APPENDIX K: RESPONSE TO PUBLIC COMMENTS

Seven individuals/organizations submitted formal written comments. Their comments have been summarized/paraphrased and organized below by primary topic heading. Responses prepared by MDEQ follow each of the individual comments. The original comment letters are located in the project files at MDEQ and may be reviewed upon request. Where specific modifications to the document have been made in response to comments, they are noted in the responses.

In addition to the comments below, several general comments that mainly included grammatical errors and missing references were addressed by modifying the final document. These comments were addressed and are not summarized below.

1. Executive Summary, Regulatory Framework and Watershed Characterization (Sections 2.0 and 3.0)

Comment 1.1

The proposed removal of Seeley Lake and Salmon Lake from the 303(d) list of impaired waters appears premature and inaccurate based on recent human development activity around the water body, increases in recreational use, and observed water quality deficiencies which exceed Montana standards. The outlet arm of the lake regularly exceeds Montana standards for turbidity and TSS due to high volumes of speed boat and recreation traffic. As a result, visible increases in turbidity are evident in the Clearwater River from Seeley Lake to the Morrell Creek confluence. Missoula County photo documentation has also confirmed the gradual encroachment of infrastructure around the lakeshore and conversion of native riparian vegetation to manicured lawns along the lake perimeter and Clearwater River at the outlet (Missoula County Office of Planning and Grants, Missoula County Conservation District). The city of Seeley Lake is also experiencing rapid human population growth and is planning for modifications or upgrades to its septic treatment system near Morrell Creek. This stream is a direct tributary of the Clearwater River just upstream of Salmon Lake. Therefore, I would not recommend removing either lake from the list.

Response 1.1

> The development of TMDLs relies upon an assessment of the water quality data record for specific pollutants compared to water quality standards and the resulting impairment listing concluded by MDEQ's Monitoring and Assessment program. The assessment record for Seeley Lake cites studies from the early 1970's and the mid 1990's that reported that water quality for nutrients, dissolved oxygen, and Secchi depth appeared fairly constant during this period. The total phosphorus concentration reported in the more recent studies was lower than reported in the 1970's. This improving trend from the 1970s through the mid 1990s is stated in the assessment record as the reason for the current Seeley Lake listing of full support.

The impairment status of Seeley Lake was last updated by MDEQ in 1999. Water quality data has been collected on Seeley Lake since that time and, once reviewed by the staff of MDEQ's Monitoring and Assessment program, the future listing status could change. In addition, water quality monitoring and assessment protocols have evolved since 1999 and an updated assessment of Seeley Lake using updated methods could describe use support differently than in 1999

The assessment record from 1999 acknowledges that excessive nitrogen inputs from shoreline septic systems could alter the lake's water quality. A fish consumption advisory was issued for rainbow trout in Seeley Lake based on 1992 and 1993 data for PCB in fish tissue. A detected concentration of 0.06 parts per million (ppm) just exceeded the 0.05 ppm fish tissue threshold for PCB. Water quality concentrations of PCB that would result in this low level of accumulation are not likely to exceed acute or chronic water quality standards. Indeed, the water quality data record does not contain a result for PCB that exceeds the standards.

The 1996 listing of Salmon Lake for nutrients, organic enrichment, and siltation stemmed from fish surveys from the 1950s through the 1970s that indicated higher than normal numbers of non-game fish. Nutrient concentrations measured since the mid-1980s appear normal. Although summer algal blooms have observed in recent years and have apparently led to fish kills, cause and effect documentation is lacking.

The impairment status of Salmon Lake was last updated by MDEQ in 2005 and includes the interpretation of nutrient data collected in 2003 and 2004. Total nitrogen values averaged 0.177 mg/L from six sampling events; the samples had a mean total phosphorus concentration of 12 µg/L. These values do not represent elevated nutrients in the lake. The degree of shoreline human influence indicates some impairment but the suppressed fishery is thought to be more related to the illegal introduction of northern pike than excess sedimentation.

Although Seeley and Salmon lakes were not mentioned specifically in the adaptive management strategy for nutrients **(Section 9.3.5)**, the discussion acknowledges the shortfalls in the current understanding of nutrients in the Blackfoot River watershed, including the Clearwater River watershed, and recommends a strategy to address the data shortfalls.

Comment 1.2

Salmon Lake and Seeley Lake are considered fully functioning without adequate current data. Therefore, I request that the restoration plan include planning for a non-growing season nutrient evaluation and chemical contamination monitoring. Temperature evaluations also need to be included for these lakes. There are many public water supply system violations for sources in the Seeley Lake area. Lake monitoring should include the constituents named with these violations. MDEQ needs to examine these lakes for nutrients, organic enrichment, Coliform, HAA5, Arsenic, Mercury and Organochlorides. I suspect TMDLs will be needed in some of these categories. The restoration plan should include an expanded discussion that addresses planning for evaluations and monitoring in these lakes.

Tote Road Lake has a history of chemical spills and clean-up activities and subdivision development is planned in the near future. The lake does not appear on the list of impaired waters. I would like to see the TMDL document include plans for a review of water quality in Emerald Lake and the Fish Creek watershed.

Lower Clearwater River appears as a 303d stream on many of the maps and appears on several tables in **Section 5.0** and in some appendices. **Section 2.0** needs to include a preliminary discussion of this stream segment and **Section 10.0** needs to provide a TMDL calculation and long term planning for the Lower Clearwater River 303d segment erosion/sediment, nutrients and temperature parameters. In **Section 10.0**, it would be appropriate to include a plan to evaluate nutrients and organics during a non-growing season period, particularly in the lower reaches of this stream.

The entry for Blanchard Creek in **Table 2-1** of the report shows that the primary contact recreation is N, but the text in **Section 5.0** indicates that this classification is a P. This should be reviewed to insure **Sections 2.0 and 5.0** are consistent. In **Section 10.0**, please include a plan to evaluate nutrients and organics during a non-growing season period, particularly in the lower reaches of this stream.

Analysis of the combined potential impact of the recent (2007) fire, associated salvage logging, existing housing, and proposed housing (820 units being discussed by the community) in the Placid Creek watershed may make it necessary for MT DEQ to plan for additional sampling in the watershed, including Placid Lake.

