Your efforts in preparing this document are commendable as gathering data sources from numerous agencies, preparing studies to obtain data gaps, and compiling all this into a document for the general public to decipher is no small feat. My comments and questions follow. Comments are bullet pointed and followed or preceded by context taken from the TMDL document.

* YOUR OWN SCIENCE DOESN'T INDICATE THERE IS A SEDIMENT PROBLEM

(QUOTES FROM TMDL DOCUMENT ARE IN ITALICS. UNDERLINED QUOTES ARE FOR EMPHASIS)

3.3.3 Data to Assess Current Conditions
Pages 3-6 thru 3-8

Turbidity grab sampling:
The WQO is 3 nephelometric turbidity units (NTUs), expressed as a mean of monthly means2 (MOMM) for the period of record. These data indicate that the WQO for turbidity is met at the Farad sampling station.

* LONGEST DATA COLLECTION TO DATE. RESULTS ARE WITHIN YOUR PERMISSIBLE PARAMETERS.

Continuous turbidity monitoring:
The system provides the frequency of measurement to allow detailed analysis, but is also affected by instrument malfunctions and requires data cleanup to account for instrument drift and fouling (Lewis, 2002).
Turbidity measurements collected from May 2002 through August 2003 (DWR, 2007) at the Farad monitoring station were analyzed and compared to the numeric turbidity WQO.....

Although these data indicate the turbidity standard is not met, Water Board staff recommends caution when drawing conclusions from the DWR dataset. Examination of the data show wide variability within short time frames under consistent flow conditions, which suggest the potential for instrument fouling and/or data cleanup issues. Additionally, the data are not normally distributed as indicated by the disparity in the average (44.5 NTU) and median (3.4 NTU) turbidity values.

* THIS ONE YEARS' WORTH OF "QUESTIONABLE" DATA COLLECTION, WHEN

COMBINED WITH THE 30-YEAR GRAB SAMPLES, INCREASES THE RESULTS TO PUT IT OVER YOUR MINIMUM SPECS. HOWEVER, THIS TYPE OF DATA COLLECTION DOES NOT APPEAR TO BE AS TRUSTWORTHY AS THE GRAB SAMPLES. IN YOUR OWN WORDS YOU STATE THIS. WHY DO YOU CONTINUE TO USE IT IN FURTHER ANALYSIS OF THE TMDL?

Suspended Sediment Grab Samples
Pages 3-9 thru 3-10

Comparison of the SSC data to the benchmarks is useful for discussion purposes; however, the data are highly influenced by the timing and frequency of sampling. For example, some locations have been sampled frequently during peak flow events to assess loading under these conditions. Results from such studies skew the overall SSC record toward the high end and are not representative of the full range of flow and SSC conditions associated with individual water bodies. Conversely, some waters were sampled relatively infrequently and may have been sampled predominantly during lower
base flow conditions. These results will skew the SSC record toward the lower end and do not represent conditions when significant loading occurs. Therefore, the data should be interpreted with caution because sampling events were not necessarily consistent between surface waters.

* UNSURE OF DATA. FOR DISCUSSION PURPOSES ONLY. THESE RESULTS ARE USED THROUGHOUT THE DOCUMENT ALSO. WHY ARE YOU USING INCONCLUSIVE DATA TO FORMULATE YOUR TMDL?

Flow and Load Duration Curves
Pages 3-10 thru 3-12

Although there are less SSC data available for upstream sampling points on the
Truckee River (Near Truckee and Tahoe City), the data show that benchmarks are exceeded at higher flows much more frequently at Farad than at the upstream locations. This indicates a cumulative and significant increase in sediment loading at this most downstream sampling point, and suggests that the range of flows in which benchmarks are exceeded at Farad should be reduced.

* WHAT INFLUENCE DO BRONCO AND GRAY CREEKS HAVE ON THE FARAD SAMPLING POINT COMPARED TO TRIBUTARIES FURTHER UPSTREAM? THESE ARE THE NEAREST TRIBUTARIES TO FARAD.
* ARE THE ALLOWABLE LOAD EXCESSES AT THE HIGHER FLOWS MOSTLY ATTRIBUTED TO GRAY AND BRONCO CREEKS? :

3.2.2 Gray and Bronco Creeks (page 3-2)
An article in the Reno-Gazette Journal (Timko, S., in LRWQCB, 1991) noted that Sierra Pacific Power's Reno-Sparks water treatment plant was shut down due to sediment laden water discharged into the Truckee River from Gray and Bronco creeks. This led to both creeks being reclassified from "unknown" to "impaired" during the 1992 Water Quality Assessment process. The Reno-Sparks treatment plant was shut down again on July 14, 1992 and July 18, 1995 due to thunderstorm runoff of "extensive quantities of mud" from the Gray Creek watershed (NDWP, 1997). Water Board staff does not have data that indicate the listings were based on beneficial use impairment in Gray or Bronco creeks; rather, the listings were based on the creeks' sediment discharges that affected water quality in the Truckee River.

Deposited Sediment and Bioassessment:
Page 3-12 thru 3/14

The researchers determined that standard bioassessment techniques, which were developed for smaller, wadeable streams (e.g., the targeted riffle method), are not ideal for assessing the Truckee River....

Although researchers did not consider standard bioassessment sampling as the best evaluation method for the Truckee River, these types of samples were also collected to add information on aquatic life conditions. Targeted riffle sampling consisted of collecting BMI samples from riffle habitat in the main channel of the Truckee River, downstream of tributary confluence locations.....

Discussion
In general, study results were mixed. BMI communities showed expected responses to increasing levels of sediment. That is, where more deposited sediment was measured in channel margins, biologic metrics indicated less integrity of biologic health. To illustrate this, researchers selected a sediment volume limit of 100 milliliters (ml) from channel margins to examine differences in BMI metrics above and below that level.
Approximately half of the BMI samples showed loss of integrity corresponding to sediment volumes of 100 ml or greater. Overall, this relationship demonstrates that sedimentation adversely affects invertebrate communities, but due to the lack of conformity to anticipated sediment loading patterns, it is unclear whether the measured sediment volumes can be termed excessive.

For example, half of the downstream sample sites showed greater volumes of sediment compared with upstream sample sites; however, statistically significant inferences regarding these differences were not possible. Differences in mean volumes between sites were not statistically significant. No relationship was found between estimated tributary loading and channel margin sediment volumes. Because sedimentation measurements were not consistent with hypothesized up- and downstream relationships or loading estimates, indications of excessive deposited sediment were not conclusive.

* TARGETED RIFFLE SAMPLES OCCURRED ON THE TRUCKEE RIVER, WHICH, ACCORDING TO THE RESEARCHERS, IS NOT IDEAL FOR ASSESSMENT USING THIS TECHNIQUE. HOWEVER, THIS DATA IS USED IN YOUR CONCLUSIONS AND THROUGHOUT DOCUMENT. WHY IS DATA NOT SUITED FOR COLLECTION USED?