Buck Creek was listed as impaired in 1996, and the current planning document implies this is no longer the case. There appears to be a lack of data or evidence of remediation to support a fully functioning classification. **Table 2-1** shows the status for Buck Creek, and indicates that there are not sufficient data. In **Section 2.0** it states that DEQ could not sample in 2004 due to dry channel conditions; for consistency, please include that statement on page J-9 in the next to the last paragraph. MT DEQ needs to obtain data before this stream can be considered fully functioning.

Seasonal dewatering of Owl Creek occurs. I request that DEQ include mention of the Owl Creek flow limitation in **Section 2.0** and propose the appropriate remediation planning in **Section 10.0**.

Deer Creek was classified as threatened in 1996 due to non-priority organics and sediment. No subsequent data are referenced. **Table 2-1** implies there are data available to make the change to fully and partially functioning calls in that table. However, there is a statement that Deer Creek was removed from subsequent lists due to a lack of sufficient data (SCD). There is a sediment TMDL proposed which may be based on modeling or other assumptions (footnotes should identify real and modeled data). **Section 5.0** talks about meeting targets, periphyton samples etc. Please clarify the real situation with the Deer Creek data. If data are available, please cite the sources. If they are not it would seem that some data collection would be an important step before there are changes in classifications of water quality status. In **Section 10.0**, should include a plan to evaluate nutrients and organics during a non-growing season period, particularly in the lower reaches of this stream.

The background information in **Section 2.0** indicates that Richmond Creek was listed as (threatened) for the cold water fishery in 1996; other issues were not considered due to a lack of data. **Section 10.0** identifies sources of erosion and possible remediation but claims no monitoring needs. Please include in **Section 10.0** any plan to evaluate nutrients and organics during a non-growing season period, particularly in the lower reaches of this stream.

The data summary for the West Fork Clearwater River presented in **Section 2.0** indicates that the cold water fishery is fully supported. I question this determination from my own experience and collaboration with Montana Fish Wildlife and Parks and the University of Montana in current studies. Montana Fish Wildlife and Parks has unpublished temperature data for the 2007 field season that shows summer temperatures were clearly marginal for bull trout. Ongoing graduate student research has documented very high bull trout spawner mortality for that area as well. I believe that in addition to the sediment TMDL proposed for the West Fork Clearwater River (**Section 9.0**), there may also be a need to examine water temperature and nutrients in this watershed. The classification of "Partial" in the Primary Contact Recreation category due to elevated Chl-*a* values implies the need to look at nutrients. Please include in **Section 10.0** a plan to evaluate nutrients and organics during a non-growing season period, particularly in the lower reaches of this stream. **Section 10.0** should include a monitoring or data collection component.

While the lower Clearwater River between Seeley and Salmon lakes has not been listed as a 303d stream in the past, this reach was very low during the summer of 2007. It is unlikely that this river segment was "fully supporting" because water temperatures. At least one bull trout redd was observed by MFWP biologists and me in this river segment during a period when water temperatures would have been lethal to embryos; this may warrant further investigation by MT DEQ. Sediment, discharge, and temperature issues may exist in this reach as well, particularly because of the reduced flows in this stream segment.

Response 1.2

The justifications for the removal of the 1996 impairment listings for Seeley and Salmon lakes can be obtained by examining the assessment record for these water bodies. This information is available to the public at the Clean Water Act Information Center located at the following link: http://deq.mt.gov/cwaic/. The information is summarized above in the response to Comment 1.1. Also see the response to Comment 1.1 above regarding the PCB fish consumption advisory.

Of the 28 public water supply violations listed in the comment, 26 violations were monitoring violations for "regular" or "major" parameters. Monitoring violations result from a failure to complete required monitoring for a specific constituent. They do not address intake water quality. The remaining two "MCL average" violations were due to exceeding a specific maximum contaminant level (MCL) for "5 haloacetic acid", referred to as "HAA5". This chemical is a disinfection byproduct that results from treatment with chlorine. The violation is not evidence of a standards violation for intake water. High source water levels of total organic carbon (TOC) can cause the MCL for HAA5 to be exceeded in treated water. Naturally occurring concentrations of TOC in surface waters often require settling or filtration in the treatment system prior to treatment with chlorine to reduce the concentrations of disinfection products such as haloacetic acid.

The Clean Water Act provides for periodic assessment of the nation's lakes and streams. The removal of the impairment listings for Seeley Lake is based upon a perceived long-term trend of static to improving lake water quality between the mid 1970s and the mid 1990s. The listing in 2006 is not based on the interpretation of lake assessment data collected by MDEQ in 2003 and 2004. A future interpretation of the most recent information and justifiable changes to levels of use support for Seeley Lake will be reflected in future assessment cycles. According to the assessment record for Salmon Lake, the delisting was based on a "good" set of nutrient data from the early 1980's, plus assessment data collected by MDEQ in 2003 and 2004.

The existing body of water quality data for the watershed is acknowledged as being sparse. The adaptive management strategy described in **Section 9.3.5.**1 specifically calls for collecting and compiling sufficient data to set up and calibrate a lake and stream response model for the entire watershed. This effort is intended to identify the location and relative importance of impairment causes, simulate water quality responses to existing and future conditions and plan for protective and remedial means to meet water quality standards. **Section 10.0** of the document has been edited to suggest monitoring for the Clearwater River Watershed.

Responses to Water Body-Specific Concerns in Comment 1.2

Lower Clearwater River - Assessment records have not been available for the lower Clearwater River for the listing cycles from 2000 through 2006. The current listing for the Clear water is "Not Assessed"; that is, sufficient credible data are not available to make a use support determination for the stream. This water body will be assessed by MDEQ's Monitoring and Assessment program during a future assessment cycle. The timing of the assessment is dependent upon workload, staffing level and funding.

The TMDL development process uses the current listing to identify the pollutant-water body combinations for which TMDLs are needed. Analysis of the water quality data to determine impairment status is a monitoring and assessment function that is outside the scope of TMDL development. If a water body is listed as "Not Assessed", it is assumed that sufficient, credible data are not available for an impairment listing and further data collection is needed. TMDLs will be developed in the future for the appropriate pollutants if impairment is concluded after collection and analysis of sufficient, credible data.

The figures in Appendix A depicting the Clearwater River as being impaired are incorrect and will be redrafted.

Blanchard Creek – **Section 5.0** wording has been revised to specify non-support (N) for contact recreation. **Section 10.0** has been revised to suggest the need for nutrient monitoring in lower Blanchard Creek.

Placid Creek – Placid Creek has not been listed as impaired on the 2006 303(d) list and so is not addressed in the document. Future assessments in the drainage would occur according to MDEQ's assessment schedule and available funding.

Buck Creek – The data for sediment target parameters collected from Buck Creek do not support development of a sediment TMDL on the stream. The impairment status of the stream and its degree of use support must await reevaluation of the data or collection of new data by MDEQ's monitoring and assessment program.

Owl Creek - Owl Creek has not been listed as impaired on the 2006 303(d) list and so is not addressed in the document. Future assessments in the drainage would occur according to MDEQ's assessment schedule and available funding.

Deer Creek – As a result of the 2006 listing for sediment, a sediment TMDL is developed for Deer Creek. The listing of partial support for contact recreation stems from the Chl-a concentrations measured in 2004. The current Chl-a target for primary contact recreation use support 100 mg/m^2) exceeds the values measured on Deer Creek (94.8 and 65.2 mg/m^2), implying that this use may not be impaired. The 2003 assessment by MDEQ concluded elevated fine sediment in channel substrate pebble counts and a sediment TMDL was developed. **Section 10.0** of the document has been edited to suggest monitoring of Deer Creek may be needed.

Richmond Creek - As a result of the current 2006 listing for sediment, a sediment TMDL is developed for Richmond Creek. The 1996 listing of Richmond Creek as "threatened" only indicates a possible negative trend in water quality. A "threatened" water body still provides support for beneficial use. **Section 10.0** of the document has been change to suggest monitoring of Richmond Creek may be needed.

West Fork Clearwater River - Data for the 2007 field season was not reviewed in the preparation of TMDLs for the West Fork or any other stream in the basin. This data will be incorporated in future assessment cycles. The review of additional data may result in additional impairment determinations for the West Fork of the Clearwater and other streams in the basin. **Section 10.0** of the document has been change to suggest that monitoring of the West Fork may be needed in the future.

Citations and references will be reviewed for consistency in the final document. Appendices C, D, E and J were available on line for databases relating to sediment. Though not listed for specific tributary streams, the entire nutrient data base is illustrated by points on load duration curves throughout **Section 9.3.** This approach was thought sufficient to show the general differences between target based loading and that based on the small amount of available nutrient data. Several report documents were referenced in developing TMDLS for sediment and temperature due to the large size of climate and hydrologic databases used for temperature modeling and calculating daily sediment loading. The cost of providing paper versions of these databases or providing a complete listings in the text prompted the use of these report references.

Comment 1.3

I am in favor of improving the general water quality standards for the Middle Blackfoot and Nevada Creek water shed. I will offer non scientific observations and comments about the Nevada Creek Reservoir as I am most familiar with this area and I believe it is underrepresented in the overall study.

I would like to draw attention to the potentially toxic Blue-green algae blooms (cyanobacteria) that occur seasonally from mid summer to late fall at the Nevada Creek Reservoir. The Montana Department of Environmental Quality warns that these algae blooms can occur in any lake, reservoir, stock pond or roadside ditch when conditions of warm water temperature, sunlight and nutrient loads are right. The Montana DEQ also warns that there is no easy way to determine if the water is toxic and that people should use common sense to avoid these areas when they have the unsightly algae blooms, as algae blooms can cause serious illness in humans and, more rarely, has killed pets, waterfowl, aquatic life, and other animals including livestock.

The draft (MB-NC WQRP) highlights some pollutants of concern at the Nevada Creek Reservoir as being sediment/siltation, dissolved oxygen, phosphorous, nitrogen and (seasonally) ammonia. The draft also points out that high water temperatures occur in upper portions of Nevada Creek and its tributaries just before reaching the reservoir. The unofficial campground, roadside pull-offs and general human recreation at Nevada Creek Reservoir also provide a quantifiable nutrient load not represented in the study in the form of solid and liquid human waste and bank erosion due to foot traffic and wave action from boats producing a wake.

It would seem that improving the water quality from harmful nutrients and warm temperatures both upstream and at the Nevada Creek Reservoir could potentially help reduce the annual algae bloom, thus reducing toxic health threats to humans, animals and invertebrates. I would recommend erecting signage at the unofficial boat ramp and the unofficial campground alerting people of the potential threats of Blue-green algae to themselves and their pets if there continues to be known human recreation at Nevada Creek Reservoir. It would also make sense to provide regulations on the recreational human impact in regard to camping and proper disposal of human waste and litter, and imposing a wake limit on boats to reduce the harmful effects of bank erosion and sedimentation/siltation of the reservoir due to wave action on such a small body of water.

Nevada Lake Reservoir is a unique and wonderful place for human recreation and wildlife to co-exist on into the future with minimal smart regulations. This area could benefit greatly from improved water quality; both for human safety and recreation, quality wildlife habitat and the general well being of the Middle Blackfoot-Nevada Creek watershed. I encourage your department to consider my comments and continue to collect more scientific data about this watershed to further enable wise decision making for the betterment of our collective area.

Response 1.3

Thank you for your concern and comment. The Department agrees that improving the water quality from harmful nutrients and warm temperatures both upstream and at the Nevada Creek Reservoir could reduce the algae concentrations and any associated health threat. Your suggestions for signage regarding waste and litter disposal will be forwarded to the Water Resources Division of the Montana Department of Natural Resources and Conservation, the operator of Nevada Lake.

Comment 1.4

The science behind this work is very inexact. I believe all assessments, impairments, allocations, targets, etc. should be interpreted very generally. As noted in the TMDL summary, much of the base line data for this report was based on only a few samplings. I know from personal experience in the valley that some of the streams listed on the 303D list are in no worse condition than other streams that are not listed on the 303D list. It would be a mistake to make judgments of one or two degrees here or a few parts per million there when the whole scientific approach is admittedly suspect. For example, the modeling work done with temperature was a very difficult to calibrate and apply. The DEQ personnel and consultants who did the work are the first to admit that in many cases the end conclusions are only a "best guess".