* THE INSTREAM TARGETED RIFFLE SAMPLES DID NOT OCCUR WITHIN TRIBUTARIES SHOWN ON TABLE 3-4:
Targeted riffle sampling consisted of collecting BMI samples from riffle habitat in the main channel of the Truckee River, downstream of tributary confluence locations.
* HOW CAN YOU CONCLUDE THAT THE TRIBUTARIES SHOW THESE RESULTS (IBI SCORES) WHEN THEY WERE NEVER SAMPLED? WHY WEREN'T OTHER AREAS ALONG THE TRUCKEE RIVER SAMPLED AS WELL? YOUR HYPOTHESIS WAS NEVER REALLY PROVEN BECAUSE NO OTHER SAMPLES WERE TAKEN WHERE NO TRIBUTARIES WERE SUPPOSEDLY AFFECTING THE MAIN CHANNEL: (In summary, channel margin BMI communities showed expected responses to increasing sedimentation)

* TURBIDITY IS A NATURAL OCCURRENCE, NOT NECESSARILY BAD.
* WHY WEREN'T POLE AND DEEP CREEKS INCLUDED AS TRIBUTARIES INSTEAD OF BEING LUMPED INTO INTERVENING ZONES? IT WOULD HAVE BEEN INTERESTING TO COMPARE DATA FROM THESE RELATIVELY UNMANAGED WATERSHEDS WITHOUT RAILROAD OR HIGHWAY RUNOFF INFLUENCES TO OTHER WATERSHEDS.
* UNABLE TO FIND IN DOCUMENT WHERE NATURAL VS. MAN-MADE TURBIDITY IS DISSECTED.

TMDL and Allocations:
Page ii
TMDL attainment through targets that express "desired conditions" vs. actual sediment reductions.

* WHO DETERMINES WHAT DESIRED CONDITIONS ARE? IF YOU ARE NOT CONCERNED WITH NUMERIC TARGETS, HOW CAN YOU SAY THERE IS A PROBLEM WITH SEDIMENT (YOUR DATA PROVES THERE IS NO PROBLEM)? WHY GO TO ALL THE TROUBLE AND COST TO STUDY SEDIMENT LOADING WHEN YOUR RESULTS DISPROVE IT AND YOU WILL NOT USE THIS DATA TO MEASURE THE "SUCCESS" OF YOUR FUTURE EFFORTS TO REDUCE TMDL?

Problem Statement:
Page 3-1

* THE TIME PERIODS DURING WHICH EXCESSIVE SEDIMENTATION OCCURS ARE DURING HIGH FLOWS. HAVE YOU COMPARED THIS DATA TO OTHER (NON-TMDL) WATERSHEDS? ONE WOULD SURMISE THAT A WATERSHED AT HIGH FLOWS HAS GREATER SEDIMENTATION LEVELS WHEN COMPARED TO LOW FLOWS.
* WHAT PERCENTAGE OF TIME IS THE LOWER TRUCKEE WITHIN ITS "LIMITS" USING THE ORIGINAL FARAD DATA? THIS SEEMS TO BE A GOAL THAT IS IMPOSSIBLE TO OBTAIN. HIGH FLOWS (RAIN ON SNOW EVENTS, SEVERE SUMMER THUNDERSTORMS) RESULT IN MUCH MORE "NATURAL" SEDIMENT RUNOFF THAN WOULD SPRING THAWS AND NORMAL RAIN EVENTS IN THE FALL. WAS THIS A CONSIDERATION IN YOUR DATA COLLECTION?

Listing Basis For Truckee River, Gray and Bronco Creeks
Page 3-2

* YOUR HISTORICAL "DATA" FOR LISTING INCLUDES:
  - 1990 F&G MEMO
  - COMPLAINTS RELATED TO SEDIMENT DISCHARGE
  - SEDIMENT RELATED VIOLATIONS
  - SEDIMENTS FROM GRAY AND BRONCO CREEKS DURING SUMMER THUNDERSTORM EVENTS (THESE ARE BOTH UNDEVELOPED WATERSHEDS-ROAD LEGACY ISSUES ONLY.)
* NONE OF THESE REASONS ARE COMPELLING TO LIST. IT WOULD SEEM WISER TO DE-LIST AND PUT EFFORTS INTO CLEANUP USING THE REGULATIONS YOU HAVE IN PLACE NOW WHILE CONTINUING TO MONITOR (OUTSIDE AGENCIES CURRENTLY ALREADY MONITORING).
* WHAT CHANGES IN REGULATIONS/MITIGATIONS CAN THE "DISCHARGERS" EXPECT FROM IMPLEMENTATION OF THE TMDL VS. WHAT IS CURRENTLY IN PLACE?

Historical Conditions 3.3.1
Page 3-5 thru 3-6

3.3.2 Current Conditions, page 3-5 para. 3
* COMPARING SKI AREA TRAFFIC (1.6 MILLION VISITORS) TO ARIZONA PARK VISITORS IS A POOR ANALOGY. DIFFERENT CLIMATES, SOILS, TIME OF YEAR, ETC. IT MAKES IT LOOK PRETTY BAD ON OUR END WHEN ONLY 50,000 VISITORS CAN CAUSE "POLLUTED RUNOFF".

Page 3-6 #3 Disturbance of erosion sensitive lands:
According to the California Watershed Assessment (www.ice.ucdavis.edu/newcara), 54 percent of the Truckee River watershed has
"moderate" to "very high" erosion potential based on slope. More than 23 percent of the watershed is in the "high to very high" category, which is defined as slopes
greater than 15 percent.

* SLOPES GREATER THAN 15% ARE RANKED IN THE HIGH TO VERY HIGH

EROSION CATEGORY. HOW WAS THIS CALCULATED? 15% IS NOT VERY STEEP.

Conclusions 3.3.4
Page 3-15

1. HOW CAN SSC BE MORE AT DOWNSTREAM LOCATIONS? WOULDN'T SOME SETTLING OCCUR? DO GRAY AND BRONCO CREEKS HAVE A GREATER INFLUENCE ON SEDIMENT PRODUCTION THAN UPSTREAM LOCATIONS? BOTH OF THESE WATERSHEDS HAVE LEGACY ROAD ISSUES AND MOST RECENTLY, THE MARTIS FIRE.

2. THUNDERSTORMS, SNOWMELT AND DAM RELEASES. HOW MUCH "NATURAL" SEDIMENT OCCURS DURING THESE EVENTS?

3. YOUR CONCLUSION IS BASED ON DATA YOU DID NOT FIND CONCLUSIVE:
Approximately half of the BMI samples showed loss of integrity corresponding to sediment volumes of 100 ml or greater. Overall, this relationship demonstrates that sedimentation adversely affects invertebrate communities, but due to the lack of conformity to anticipated sediment loading patterns, it is unclear whether the measured sediment volumes can be termed excessive.

4. YOUR METHOD OF STUDY WAS NOT THE PREFERRED SO THE RESULTS AND YOUR CONCLUSIONS WILL BE DIFFICULT TO REGARD AS CONCLUSIVE:
The researchers determined that standard bioassessment techniques, which were developed for smaller, wadeable streams (e.g., the targeted riffle method), are not ideal for assessing the Truckee River.