That said I feel that the general conclusions to come form this document are fair. It is fair to take a general look at this document to see what streams are compromised and what the major causes are. But it would be inaccurate to use this document to say to what degree any stream is compromised nor exactly how the problem should be allocated.

We can interpret this report in a general way to come to the conclusion that Nevada Creek is in need of improvement in several areas. Certainly metals, temperatures, nutrients and sediments are higher than they should be. We cannot say to what degree they are high nor point exactly to the cause. But we can interpret generally again and say, for example, that agriculture is a significant part of the pollution source and that better implementation of BMPs will help elevate the pollutions. For this reason the Restoration Action Plan portion of this document is a good start to improving the resources and habitat of this valley. If we can encourage producers to improve and maintain good shading and filter strips our stream will be in better shape. On the other hand treating this document as the "know all end all" to accurately identify and divide the blame would be very inaccurate and unproductive.

Response 1.4

MDEQ agrees with your assessment that the document should be interpreted generally. This approach is stated in the Executive Summary and other sections addressing the major pollutant categories.

Comment 1.5

What are the “liberal assumptions” used in determining the size of hillslope contributing area mentioned in the Executive Summary?

Response 1.5

Literature values for the slope length over which sheet wash erosion occurs vary from 100 to 400 feet. The use of 350 feet in the hillslope erosion estimate is toward the higher end of this range. An alternative approach would have been to use a mean or median value.

Comment 1.6

There are several water bodies where DEQ’s impairment decisions appear questionable, based on conflicting assessments and an apparent failure to follow standard procedures for beneficial use determinations. Richmond Creek, West Fork Clearwater River, and Deer Creek were initially identified by DEQ as fully supporting beneficial uses in the project QAPP (Dated November 2006), but were subsequently included on the 2006 Montana 303(d)/305(b) Integrated Report as requiring TMDLs. Because these streams were determined to be fully supporting their uses in the QAPP, no detailed phase II data were collected. Because of this, the TMDL assessments for these areas are relatively weak. Our review of the beneficial use determination assessment records for these waters, in the context of DEQ’s standard operating procedures for making beneficial use determinations, suggests that these streams are in fact fully supporting their uses. We ask that DEQ review our detailed comments for each of these water bodies, re-examine the information, and if you concur that these streams are in fact fully supporting that the TMDL document be modified to reflect this.

Response 1.6

The decision to re-list Deer and Richmond creeks was based upon the higher relative weight given the channel substrate conditions (as reflected in pebble count data) compared to the macroinvertebrate metric scores. The process for making such listing decisions is distinct from that for developing TMDLs. While public comments are welcome on any of MDEQ’s watershed programs, its helpful to recognize that definitive impairment listing decisions are beyond the scope of TMDL development. Watershed stakeholders, advisory committee members, consultants and the MDEQ staff preparing the planning documents do not finalize impairment listings but can make recommendations for specific assessment reviews. Buck Creek remains on the 303(d) list as impaired for sediment despite having met all Type I targets, two of three Type II targets and all supplemental indicators. A sediment TMDL was not developed for Buck Creek because the target departures did not indicate the need for reductions in controllable loading. Although the West Fork Clearwater is listed as fully supporting on the 2006 303(d) List, the nature of the target departures were similar to those for Deer Creek and Richmond Creek. Therefore a sediment TMDL was prepared for the West

Fork. The listing status for Buck Creek and the other Clearwater streams will be reviewed and revised during future assessment cycles.

Comment 1.7

The draft TMDL is ambiguous as to the status of Buck Creek. **Section 5.3**.16 states *"…Buck Creek is not considered as impaired for sediment and no sediment TMDL is proposed in this document*." However, a TMDL is in fact proposed for Buck Creek in **Section 9.0**. We request that DEQ sort out the situation for Buck Creek, and update the document accordingly.

Response 1.7

As discussed in Response 1.6 above, the target departures for Buck Creek indicate that sediment does not appear to be limiting use support. However, the impairment listing will remain until modified in a future assessment cycle. The inclusions of Buck Creek in **Table 9-6** and **Figure 9-3** are mistaken and have been corrected in the document.

2. Sediment and Habitat Impairments (Section 5.0)

Comment 2.1

It is not clear in **Section 5.5.1**, page 149, whether any field calibration or verification of input data occurred for the SWAT model computations addressing hillslope erosion. Was site specific field data or field observations used to calibrate model inputs? Were model inputs and outputs validated in anyway?

Response 2.1

Model parameters used in SWAT were calibrated for a period of record from 2002 to 2004 at four stream gaging locations. The calibration and validation procedures are described in **Appendix I**. **Tables I-3 and I-6** list the calibration and validation parameters and locations. Both the hydrologic and water quality data used for model calibration were field measurements (stream discharge) or analytical results for water samples collected at specific locations in the watershed.

Comment 2.2

The road erosion assessment does not adequately consider recent research on erosion rates in soil types common in the planning area. As such, predicted sediment delivery from roads is likely a factor of 3-10 times too high. We request that the TMDL acknowledge the new information, and that the results are likely conservatively high. This could be another aspect of the implicit Margin of Safety in the TMDL as well.

Response 2.2

The text describing the margin of safety for sediment TMDLs has been edited to cite the research by Sugden and Woods (2007). The difference in base erosion rates suggested by this research and the 10 tons per acre use in the sediment loading analysis is included as an additional margin of safety.

Comment 2.3

The SWAT modeling was unable to accurately represent hillslope erosion and deposition processes, and model output required further manipulation to reflect some semblance of reality. However, we believe the predicted rates of sediment delivery from hillslope erosion are still unrealistically high in that they do not comport with results of forest BMP audits and empirical data on watershed erosion rates in the Blackfoot. This is particularly so for the Deer Creek watershed, where hillslope erosion rates are estimated to be 60 tons/mi2/yr, which is nearly 30 times higher than predictions for adjacent forested watersheds with similar characteristics. We ask that DEQ acknowledge in **Section 5.5** that model outputs are highly suspect. We also ask DEQ to investigate (and as appropriate explain) why Deer Creek predictions are so different from nearby watersheds.