Draft Responses to California Environmental Quality Act
Scoping Comments (response to USFS letter):
(USFS)Comment 2.4: We believe 1) the evidence does not support the listing; 2) most of the existing sediment problems can be effectively dealt with through programs already in place on the National Forests with the needless cost and delay associated with a TMDL
(LRWQCB) Response 2.4: 1) See response to comment 2.2.
2) We agree that sedimentation problems can, and are, being dealt with through programs already in place. State Board Policy (Resolution 2005-0050) recognizes that TMDLs can be implemented using existing regulatory tools. The TMDL simply provides a framework to take more effective actions to control sediment and to track the success of those actions.

* "MORE EFFECTIVE ACTIONS" APPEAR TO BE MORE REGULATIONS AND ADDITIONAL MITIGATION FOR FUTURE PROJECTS. SINCE YOU HAVE NOT BEEN SPECIFIC ON EITHER, IT LEAVES THE PRIVATE (AND PUBLIC) LAND MANAGER, DEVELOPERS, ETC. WITH NO WAY OF KNOWING COSTS OF FUTURE PROJECTS FROM ADDITIONAL MITIGATION AND/OR REGULATION PUT INTO PLACE BY YOUR AGENCY.

General Questions:
Problem statement (page i)
* YOU SEEM FOCUSED ON THE DEVELOPMENT ACTIVITIES WITHIN THE WATERSHED BEING MAIN CONTRIBUTORS TO THE SEDIMENT OR POTENTIAL SEDIMENT PROBLEM. ANY CURRENT DEVELOPMENT MUST ABIDE BY PERMITS OBTAINED BY YOUR AGENCY. HOW WILL THIS TMDL AFFECT FUTURE DEVELOPMENT? WILL THIS CREATE MORE REGULATION? IF NOT, WHY IS THIS TMDL NECESSARY IF NOTHING WILL CHANGE?

* LEGACY LAND USE IMPACTS CAN BE CORRECTED AS WELL AS ROAD DRAINAGE PROBLEMS. YOU LIST NO SPECIFIC SITES THAT ARE CONTRIBUTORS.

* IN THESE UNCERTAIN ECONOMIC TIMES, DO NOT ENFORCE UNNECESSARY AND

COSTLY REGULATION/MITIGATION WHERE LESS EXPENSIVE METHODS CAN BE USED. IF THE TMDL IS MADE EFFECTIVE, THIS DOCUMENT APPEARS TO GIVE A BROADER RANGE OF POWERS TO YOUR AGENCY. THINK OF YOUR ACTIONS TO PROTECT A RIVER SYSTEM IN ECONOMIC TERMS, NOT JUST ENVIRONMENTAL. THE TMDL HAS NO ECONOMIC IMPACT SECTION. WHILE IT IS YOUR DUTY TO ENFORCE THE LAWS OF CALIFORNIA, IT IS ALSO IMPERATIVE THAT THESE EFFORTS BE CARRIED OUT IN A MANNER THAT BOTH PROTECTS THE WATERS OF THE STATE AND PROTECTS THE POCKETBOOKS OF COMPANIES AND INDIVIDUALS FROM UNNECESSARY MITIGATION.

Thankyou for your time in answering my questions and concerns.

Doug Praetzel
Forester
Sierra Pacific Industries

TRUCKEE RIVER WATERSHED COUNCIL

PO Box 8568
Truckee, CA 96162
Ph: 530-550-8760
Fax: 530-550-8761
www.truckeeriverwc.org

[via email] March 21, 2008

Anne Holden
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd
South Lake Tahoe, CA ZIP

RE: Draft Middle Truckee River TMDL

Dear Ms. Holden,

On behalf of the Coordinating Committee (representing our stakeholder committees), the Truckee River Watershed Council (TRWC) supports the decision of the Lahontan Regional Water Quality Control Board (LRWQCB) to develop the Middle Truckee River TMDL.

Implementation and Monitoring Plan

In the DRAFT TMDL, a significant portion of the implementation and monitoring measures focus on issuance and compliance of permits, with limited focus on effectiveness or impact to impairment. In other words, the focus is on *compliance* with existing programs and permits, not on the *effectiveness* of the programs or permits in reducing impairment (or improving watershed conditions or beneficial uses).

What is proposed is not likely to generate sufficient data to substantiate results or trends toward or away from the TMDL objectives and targets. Insufficient data will create ambiguity about the effectiveness of the implementation activities. We request a monitoring plan to address effectiveness of activities and impact on impairment, watershed conditions and beneficial uses.

Statewide General NPDES Permit for Industrial Storm Water Discharges

This section lists several entities under permit (Tahoe Donner Maintenance Facility, Truckee Tahoe Airport District, Tahoe Truckee Sanitation District, Teichert Aggregates and Hobart Mills Material Processing Facility). We are not sure if this list is meant to be comprehensive. If so, there are several entities to be considered to be brought under this permit including but not limited to Union Pacific Railroad (transportation), Tahoe Truckee Unified School District (transportation and significant area of impervious surface), Eastern Regional Materials Recovery Facility (disposal site), the Truckee Fire Protection District (transportation), and Truckee Donner Recreation and Parks District (transportation). This should be addressed in a "recommended focus area" for Statewide General NPDES Permit for Industrial Storm Water Discharges

Sincerely,

Lisa Wallace

Lisa Wallace
Executive Director

Contractors Association of Truckee Tahoe
1998 - 2008
10 Years Building Our Community

RECEIVED
MAR 26 2008
By AH

March 21, 2008

Anne Holden
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

RE: Comments on Draft Truckee River TMDL

Dear Ms. Holden:

The Contractors Association of Truckee Tahoe (CATT) is a regional, non-profit trade association composed of 232 member companies covering the broad cross section of the building community. Thank you for this opportunity to provide comments on the draft TMDL plan. We do not offer an opinion here on the merits of the Preferred Alternative (20% load reduction) vs. the merits of the Less Stringent Numeric Target Alternative (Load Reduction less than 20%). We will continue to evaluate the draft SED and TMDL plan and may be submitting additional comment or question in anticipation of the formal hearing in May.

Comments below are referenced by page number in the draft TMDL:

2-4 Current Development – "High" as a description of growth is not defined; when contrasted with growth rates from the 1970's and 1980's, current figures show a dramatic decrease; second home residency means that impacts are less than what would be expected; development that occurred in the 1960's to the 1990's did not have, for the most part, sophisticated water quality measures incorporated into plans. The point is that today's growth activity is different from previous years and some qualifying statement could be added to make this description and subsequent descriptions more accurate for the reader.

2-5 Map doesn't show all Donner State Park holdings? Is Martis Creek Lake federally owned? Land owned by Special Districts (Recreation & Park District, Airport District, TTSA, etc.) is shown as private but could be shown in a separate category for better understanding. Truckee Donner Land Trust has significant holdings and there may be value in showing their owned or controlled lands for purposes of this map.

2-11 Please state who owns Martis Creek Reservoir for consistency with the other paragraphs.

P.O. Box 10570 • Truckee CA 96162 • 530-550-9999 • fax 530-550-9998 • info@ca-tt.com

JIM GIBBONS
Governor

STATE OF NEVADA

ANDREW K. CLINGER
Director

DEPARTMENT OF ADMINISTRATION
209 E. Musser Street, Room 200
Carson City, Nevada 89701-4298
(775) 684-0222
Fax (775) 684-0260
http://www.budget.state.nv.us/

March 18, 2008

Robert Dodds
California Regional Water Quality Control Board,
Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Re: SAI NV # **E2008-344** Reference:

Project: **Draft Basin Plan Amedment to Truckee Total Max Daily Load for Sediment**

Dear Robert Dodds:

The State Clearinghouse has processed the proposal and has no comment.

This constitutes the State Clearinghouse review of this proposal as per Executive Order 12372. If you have questions, please contact me at (775) 684-0209.

Sincerely,

for Krista Coulter
Nevada State Clearinghouse

DEPARTMENT OF TRANSPORTATION
DIVISION OF ENVIRONMENTAL ANALYSIS, MS 27
1120 N STREET
P. O. BOX 942874
SACRAMENTO, CA 94274-0001
PHONE (916) 653-7507
FAX (916) 653-7757
TTY (916) 653-4086

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March 21, 2008

RECEIVED
MAR 26 2008
By AH

Anne Holden
California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

Re: Comments on a Proposed Amendment to the Water Quality Control Plan for the Lahontan Region to Incorporate a Total Maximum Daily Load for the Control of Sediment Discharges in the Middle Truckee River Watershed, Placer, Nevada, and Sierra Counties

Dear Ms. Holden:

The California Department of Transportation (Department) appreciates the opportunity to comment on the Public Review Draft of the Total Maximum Daily Load (TMDL) for control of sediment discharges in the Middle Truckee River Watershed. The Department strongly supports efforts to protect the environment and achieve the best possible water quality and offers the following comments:

General Comments:

1. **The iterative framework described in the TMDL needs specific, more frequent checkpoints to assess the impairment of the Middle Truckee River.** Based on a limited review of available documents, we are concerned about the basis for the 303(d) listing of the Middle Truckee River as impaired for sedimentation. Specifically:

   - The California Department of Fish and Game (DFG) memorandum[i] provides no documentation or data to support its description of the Truckee River as having the problems of "substrate loss to siltation" (SS), "substrate loss to removal or lack of recruitment" (SR), and "loss of (adult) holding areas" (HA).

   - The 2006 Herbst and Kane bioassessment study[ii] was inconclusive with regard to whether "the measured sediment volumes can be termed excessive" (p. 3-14). In addition, one of the bases for the TMDL development (p. 3-15, item 3) refers to the

[i] Messersmith, 1990. *List of Impaired Water Bodies for the Updated Water Quality Assessment.* Memorandum to Dr. Robin Pinion, State Water Resources Control Board—Division of Water Quality from The Resources Agency—Department of Fish and Game, Region 2. February 26, 1990.
[ii] Herbst and Kane, 2006. *Fine Sediment Deposition and Invertebrate Communities in the middle Truckee River, California: Development of Criteria for Establishing TMDLs.* Sierra Nevada Aquatic Research Laboratory.

bioassessment techniques, which "are not ideal for assessing the Truckee River" (p. 3-13). Thus, given that this assessment method was not optimal and that the findings regarding excessive deposited sediment were inconclusive, we suggest that the bioassessment results be interpreted more carefully prior to being used as a basis for TMDL development.

- The SSC data (Truckee River at Farad) have been interpreted in several different ways with respect to the TMDL compliance targets:
  - In Table 3-3, it is reported that of the 434 samples collected between 1/1/1975 and 8/14/03, 8% (approximately 35 samples) were greater than 25 mg/L (p. 3-9).
  - In Table 6-1, it is reported that of 200 samples collected during "high flow" periods (above 556 cfs), 15% (30 samples) exceeded 25 mg/L, which is 5% above the 10% compliance target (p. 6-2). This analysis suggests that the Truckee River is close to compliance with the target, so obvious problems (e.g., legacy sites) should be prioritized for resolution during the first five to ten years of TMDL implementation, rather than burdening stakeholders with large and expensive projects.
  - In Table 6-1, it is reported that of the 90th percentile values for annual data (all years), 6 out of 27 years (22%) were not in compliance (p. 6-2). It is unclear when these annual exceedances occurred. In addition, the title of Table 6-1 describes the data as ranging from 1975 to 2006, which would be equivalent to 31 years of data. If the 1975 to 2003 data were used (as listed in Table 3-3), this would be equivalent to almost 28 years of data. A clarification of the calendar years for which data were analyzed is requested. In addition, time-series plots of the Truckee River flow and SSC data that are summarized in Table 3-3 and used for Figure 3-2 is requested.

We suggest that the Regional Board use a stronger, iterative framework given the questions regarding the classification of the Middle Truckee River as impaired. This is not to say that the Department will not work with the Regional Board to address sediment; on the contrary, the Department takes numerous measures to control sediment from roadways and fully intends to work with the Regional Board to attain the best water quality in the watershed. However, we wish to ensure that there is adequate opportunity to verify the proper course of action and BMP implementation. In particular, we wish to see a more detailed timeline for evaluation incorporated into the TMDL, along with a detailed strategy for implementing alternative control measures should the efforts under the TMDL not resolve the water quality impairment. The following issues should be addressed:

- Evaluate the TMDL every 5 years, rather than after 10 years (the halfway point estimated for TMDL attainment).
- Clearly specify what data (i.e., data collected beginning after TMDL adoption) will be evaluated for compliance with the TMDL.
- Provide specific questions that will be asked and addressed during evaluation of the TMDL in the event that the Middle Truckee River fails to meet the Water Column Target after five-, ten-, 15-, and 20-year increments. For example, on p. 5-1, it is stated that "unmeasured inputs

include . . . in-stream erosion in the Truckee River." If, after five years, the Truckee River fails to meet the Water Column Target, in-stream erosion (or stream bed/channel erosion) is something that could potentially be considered as a source of suspended sediment concentration (SSC).

- Provide a framework for reevaluating and adapting the TMDL based on findings from periodic review. For instance, it is envisioned that the implementation actions of addressing legacy sites will bring the river into compliance with the target. If the river attains the target, then no further activities would be required.

2. **It is suggested that the TMDL Target Monitoring Plan include more frequent sampling for the suspended sediment concentration (SSC) at Farad.** Within the TMDL, it is stated that SSC data "are highly influenced by the timing and frequency of sampling" (p. 3-10). According to the TMDL Target Monitoring Plan (Table 10-2, p. 10-15), SSC monitoring at Farad takes place "generally monthly". Both the representativeness of the samples (timing) and the total number of samples required to be collected annually (frequency) are of concern.

   - Timing: In reviewing Figure 3-2, it appears that more samples were collected at higher flows, which could result in more observed exceedances at higher flows. This supports the idea that more data points should be collected to represent a variety of conditions and more accurately assess whether or not exceedances correlate with greater precipitation and/or higher flows.

   - Frequency: Monthly sampling to assess annual compliance with the Water Column Target may lead to biased data, as only 12 data points will be collected annually. We understand that the 12 data points will be evaluated based on the 90th percentile SSC value for that year; however, if just one sample is greater than or equal to 25 mg/L, 8.3% of the data will be out of compliance; if two samples are greater than or equal to 25 mg/L, 17% of the data will be out of compliance.