Response 2.3

It is acknowledged throughout the document that considerable uncertainty exists in the pollutant load estimates. A general statement describing the degree of uncertainty in loading estimates is contained in paragraph three of the Executive Summary. Appendix J explains that the hillslope estimates are not a realistic attempt at sediment budgeting. The high sediment estimates for Clearwater River basin streams are explicitly mentioned in the sediment TMDL margin of safety discussion. SWAT hillslope erosion estimates for Deer Creek and other Clearwater drainages are affected by the inclusion of a "forest roads" HRU in the model and the high delivery rates for this HRU.

The process of adaptive management that applies to all pollutant types provides a means of incorporating new information into future adjustments to TMDLs. Revisions to the SWAT watershed model or selection and calibration of an entirely different model for estimating pollutant loads and defining allocations are possibilities as new modeling tools become available and our understanding of loading processes improves.

Comment 2.4

The second paragraph of **Section 5.0** states that *"…Salmon Lake has been listed as impaired due to siltation since 1996*". We believe this statement is incorrect. In **Section 2.0**, Salmon Lake is listed as fully supporting beneficial uses on the 2006 Integrated Report.

Response 2.4

The sentence has been edited to state that both Nevada Lake and Salmon Lake have been listed as impaired due to siltation.

Comment 2.5

The TMDL document needs to better document the fact that the SWAT model yielded unsatisfactory results (this noted in Appendices I and J but not in **Section 5.0**), and predictions are likely to be grossly inaccurate.

Response 2.5

The limitations of the SWAT model have been given sufficient mention in the document. The model output and its modifications are not represented in the document as predictions. They are estimates made in an atmosphere of sparse analytical data, are acknowledged as such and are open to adjustment if necessary. Little would be gained by further delaying the final document with additional revisions to the estimates.

Comment 2.6

Road sediment delivery in the Deer Creek watershed was not summarized by RDG (2006). Plum Creek Timber Company (PCTC) conducted a complete inventory of all road sediment delivery locations in the Deer Creek watershed in 2002 (total of 46 locations), and assuming the DEQ's conservatively high base erosion rate of 10 tons/ac/yr, the predicted watershed wide sediment loading would be 30.5 tons/yr. As such, it is unclear how the 176 ton/yr estimated load for Deer Creek in **Table 5-55** was derived. This would imply average loading of 2.6 tons/crossing/yr, which is unrealistic and not consistent with the extrapolation averages in RDG (2006) Table IR-22. If sediment load allocation is made for Deer Creek, we ask that DEQ re-evaluate and correct the calculation for Deer Creek.

Response 2.6

The original calculation for Deer Creek mistakenly applied a mean per crossing loading value for geologic materials other than quaternary alluvial and glacial deposits that was higher than that specified by RDG in Table IR-22. The road sediment loads were recalculated for Deer Creek using the proper per crossing mean. The results are in the following table for 68 crossings in the Deer Creek watershed.

Ownership	Geology	Annual Precipitation (inches)	Per Crossing Load (tons/yr)	Number of Crossings	Loading (tons/yr)
U.S.F.S.	Erosive	≤ 26	2.0	3	6
U.S.F.S.	Erosive	>26	0.7	1	0.7
PCTC	Erosive	≤ 26	0.6	5	3.0
PCTC	Erosive	> 26	0.4	48	19.2
PCTC	Non-erosive	> 26	0.8	10	8
Other Private	Erosive	≤ 26	1.6	1	1.6
			Total	68	38.5

The resulting load total of 38.5 tons per year from road crossings in Deer Creek is a significantly lower estimate than the 176 tons given for Deer Creek in the document and the appropriate tables have been adjusted to reflect this recalculation.

Comment 2.7

It does not seem like streams which DEQ has determined to be fully supporting their uses should be included in **Sections 5.0 and 9.0**.

Response 2.7

The inclusion of unlisted streams and unlisted portions of the planning area into the loading discussions in **Sections 5.0 and 9.0** are intended to show that while beneficial uses are supported, there may be opportunities to further reduce loads in these areas that would improve use support in listed segments that are downstream. This is consistent with a watershed approach to TMDL development. The goal is to reduce loading throughout the impaired stream's watershed.

Comment 2.8

Sediment contribution from culvert failure is a legitimate source of sediment. However, the potential sediment risk from culvert failure analysis portrays sediment AT RISK rather than a known annual contribution. Culvert failures are episodic events and should not be accounted for in the same way as actual annual sediment contributions from sediment sources such as road surface erosion and highway sanding. Many culverts out there are undersized and have been in place for years and years and yet have never failed. The culvert failure analysis is better used to help prioritize culverts for removal and/or upgrade. A similar analysis was used in the Upper Lolo TMDL as a prioritization mechanism, but was, appropriately, not used to determine an annual load from culvert failures.

Response 2.8

EPA sediment TMDL development guidance for source assessment states that the basic source assessment procedure includes compiling an inventory of all sources of sediment to the waterbody and using one or more methods to determine the relative magnitude of source loading, focusing on the primary and controllable sources of loading (EPA 1999, page 5-1). Regulations allow that loadings "...may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading," (Water quality planning and management, 40 CFR § 130.2(I)). The analysis in this document uses a gross estimate approach to equate the load at risk to a yearly load making estimates of failure rate and failure amount when a given storm event exceeds a basic culvert design criteria. We acknowledge that the average yearly culvert failure loading values are gross estimates and can also be viewed as a load at risk. Using a load at risk approach would make it difficult to compare the relative contribution of culvert failures to other sediment sources and would make development of daily allowable loads a difficult task.

The vast majority of sediment loading, whether from roads or hillslope erosion, is derived and delivered to streams during episodic events. Models used for hillslope and road erosion loading use time step periods with loading, averaged over the time step period, weighted more heavily for some years than others. In fact, it is likely that many roads included within the source assessment would not contribute sediment loading to the stream during a typical year, but only deliver a sediment load during episodic events. This time step approach is consistent with EPA guidance (EPA 1999). Furthermore, the modeling and inclusion of average yearly loads from episodic events such as mass wasting is routinely incorporated into sediment TMDLs developed by or approved by EPA, including the Grave Creek TMDL in Montana (MDEQ 2005), the Lower Clark Fork River Subasin TMDLs in Idaho (IDEQ 2007), and the Garcia River sediment TMDL developed by EPA in California (USEPA 1998).