   Thus, in order to obtain an appropriate number of data points collected during representative conditions, it is suggested that more frequent, regular (i.e., weekly) sampling be conducted in the Truckee River at Farad by the Desert Research Institute.

3. **Has consideration been given to any natural background loading? Has a distinction been made between legacy site loading and natural background loading?**

4. **How will legacy site restoration, including site identification and prioritization, be implemented?**

Specific Comments:

1. **The numeric Water Column Target should be an approved Lahontan Basin Plan objective.** Within Section 2.3, "Applicable Water Quality Objectives" (p. 2-12), it is stated that "the majority of sediment-related water quality objectives are expressed in *narrative* form, based on the protection of beneficial uses" (emphasis added). For the purpose of this TMDL, the desired conditions for the protection of aquatic life are represented by a *numeric* target. For determining the TMDL, the Water Column Target for the suspended sediment concentration in the Truckee River at Farad is a numeric

objective that will be evaluated in two ways: (a) the annual water year 90th percentile SSC value should be less than or equal to 25 mg/L, and (b) fewer than 10% of SSC values during high flow periods (above 556 cfs) should be greater than 25 mg/L (Table 6-1, p. 6-2). This numeric target should be subject to Porter-Cologne considerations and be incorporated into the *Water Quality Control Plan for the Lahontan Region: North and South Basins* as an approved objective for the Middle Truckee River at Farad.

2. **The "Current Conditions" for major highways should be updated**. The estimated annual average daily traffic for Interstate 80 through the Truckee Corridor is based on the *2005 Traffic Volumes on the California State Highway System* report (p. 3-5). The *2006 Traffic Volumes on the California State Highway System* report has been published, and these updated values should be included within the TMDL.[iii]

3. **The sediment loading values in Tables 5-3 and 5-6 should be reviewed for calculation errors.** As an example, in Table 5-3 (p. 5-14), the sediment loading for urban areas in the Little Truckee subwatershed is incorrectly listed as 2 tons. This value should be 0, since the urbanized area in this subwatershed is 0%. In Table 5-6, the loading for urban areas in the Little Truckee subwatershed is listed correctly as 0 tons.

4. **The language describing the Department's permit (p. 10-6) should be modified.** Under Section 10.3, "Sediment Control Programs" (p. 10-6), the language for "Snow and Ice Control" references the Department's permit as follows:

   "During the 2007 update of the Caltrans permit, Water Board staff submitted comments to the State Water Board to revise the permit to including reporting requirements for this information."

   The above language should be modified to reflect the fact that the Department's permit is currently under negotiation, and the permit update did not occur in 2007.

Thank you for the opportunity to comment. The Department strongly supports the goals of the TMDL for the control of sediment discharges in the Middle Truckee River Watershed, and we hope that these comments are helpful. If you have any questions, please contact Joyce Brenner, Acting Office Chief, Stormwater Program Implementation, at (916) 653-2512.

Sincerely,

G. SCOTT McGOWEN
Chief Environmental Engineer

[iii] http://traffic-counts.dot.ca.gov/2006all.htm

STATE OF CALIFORNIA

GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

STATE CLEARINGHOUSE AND PLANNING UNIT

ARNOLD SCHWARZENEGGER
GOVERNOR

CYNTHIA BRYANT
DIRECTOR

RECEIVED
MAR 26 2008
By AH

March 24, 2008

Anne Holden
Regional Water Quality Control Board, Region 6 (Lahontan)
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Subject: Middle Truckee River Watershed Total Maximum Daily Load (TMDL) for Sediment, Basin Plan Amendment
SCH#: 2008022021

Dear Anne Holden:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. On the enclosed Document Details Report please note that the Clearinghouse has listed the state agencies that reviewed your document. The review period closed on March 21, 2008, and the comments from the responding agency (ies) is (are) enclosed. If this comment package is not in order, please notify the State Clearinghouse immediately. Please refer to the project's ten-digit State Clearinghouse number in future correspondence so that we may respond promptly.

Please note that Section 21104(c) of the California Public Resources Code states that:

> "A responsible or other public agency shall only make substantive comments regarding those activities involved in a project which are within an area of expertise of the agency or which are required to be carried out or approved by the agency. Those comments shall be supported by specific documentation."

These comments are forwarded for use in preparing your final environmental document. Should you need more information or clarification of the enclosed comments, we recommend that you contact the commenting agency directly.

This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act. Please contact the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process.

Sincerely,

Terry Roberts

Terry Roberts
Director, State Clearinghouse

Enclosures
cc: Resources Agency

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
(916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

State Clearinghouse Data Base

SCH# 2008022021
Project Title Middle Truckee River Watershed Total Maximum Daily Load (TMDL) for Sediment, Basin Plan Amendment
Lead Agency Regional Water Quality Control Board, Region 6 (Lahontan), South Lake Tahoe

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Type MND Mitigated Negative Declaration
Description

The Lahontan Regional Board intends to adopt a Basin Plan amendment incorporating the Total Maximum Daily Load for Sediment in the Truckee River Watershed, Placer, Nevada and Sierra Counties into the Water Quality Control Plan for the Lahontan Region (Basin Plan). The project would involve actions to reduce sediment loads in the watershed and protect beneficial uses.

Lead Agency Contact

Name Anne Holden
Agency Regional Water Quality Control Board, Region 6 (Lahontan)
Phone (530) 542-5450 **Fax**
email
Address 2501 Lake Tahoe Boulevard
City South Lake Tahoe **State** CA **Zip** 96150

Project Location

County Placer, Nevada, Sierra
City Truckee
Region
Cross Streets
Parcel No.
Township **Range** **Section** **Base**

Proximity to:

Highways 80, 89, 267
Airports Tahoe-Truckee
Railways
Waterways Middle Truckee River and tributaries
Schools
Land Use High elevation mountainous environment within the Truckee River watershed. Land use is generally for commercial, residential, and recreational purposes.

Project Issues Air Quality; Archaeologic-Historic; Biological Resources; Cumulative Effects; Noise; Public Services; Soil Erosion/Compaction/Grading; Water Quality

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Reviewing Agencies Resources Agency; Department of Parks and Recreation; Native American Heritage Commission; Office of Historic Preservation; Department of Fish and Game, Region 2; Department of Water Resources; Department of Conservation; California Highway Patrol; Caltrans, District 3; Caltrans, Division of Aeronautics; Tahoe Regional Planning Agency; State Water Resources Control Board, Division of Water Rights; State Lands Commission

---

Date Received 02/05/2008 **Start of Review** 02/05/2008 **End of Review** 03/21/2008

Note: Blanks in data fields result from insufficient information provided by lead agency.

STATE OF CALIFORNIA Arnold Schwarzenegger, *Govemor*

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082
(916) 657-5390 - Fax

RECEIVED
FEB 13 2008
By AH

February 11, 2008

Anne Holden
California Regional Water Quality Control Board-Lahontan Region
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150

RE: SCH# 2008022021 Middle Truckee River Watershed Total Maximum Daily Load (TMDL):Basin Plan Amendment: Placer, Nevada and Sierra Counties.

Dear Ms. Holden:

The Native American Heritage Commission (NAHC) has reviewed the Notice of Completion (NOC) referenced above. The California Environmental Quality Act (CEQA) states that any project that causes a substantial adverse change in the significance of an historical resource, which includes archeological resources, is a significant effect requiring the preparation of an EIR (CEQA Guidelines 15064(b)). To comply with this provision the lead agency is required to assess whether the project will have an adverse impact on historical resources within the area of project effect (APE), and if so to mitigate that effect. To adequately assess and mitigate project-related impacts to archaeological resources, the NAHC recommends the following actions:

- ✓ Contact the appropriate regional archaeological Information Center for a record search. The record search will determine:
  - If a part or all of the area of project effect (APE) has been previously surveyed for cultural resources.
  - If any known cultural resources have already been recorded on or adjacent to the APE.
  - If the probability is low, moderate, or high that cultural resources are located in the APE.
  - If a survey is required to determine whether previously unrecorded cultural resources are present.
- ✓ If an archaeological inventory survey is required, the final stage is the preparation of a professional report detailing the findings and recommendations of the records search and field survey.
  - The final report containing site forms, site significance, and mitigation measurers should be submitted immediately to the planning department. All information regarding site locations, Native American human remains, and associated funerary objects should be in a separate confidential addendum, and not be made available for pubic disclosure.
  - The final written report should be submitted within 3 months after work has been completed to the appropriate regional archaeological Information Center.
- ✓ Contact the Native American Heritage Commission for:
  - A Sacred Lands File Check. **USGS 7.5-minute quadrangle name, township, range, and section required.**
  - A list of appropriate Native American contacts for consultation concerning the project site and to assist in the mitigation measures. **Native American Contacts List attached.**
- ✓ Lack of surface evidence of archeological resources does not preclude their subsurface existence.
  - Lead agencies should include in their mitigation plan provisions for the identification and evaluation of accidentally discovered archeological resources, per California Environmental Quality Act (CEQA) §15064.5(f). In areas of identified archaeological sensitivity, a certified archaeologist and a culturally affiliated Native American, with knowledge in cultural resources, should monitor all ground-disturbing activities.
  - Lead agencies should include in their mitigation plan provisions for the disposition of recovered artifacts, in consultation with culturally affiliated Native Americans.
  - Lead agencies should include provisions for discovery of Native American human remains in their mitigation plan. Health and Safety Code §7050.5, CEQA §15064.5(e), and Public Resources Code §5097.98 mandates the process to be followed in the event of an accidental discovery of any human remains in a location other than a dedicated cemetery.

Sincerely,

Katy Sanchez

Katy Sanchez
Program Analyst

CC: State Clearinghouse

Native American Contacts
Placer, Nevada and Sierra Counties
February 11, 2008

Rose Enos
15310 Bancroft Road — Maidu
Auburn , CA 95603 — Washoe
(530) 878-2378

Washoe Tribe of Nevada and California
Waldo Walker, Chairperson
919 Highway 395 South — Washoe
Gardnerville , NV 89410
waldo.walker@washoetribe.us
775-265-4191
775-265-6240 Fax

Washoe Tribe of Nevada and California THPO
Lynda Shoshone, Cultural Resources
919 Highway 395 South — Washoe
Gardnerville , NV 89410
wthpo@yahoo.com
(775) 265-7274
(775) 265-2254 FAX

This list is current only as of the date of this document.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resources Code and Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native Americans with regard to cultural resources for the proposed SCH# 2008022021 Middle Truckee River Watershed Total Maximum Daily Load (TMDL), Basin Plan Amendment;Placer, N evada and Sierra Çounties.

Anne Holden - Initial EPA comments concerning Truckee River TMDL impairment

From: <Landy.Jacques@epamail.epa.gov>
To: <aholden@waterboards.ca.gov>, <bamorfini@waterboards.ca.gov>, <lkemper@waterboards.ca.gov>
Date: 4/9/2008 1:13 PM
Subject: Initial EPA comments concerning Truckee River TMDL impairment

Hello All,

Following are my comments concerning the threshold question of whether or not the Truckee River segment under consideration is impaired, and therefore whether a TMDL is required for this segment under CWA Section 303(d).

EPA considers that the weight of evidence concerning sediment impairment, including information presented in the draft TMDL on suspended sediment and turbidity water quality data as well as biological monitoring results, supports the listing of the Truckee River between Lake Tahoe and the California-Nevada stateline as water quality-limited, and the development of a sediment TMDL for this segment. Although consideration of only the 1969-2002 USGS grab sample turbidity data set at Farad might lead to the conclusion that the Truckee River at this location was not yet impaired during that period, EPA agrees that other information, including more recent continuous turbidity monitoring and suspended solids water quality data at Farad, as well as biological monitoring throughout the Truckee River watershed, supports the impairment determination.

The evaluation of suspended sediment data based on the judgment that 25 mg/l TSS/SSC (as a 90th percentile of annual datasets) causes adverse impacts to aquatic life is consistent with EPA guidance and the preponderance of information concerning aquatic life impairment. Of the 27 years for which SSC data are available, this target value is exceeded six times (over twice the 10 percentile allowable). Furthermore, if the first and second halves of the dataset are considered, there are twice as many years in exceedance in the more recent half than in the first half of the period of record.

Furthermore, this numeric target is consistent with applicable water quality standards for total suspended solids adopted by the State of Nevada for the Truckee River just downstream of Farad.

Please let me know if you have any questions concerning these comments. I am prepared to provide additional comments concerning the draft TMDL upon my return to the Tahoe Basin next week, though I understand that is after your deadline for compiling comments and responses for the Board's consideration.

Thanks,
Jack

Jack Landy
U.S. EPA Lake Tahoe Basin Coordinator
c/o TRPA
P. O. Box 5310
Stateline, NV 89449
tel: (775) 589-5248
fax: (775) 588-4527
e-mail: landy.jacques@epa.gov

Middle Truckee River Watershed Total Maximum Daily Load for Sediment
Placer, Nevada and Sierra Counties

Responses to Additional Public Comments

Prepared by Lahontan Water Board staff
April 28, 2008

Water Board staff received the following comments from Barry Hill, US Forest Service Regional Hydrologist, dated April 24, 2008. He submitted these comments after reviewing our responses to his first set of comments on the public review draft TMDL.

Water Board staff's responses are in **bold** font.

Comment 1: The USDA Forest Service (USFS) is responsible for the management of national forest resources for the benefit of the public. Our responsibilities include wildland fire control, fuels reduction, and protection of water quality. An accurate and reasonable calculation of the TMDL load reduction is of great importance to the USFS because of potential requirements to expend appropriated funds to meet the calculated TMDL load reduction targets.

Response 1: To clarify the point regarding TMDL targets: the TMDL targets are not "load reduction" targets. Rather than attempting to measure and track sediment mass reductions throughout the watershed, the TMDL proposes to track in-stream suspended sediment concentrations and implementation activities that should result in reducing sediment loads such that the in-stream SSC target is achieved over time. This concept is stated in the Final Draft TMDL staff report:

> **"The sediment loading reduction and loading capacity are estimated here only to give a relative sense of the watershed-wide improvements needed to protect water quality and beneficial uses. The success of the Truckee River Watershed TMDL will not be directly measured by sediment mass loading reductions, because that is not a practical indication of beneficial use protection due to the inherent natural variability of sediment delivery and the uncertainties associated with accurately measuring sediment reduction. The practical benchmarks to determine if desired conditions (and thus, the loading capacity) are achieved are the TMDL targets that measure sediment conditions in-stream, and watershed-wide sediment control actions (p.6-2, TMDL staff report)."**

Comment 2: An inaccurate and overestimated load reduction calculation has the potential to divert our efforts from activities that would better serve the public.