The MDEQ is constantly improving TMDL development methods, including source assessments, and will look at improving their methods for addressing source loading from culverts to ensure that the basic goals of TMDL source assessments, defined at the very beginning of this response to comments, are satisfied. Wording has been added to the discussion in **Section 9.1.4** to clarify the "at risk" nature of this potential loading source.

Comment 2.9

A key assumption in the culvert failure analysis is that on average, 1% of culverts fail annually. No basis for the 1% value is provided. We ask that the TMDL either provide justification for the 1% or note the value as an educated estimate in the document.

Response 2.9

Lacking detailed analysis of failure rates, the one percent value is an estimated point of departure for the purpose of calculating loads. The document text has been edited to clarify this assumption.

Comment 2.10

It is inappropriate to define culvert replacement with a structure sized to accommodate the Q100 as a "natural" rate of loading. Montana forestry BMPs require that culverts be sized to accommodate at least the 25-year flood. We do not believe that a federal standard (INFISH) is appropriate for other landowners. It has simply not been demonstrated that designing culverts to accommodate 25-year flood events will fail to protect beneficial uses. The Q100 is not considered a established reasonable practice by Montana's private landowners.

Response 2.10

Immediate replacement of all culverts not capable of passing the Q100 discharge is not anticipated. Upgrades will occur over time. A more reasonable approach may be to upgrade all culverts incapable of passing the most frequent flows or to replace those undersized culverts with the greatest amount of road fill at risk. The BMP recommends a minimum culvert capacity of 25-year. In addition, the BMP recommends designing crossings that have a minimum impact on water quality. Much of the forested portion of the planning area has high road densities. Water quality may be better protected in these areas by providing for more than the minimum design recommendation. The Q100 replacement is a road crossing BMP being implemented on some forest roads in Montana and it provides for a significant margin of safety for a source with a characteristically high degree of uncertainty. Although we do not cite a quantitative demonstration that the minimum culvert size criterion fails to protect beneficial uses, we are suggesting that more than the minimum BMP recommendation may be appropriate where sediment impairment is common and forest road crossing are numerous. In the context of adaptive management that applies to all of the TMDLs proposed in the document, the reduction estimated for this practice is open to future adjustment when data on loading from actual culvert failures is available for the Blackfoot River watershed.

Comment 2.11

The pools per mile target is not a good Type I target because it is influenced by more than simply sediment supply. Pools are highly variable among channel types, and in many cases the presence of Large Woody Debris (LWD). With certain channel types, pools may be sparse because of low LWD levels, which may be the result of a variety of reasons, both natural (floods, ice jams, shrub riparian types) and man-made (e.g., timber harvest, historic channel clearing for fish enhancement, etc.).

Response 2.11

The pools per mile target is a useful general indicator of sediment transport function. The targets have been stratified by both channel type and stream size (channel top width) to remove some of the variability due to these factors. The parameter will remain in the document as a Type I target. Future target adjustments are an option through adaptive management.

Comment 2.12

There is no adaptive management or monitoring section contained in the TMDL. This is traditionally a section in the TMDL. If one is included, the watershed stakeholders should have an opportunity to comment on it before being submitted to EPA.

Response 2.12

Adaptive management is addressed specifically in the margin of safety discussion for each pollutant category. Adaptive management is an important contribution to margin of safety. Describing it for specific to pollutant categories avoids a broader description less useful for those developing pollutant specific strategies for load reductions. Elements of Adaptive Management have also been integrated into the existing Evaluating Success Section (**10.4**)

3. Pollutant Loads and Allocations (Section 9.0)

Comment 3.1

The reductions in loads under the TMDL may not be possible everywhere. This is the case where significant road improvements have already been made over the past decade. We request that the TMDL acknowledge that the reductions may not be attainable everywhere, especially where road improvements have already been made.

Response 3.1

It is reasonable to expect that current BMP implementation is adequate in some locations and wording to this effect has been inserted into the sediment margin of safety discussion.

Comment 3.2

In **Section 9.1.7**, the explanation for allocating total modeled sediment loads simply says that it was done by land use. Please provide more details. What land use classification was used? If 86% of a watershed was in forestry/silviculture land use was 86% of the total modeled load for that watershed contributed to silviculture? (See comment below for **Section 10.0**).

Response 3.2

Section 9.1.7 further explains that for hillslope erosion, loading from land uses were assumed for specific cover types described by the 2001 USGS Landcover Dataset. The extent of these types in the watershed guided the hillslope allocations to land use. Field descriptions of vegetation conditions and the associated land uses were recorded during the stream bank erosion assessment and this information, in addition to ground and aerial photo interpretation, guided allocations of stream bank erosion to existing land use. The allocations are not based on a universally applied formula but reflected the extent and degree of land use effects on a stream by stream basis. Road erosion allocations were based upon expected improvements with BMP implementation.

Comment 3.3

PCTC

The naturally-occurring load for culvert failure is that load expected for culverts that are sized to pass the 100-year flood. It is unclear in Appendix J how this replacement scenario leads to a 70-80% reduction in annual loading. Please describe how this reduction is derived.