<u>Response 2:</u> Comment noted. The estimated 20 percent load reduction is consistent with observed magnitude of sediment impairment in the Truckee River, which indicates that large reductions are not needed to protect beneficial uses. According to EPA (1999), "relatively modest" reductions are in the range of 10 to 20 percent (p. 6-4). While this may be a conservative estimate of needed reductions, we do not believe it is "overestimated."

<u>Comment 3:</u> Your response to my earlier comments states that the TMDL load reduction calculation follows USEPA (1999) guidance. I have not been able to find any support for this statement in the USEPA (1999) document. The example of a load reduction calculation on page 6-5 of the USEPA guidelines clearly shows that existing conditions, as determined from sediment indicators, must be compared to target conditions expressed in units of load or an equivalent. This is an appropriate approach, and requires information on existing sediment loads as well as target conditions. The USEPA (1999) guidance is clear that all available data should be used to determine existing conditions, and does not provide any indications that the data should be divided based on time.

<u>Response 3:</u> We disagree that our method of estimating the load reduction is not supported by USEPA guidance. Page 6-5 of US EPA's 1999 *Protocol for Developing Sediment TMDLs* shows one <u>example</u> of calculating needed reductions using existing and target sediment measures. To illustrate this concept, USEPA's example uses sedimentation indicators of percent fine sediment, median particle size, and average pool depth. None of these measures are in units of load (i.e., tons per day). The target conditions for these indicators, likewise, are not specified in units of load. For most sediment TMDLs, indicators and target values are typically not expressed in units of load, due to the inherent natural variability of sediment delivery and the uncertainties associated with accurately measuring sediment reduction. However, TMDL regulations require that load reductions and the load capacity (i.e., the TMDL) are expressed quantitatively, despite the difficulties associated with those quantitative estimates.

Nevertheless, the example is presented by USEPA to illustrate the concept of using existing and target conditions to estimate a load reduction, not to prescribe a single acceptable approach. In the Truckee River TMDL, we used a similar method as the USEPA, by comparing existing and target suspended sediment concentrations on an annual basis, and applying the difference between the target and existing to the estimated annual sediment loading. This is consistent with USEPA's example, but using the data that were available to us. Regarding our method of considering the SSC data in annual increments, please see our response to comment 4 in this document, and comment 1.20 in our previous responses to public comments.

Comment 4: Rather than follow the USEPA recommended approach, the authors of the TMDL report instead computed the load reduction by 1) dividing sediment-concentration data for the 27-year period of record into annual values, 2) determining the percentage of years during which sediment concentrations exceeded a threshold value, and 3) applying this percentage to the estimated annual sediment load for an "above average" and "worst case" year. This approach is inappropriate because it applies a percentage of time (years) to a reduction in load (tons) for a single year. This approach cannot provide any information on the magnitude of threshold exceedance or required load reduction.

Response 4: Typical aquatic life water quality criteria statement contains three components, as recommended by USEPA (1991, pp. 31-32[1]):

- **Magnitude: how much of a pollutant, expressed as a concentration, is allowable**
- **Duration: the period of time (averaging period) over which the in-stream concentration is assessed for comparison with criteria concentrations. This specification limits the duration of concentrations above the criteria**
- **Frequency: how often criteria can be exceeded**

The SSC target in the TMDL contains these three components: the magnitude is 25 milligram per liter, the frequency (of allowable exceedance) is 10 percent, and the duration is annually. Nowhere in USEPA (1999) does it state that comparison of existing to target conditions should be based only on the *magnitude* component of the target, as the commenter implies. We agree that examples given in EPA (1999) often show magnitude-type comparisons, most likely because that type of comparison provides the simplest illustration of the concept. However, as noted above, USEPA uses three different indicators that incorporate measurement units of millimeters, and apply the percent differences of those measures to a load of tons per square mile. We have undergone a similar analysis, except using years (or duration), as explained in response 3.

Comment 5: The commenter provides a hypothetical example (attached) with the following explanation: Scenarios A and B are identical except for the loads during years 4 and 9. The loads for these years exceed the water quality objective (WQO) for both scenarios, but by much different amounts. The load reduction calculation approach used in the TMDL, based on 2 of 10 years having loads above the WQO, would result in a required load reduction of 20% for Scenario A even though the average annual load is only 59% of the WQO. Conversely, the load reduction calculation would result in an allocation, or "allowable" load, of 43,840 tons in Scenario B, more than 40 times higher than the WQO. These results indicate that the approach used to compute the load

[1] Technical Support Document for Water Quality-based Toxics Control. Office of Water. EPA/505/2-90-001, PB91-127415. March 1991

reduction for the middle Truckee TMDL does not provide an appropriate measure of needed improvement in water quality or the effort and expense needed to address water-quality impairment.

Response 5: Water Board staff cannot comment on the technical validity of the hypothetical scenarios, as the derivation of the scenarios is unclear given the information presented. It is also unclear how the scenarios relate to the Truckee River TMDL analysis. However, we note that the TMDL will not track an "annual load allocation" based on the 20 percent estimated reduction, as the hypothetical scenarios suggest, nor does the water quality objective (meaning, we assume, the SSC target) result in a mass based allocation that will be tracked or used to assess TMDL attainment. Rather, the TMDL proposes to track the annual 90th percentile SSCs (not loads), along with implementation activities, to determine if the TMDL is met over time.

Comment 6: The appropriate procedure for computing the required load reduction following USEPA (1999) guidance would be to use all available scientifically valid data to determine the existing average annual sediment load, and compare the existing load to a scientifically credible threshold expressed in the same measurement units as the existing load. This approach, if applied to the middle Truckee River, would show that no load reduction is necessary.

Response 6: USEPA does not prescribe one acceptable method to compute a load reduction using an average annual sediment load, as the commenter states. Further, as noted above, the example given in USEPA (1999, p. 6-5) does not base reductions on a comparison of consistent measurement units.

The statement that a "zero" load reduction is appropriate to protect beneficial uses in the Truckee River is not scientifically defensible. Water Board staff's conclusion that sediment load reductions are needed to protect aquatic life in the Truckee River were supported by independent scientific peer review and the US EPA. The estimated twenty percent load reduction proposed in the TMDL is in the "modest" range (USEPA, 1999), and consistent with the magnitude of impairment observed in the river. It gives an appropriate sense of the needed improvement in water quality. The TMDL implementation plan provides an overview of the types of programs that will be used to implement the TMDL. For the USFS-Tahoe National Forest, the programs outlined are equivalent to the existing programs the USFS is already proposing in the Tahoe NF, and, as such, does not constitute undue effort or expense as suggested.