Response 3.3

Appendix J explains the basis for calculating culvert failure loading used in other studies of forested watersheds. An example is the analysis used for Prospect Creek in northwestern Montana. The analysis period for this example is 100 years, using a time step approach for source assessment consistent with EPA sediment TMDL guidance (EPA 1999). The road fill volume at risk with an event of a certain magnitude includes the volume at risk for all smaller events. In 100 years, a Q2 or greater flow event is likely to occur every two years or 50% of the time; a Q5 or greater event is likely to occur every 5 years or 20% of those 100 years; and a Q10 or greater event every 10 years or 10% of the time, and so on. The mass of fill (calculated from survey data) entering the channel for each event is multiplied by the probability of that event. The volume of fill at risk of failure over 100 years is calculated by adding the product values calculated for each recurrence interval. Culvert failure from storm events below the upgrade condition is assumed to occur once before the culvert is replaced. Failure at culverts less than the upgrade scenario is then assumed to occur once, plus one additional time where failure is likely to occur over 100 years. The load at risk associated with all culverts less than a Q100 is added to the total load at risk associated with Q100 failure. The difference in loading over a 100-year period between the same-size replacement scenario and the Q100 replacement scenario was a 77 percent reduction in this

Comment 3.4

The load reduction based on replacement of failed culverts with those capable of passing the Q100 event is in conflict with MCA 75-5-703 Paragraph 2, regarding consultation with local conservation districts and watershed advisory groups toward developing reasonable land, soil, and water conservation practices that specifically recognize established practices and programs for nonpoint sources.

Response 3.4

As noted in the response to Comment 3.3, the culvert design BMP includes minimizing impact to water quality. The approach does not represent a completely new practice given the fact that the forest industry upgrades many culverts above and beyond the 25 year event in bull trout watersheds. While consultation on load reductions for this source did not include input from all technical advisory committee members at the initial drafting, all advisory group members, as well as the public, have had the opportunity for input during the public comment period.

4. Water Quality Restoration Implementation and Monitoring Plan (Section 10)

Comment 4.1

The current package of Forestry BMPs in Montana, referenced on page 335, are not the product of voluntary practices (forestry management practices) developed by the 2006 BMP working group as stated in the document. In the text it states that: "The continued implementation of forestry management practices such as Streamside Management Zone (SMZ) practices, as well as the voluntary practices developed by the 2006 BMP working group should be applied in any existing or proposed silvicultural activities". Montana's Forestry BMPs were originally developed by the Cumulative Watershed Effects Cooperative (CWEC) under the direction of the Montana Department of State Lands (Forestry BMP programs are now administer under DNRC). The Environmental Quality Council (EQC) established a Best management Practices Technical Committee which reviewed the CWEC BMP package and adopted the package with minor editorial changes in 1989. The EQC sanctioned BMP package was adopted by DHES Water Quality Bureau in the Nonpoint Source Management Plan in 1991. Over the subsequent years the BMPs have been periodically reviewed and slightly revised by the DNRC directed BMP Workgroup. The most recent minor revisions occurred in 2006. The changes made to the BMPs are not considered to be substantive.

Response 4.1

The reference to the source of the forestry BMPs has been removed from the paragraph.

Comment 4.2

How has timber harvesting, described on page 336 and 337, been directly linked to habitat degradation in Blanchard Creek? This has not been clearly demonstrated in the text. How have disturbances associated with timber harvesting mentioned on page 336 been determined to be the primary cause of stream bank erosion in the upper reaches of Blanchard Creek? The text of document states that "The primary land use in upper Blanchard Creek has been timber harvesting, and disturbances associated with this harvesting activity are believed to be the primary cause of stream bank erosion on upper reaches of Blanchard Creek". The document does not disclose the basis of this "belief". Are these assumptions or beliefs supported by field data or have clear cause and effect mechanisms been observed or evaluated?

How was the contribution of hillslope erosion as a sediment source determined in Blanchard Creek? The text states that: "Another source of fine sediment is hill slope erosion which accounts for approximately 45% of the total controllable sediment load. Vegetation removal and soil disturbances in upland areas from livestock grazing practices are suspected as the primary cause of hill slope erosion in Blanchard Creek (**Section 9.0**)." Is the 45% hill slope erosion estimated from the SWAT model?

Response 4.2

Timber harvesting has not been directly linked to habitat degradation in the referenced pages. The text states that "The primary land use in upper Blanchard Creek has been timber harvesting, and disturbances associated with this harvesting activity are believed to be the primary cause of stream bank erosion on upper reaches of Blanchard Creek." No direct linkage is made in the statement. Since timber harvesting is the primary land use in upper Blanchard Creek, some of the stream bank erosion in the upper watershed could reasonably be attributed to timber harvest. A clear demonstration of causes and effect is more appropriate for more intensive, small scale erosion assessments that are not feasible in the context of TMDL development for a planning area as large as the middle Blackfoot planning area.

The SWAT model, as modified for use in the Middle Blackfoot-Nevada Creek planning area, was used to estimate hillslope erosion for the project. Forty tons of controllable hillslope erosion was estimated for Blanchard Creek. This is 23 percent of the total controllable load. The reference to 45 percent has been removed from the text.

Comment 4.3

The assessment discussed on page 338 assumes that historic logging has resulted in sediment delivery from steep hillslopes above Blanchard Creek. Recommendations include conservation measures to reduce sediment sources from hillslopes through the application of upland BMPs to reduce sediment production from historic timber harvest activities. Any future logging-related land management should include Forestry BMPs. What is the basis of the determination that upland hillslopes are a contributing sediment source?

Response 4.3

Hillslope erosion is an acknowledged source of sediment to streams. The basis for this position is the large body of erosion control literature that describes hillslope erosion processes and their effects on water quality. Chapter 15 of Dunne and Leopold (1978) provides a good overview of this topic. As discussed in the response to Comment 1.4 above, the conclusions of the sediment source assessment should be considered as first approximations that can be described in more detail after further, basin-specific investigation.

Comment 4.4

The discussion on page 339 needs to integrate the effects of the 2007 Jacko Lakes Wildfire into the assessment and recommendation for Buck Creek. Is the 4.5 tons/year attributed to roads still relevant in the post-fire environment? Surface erosion tends to spike the first year following fire depending on weather and then decline. How will allocations be modified in the future to incorporate sedimentation from large wildfires?

Response 4.4

Because of the uncertainty in the sediment source assessment, the reference to 4.5 tons per year from road erosion in Buck Creek is more useful when compared to other sediment sources in the basin. Control of road erosion in Buck Creek will remain relevant. Planned adjustments for future applications of sediment loading models to reflect fire include:

- Dates specified for fire occurrence;
- Alternate USLE curve numbers will be applied to fire affected HRUs;
- Alternate cover factor values will be applied to burned acreage;
- Surface soil content of nitrogen and phosphorus will be altered to reflect changes with fire;
- Return to pre-fire conditions will be simulated by condition decay coefficients inserted into program operations files.