Comment 7: The data presented in the TMDL report itself confirm that existing sediment loads are below the selected threshold (see table 3-3 and figure 3-2 of the TMDL report) and therefore require no reduction. Similarly, the data in table 4-2 of the TMDL report show that the average of the 90th percentile sediment

concentrations for the period of record is 20 mg/L, which is less than the selected threshold of 25 mg/L. Table 4-2 also shows that for the "above average" 1996-97 water year, considered by the authors of the TMDL report to represent the "worst case sediment transport conditions (p. 5-20)," the WQO was not exceeded.

Response 7: This comment brings up two points that have been addressed in previous responses to USFS comments: 1) that the data in the TMDL report confirms that no load reduction is needed, and 2) that averaging the entire dataset over the period of record is an appropriate analysis to assess beneficial use protection. For responses to point 1 above, please response 6 above, and see our responses to comments 1.4, 1.6 and 1.9 in the previous public review comment and response document. For a response to point 2 above, see our response to comment 1.20 in the same document.

Comment 8: In summary, the load reduction computed for the middle Truckee sediment TMDL report is not supported by credible scientific data. If incorporated into an implementation plan, the proposed load reduction would result in an unnecessary burden on public resources that could be better used to address more critical natural resource management issues.

Response 8: We contend the load reduction estimated for the Truckee River TMDL is reasonable, defensible, and consistent with the weight-of-evidence observations of impairment in the river, as well as USEPA guidance. Scientific peer review supports this contention.

The estimated load reduction has been incorporated into the TMDL implementation plan. The implementation plan outlines general actions and programs that will be used to reduce sediment loading to the river. Where appropriate, we recommend "focus areas" for each program, to identify where Water Board staff should direct attention. For the USFS, we cite the Off-highway Vehicle (OHV) route designation program, and the Management Agency Agreement (MAA) between the State Water Board and the USFS. The MAA requires the USFS to implement the practices and procedures set in its *Water Quality Management for National Forest System Lands in California*. We recommend that Water Board staff focus on working with USFS staff to identify and prioritize problem areas on USFS lands where sediment transport to the Truckee River is most likely to occur, and to track and report progress on TMDL targets for dirt roads and legacy site restoration. In other words, implementation of the TMDL requires that the USFS-Tahoe NF continue to implement its existing sediment control and water quality protection programs, and to develop a method to track and report progress on these programs. It does not impose new regulatory requirements. This does not constitute an unnecessary burden on public resources.

From: Barry Hill <bhill@fs.fed.us>
To: <aholden@waterboards.ca.gov>
Date: 4/24/2008 4:18:01 PM
Subject: additional comments on Middle Truckee River sediment TMDL load reduction computation

Dear Ms. Holden:

I am providing the following additional comments on the Middle Truckee River sediment TMDL, in response to the April 17, 2008, letter from Lauri Kemper of the Lahontan Regional Water Quality Control Board staff.

The USDA Forest Service (USFS) is responsible for the management of national forest resources for the benefit of the public. Our responsibilities include wildland fire control, fuels reduction, and protection of water quality. An accurate and reasonable calculation of the TMDL load reduction is of great importance to the USFS because of potential requirements to expend appropriated funds to meet the calculated TMDL load reduction targets. An inaccurate and overestimated load reduction calculation has the potential to divert our efforts from activities that would better serve the public.

Your response to my earlier comments states that the TMDL load reduction calculation follows USEPA (1999) guidance. I have not been able to find any support for this statement in the USEPA (1999) document. The example of a load reduction calculation on page 6-5 of the USEPA guidelines clearly shows that existing conditions, as determined from sediment indicators, must be compared to target conditions expressed in units of load or an equivalent. This is an appropriate approach, and requires information on existing sediment loads as well as target conditions. The USEPA (1999) guidance is clear that all available data should be used to determine existing conditions, and does not provide any indications that the data should be divided based on time.

Rather than follow the USEPA recommended approach, the authors of the TMDL report instead computed the load reduction by 1) dividing sediment-concentration data for the 27-year period of record into annual values, 2) determining the percentage of years during which sediment concentrations exceeded a threshold value, and 3) applying this percentage to the estimated annual sediment load for an "above average" and "worst case" year. This approach is inappropriate because it applies a percentage of time (years) to a reduction in load (tons) for a single year. This approach cannot provide any information on the magnitude of threshold exceedance or required load reduction. The hypothetical example shown below illustrates this problem:

(Embedded image moved to file: pic12142.jpg)

Scenarios A and B are identical except for the loads during years 4 and 9. The loads for these years exceed the water quality objective (WQO) for both scenarios, but by much different amounts. The load reduction calculation approach used in the TMDL, based on 2 of 10 years having loads above the WQO, would result in a required load reduction of 20% for Scenario A even though the average annual load is only 59% of the WQO. Conversely, the

load reduction calculation would result in an allocation, or "allowable" load, of 43,840 tons in Scenario B, more than 40 times higher than the WQO. These results indicate that the approach used to compute the load reduction for the middle Truckee TMDL does not provide an appropriate measure of needed improvement in water quality or the effort and expense needed to address water-quality impairment.

The appropriate procedure for computing the required load reduction following USEPA (1999) guidance would be to use all available scientifically valid data to determine the existing average annual sediment load, and compare the existing load to a scientifically credible threshold expressed in the same measurement units as the existing load. This approach, if applied to the middle Truckee River, would show that no load reduction is necessary.

The data presented in the TMDL report itself confirm that existing sediment loads are below the selected threshold (see table 3-3 and figure 3-2 of the TMDL report) and therefore require no reduction. Similarly, the data in table 4-2 of the TMDL report show that the average of the 90th percentile sediment concentrations for the period of record is 20 mg/L, which is less than the selected threshold of 25 mg/L. Table 4-2 also shows that for the "above average" 1996-97 water year, considered by the authors of the TMDL report to represent the "worst case sediment transport conditions (p. 5-20)," the WQO was not exceeded.

In summary, the load reduction computed for the middle Truckee sediment TMDL report is not supported by credible scientific data. If incorporated into an implementation plan, the proposed load reduction would result in an unnecessary burden on public resources that could be better used to address more critical natural resource management issues.

Thank you for the opportunity to provide further comments. If you have any questions, please contact me.

Sincerely,

Barry Hill

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Barry Hill
Regional Hydrologist
USDA-Forest Service
Pacific Southwest Region
1323 Club Drive
Vallejo, California 94592
707-562-8968 (office)
bhill@fs.fed.us
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CC: Joanne B Roubique <jroubique@fs.fed.us>, Carol A Kennedy <ckennedy@fs.fed.us>, Chris Knopp <cknopp@fs.fed.us>, <landy.jacques@epa.gov>

Hypothetical measured annual loads in tons for 2 scenarios:

Year	Scenario A	Scenario B
1	45	45
2	890	890
3	120	120
4	**1,100**	**54,800**
5	980	980
6	650	650
7	450	450
8	35	35
9	**1,300**	**34,800**
10	340	340
total	5,910	93,110
average annual load	591	9,311
"worst case" load	1,100	54,800
20% reduction	220	10,960
annual load allocation	880	43,840

Assume year 4 is "worst case above average" year
Hypothetical water quality objective (WQO) is 1,000 tons
Annual loads above WQO are in **bold**
Load allocations = "worst case" loads - 20% reductions