The loads and allocations established in the document are meant to apply under median conditions of natural background and natural disturbance. Under some natural conditions, such as large wildfires or extreme flow events, it may not be possible to satisfy all targets, loads and allocations. The goal is to ensure that management activities are undertaken to achieve loading approximate to the TMDLs within a reasonable time frame and to prevent significant excess loading during recovery from significant natural events. These goals to not require recalculation of loads and allocations with each fire.

Comment 4.5

The discussion on page 347 needs to be updated to include the effects of the 2007 Jacko Lakes Wildfires that provide short term pulses of sediment that can exceed current baseline levels of sediment allocations. The cause and effect mechanism described may be insignificant or irrelevant under the post fire existing conditions. In the statement "The removal of vegetation in upland and riparian areas as well as the landscaped disturbances caused by timber harvesting has reduced sediment trapping and storage capabilities and increased sediment delivery to the stream.", what landscaped disturbances are being described?

Response 4.5

See response to Comment 4.4 above regarding integrating fire effects. In the context of timber harvesting, associated landscape disturbances could include vegetation clearing, skid trail formation and road construction.

Comment 4.6

The Jocko Lakes Fires burned much of the Buck Creek and Deer Creek drainages. The effects of this fire may include increased sedimentations, nutrients and temperature and runoff. I could not find in the document reference to fires and effects of fires on water quality (other than North Fork of the Blackfoot). It would be a good idea to include some fire-related discussion especially with respect to natural variation.

Response 4.6

See response to Comments 4.4 and 4.5 above.

Comment 4.7

The most notable recent landscape level wildfire in the North Fork of the Blackfoot Drainage, referred to on page 359, was the Canyon Creek fire in 1988, not 1998 as stated in the text.

Response 4.7

The data has been changed in the text to 1988.

Comment 4.8

The implementation plan (**Section 10.0**) seems overly detailed and repeats much of the information presented earlier in the document. We have two specific suggestions relative to the implementation plan. **Section 10.0** should be much more general in nature and should discuss Montana's nonpoint source management plan, Plum Creek's NFHCP, the Lolo Forest Plan, and other Blackfoot Challenge restoration efforts being undertaken across the planning area. On a watershed-specific level, a table/matrix could be constructed which would identify the applicable practices to meet the TMDL in each watershed. For example, in Blanchard Creek, various actions that could be "checked" in the table include: Implementation of the Plum Creek NFHCP, grazing management practices, forestry BMPs, SMZ law, irrigation BMPs, channel restoration, and comment on anything specific. This suite of "checked" boxes would vary from watershed to watershed depending on the issues. I see the detailed implementation plan (current **Section 10.0**) being appropriate as an appendix to the TMDL, and would essentially be a standalone document. This detailed restoration plan could then be periodically updated as new information becomes available, as well as documenting restoration actions that are taken over time.

Response 4.8

While the desire to shorten **Section 10.0** is understood, the individual treatment given to each stream was the approach preferred by the Blackfoot Challenge to set the stage for future restoration proposals and applications for funding. The suggestion of a matrix approach to the section is a useful one and will be considered in future revisions to the document.

Comment 4.9

The implementation plan (**Section 10.0**) seems much more detailed than needed. A matrix configuration is more suitable.

Response 4.9

See response to Comment 4.8 above.

Comment 4.10

In **Section 10.2.1.5**, first paragraph under "Suspected Sources and Causes" for Cottonwood Creek, the following statement is made: "…results of the sediment source assessment indicate that upland areas are the largest contributors of sediment to the stream. Sediment from hillslope erosion accounts for 86% of the controllable sediment load. Timber harvesting in the uppermost reaches is believed to be the cause of most hillslope generated sediment. Sediment produced from livestock grazing practices and hay production in the valley reaches accounts for 35% of the hillslope sediment load."

While modeling in the source assessment indicates this, I would hesitate to actually attribute 86%, 35% or whatever % of sediment supply to any source in particular for any one tributary.

Response 4.10

The TMDL process required that actual daily loads be calculated for each impaired segment and the percentages referred to in various **Section 10.0** discussions were likely part of those stream specific calculations. The uncertainty in the calculations is acknowledged in the discussion of the margin of safety for sediment TMDLs and the process of adaptive management is described as part of that margin. The acknowledgement of the uncertainty in all loading estimates throughout the document should prompt the reader toward a proper interpretation of any percentages mentioned in the section. The commenter's suggestion that caution should be used in referring to specific loading values and percentages figures in any single water body is valid considering the acknowledged amount of uncertainty in the loading estimates.

Comment 4.11

Add the following to the Lolo National Forest Section: "The Lolo National Forest is also committed to improving water quality in a variety of ways. Road BMPs are implemented for most all projects and through other general road improvements. Undersized stream crossings are being upgraded to better accommodate aquatic organisms, sediment, and debris and to reduce sedimentation. With each new project, existing roads are evaluated and unneeded roads may be scheduled for decommissioning. In the Middle Blackfoot the Lolo National Forest was a major partner for the Dunham Creek restoration project and is also helping to develop several other stream restoration projects with partners in the valley. Recently a new grazing management plan was completed for the Monture Creek grazing allotment. Forestry BMPs used by the Lolo National Forest on timber harvest and road projects are typically more stringent than the State of Montana's recommended forestry BMPs and required SMZ laws."

Response 4.11

The requested excerpt has been added to the discussion in **Section 10.3.2**.

REFERENCES

Idaho Department of Environmental Quality. 2007. Lower Clark Fork River Subbasin Assessment and Total Maximum Daily Loads. Coeur d'Alene Regional Office 2110 Ironwood Parkway Coeur d'Alene, Idaho 83814.

Montana Department of Environmental Quality. 2005. Grave Creek Watershed Water Quality and Habitat Restoration Plan and Sediment Total Maximum Daily Loads.

United States Environmental Protection Agency. 1998. Garcia River Sediment Total Maximum Daily Load. USEPA Region IX, March 16, 1998.

United States Environmental Protection Agency. 1999. Protocol for Developing Sediment TMDLs, First Edition. EPA 841-B-99-004.