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November 11, 2007

Mr. Dave Knight
WA State Dept. of Ecology
Water Quality Program
4601 N. Monroe St.
Spokane, WA 99205

Re: Comments on Draft Spokane River and Lake Spokane TMDL

Dear Mr. Knight:

Please accept the following comments on the Draft Spokane River and Lake Spokane TMDL. As the former TMDL Lead for this project, comments presented are based on in-depth technical knowledge and understanding of this TMDL.

This does not appear to be a reasonable or approvable TMDL Water Quality Improvement Plan because the "natural" water quality standard is not applied and the reasonable assurance requirement is not been met. Given that this TMDL is necessary because an earlier clean up plan implemented by Ecology since 1989 has proved to be inadequate (due to a non-conservative approach), it is even more important that this second attempt almost 20-years later address the problem head-on to ensure the water quality standard is finally attained. To address a problem head-on, however, requires that the situation be perceived for what it is. Unfortunately, this TMDL (v.2007) has undergone significant changes since its original release (v.2004), to be discussed below, that have served to distort the reality of the issue being assessed for purposes that will also be discussed. Without a realistic assessment, it does not seem possible that this Draft TMDL provides reasonable assurance, as required for approval, that it attain its goal to meet the water quality standard.

The policy decision by Ecology to incorporate ID Dischargers at their permit limits into the "natural" condition of the river is not adequately justified and appears to serve a win-win situation for the ID and WA Dischargers at the expense of a reasonable TMDL. The ID permit limits are based on EPA modeling that was performed to determine the permit loadings that *just cause* the allowable .20 mg/L DO degradation from the "natural" condition in Lake Spokane. However, this loading from ID that just causes the allowable degradation has now been incorporated into the "natural" condition and in effect removed from consideration, which has three significant effects.

First, it allows the WA Dischargers to also take the allowable .20 mg/L DO degradation below the "natural" condition now that ID discharges have been incorporated into the "natural" condition. Second, it lowers the water quality goal of the TMDL (to attain the "natural" condition) because the "natural" condition is now degraded by the incorporation of the ID Discharger loadings. Third, and most significantly, the increased loading to the "natural" condition completely shifts the results of the TMDL analyses in favor of the WA Dischargers, as presented in Attachment 1. Specifically, the results for the percentage NPS Load Reductions necessary to create capacity in the river for the WA Dischargers are now shifted downwards by 31 – 85 %, with an average downward shift of 60%. The significance of this shift is that it creates opportunities, albeit not

based on the reality of the situation, for WA Dischargers to create capacity in the river that were not previously present with the Draft TMDL v.2004. The reality of the situation that is not being presented or addressed is that ID Dischargers are taking the allowable 0.20 degradation, this leaves no assimilative capacity for the WA dischargers as a result, and the necessary NPS Reductions are actually higher.

As you will recognize, Attachment 1 is a summary table comparing the results of TMDL v.2004 to v.2007 that I developed while serving as the TMDL Lead for this project, and have recently updated with the most current results from PSU that were used to develop this Draft TMDL . Attachment 1 is being presented solely for comparative purposes and to show the effects of Ecology's policy decision to incorporate the contributions of the ID dischargers into the "natural" condition. This can be seen in the changes to both the "natural" condition and resulting NPS reductions. There are also changes to the "current" conditions, but these are the effects of updating the model with corrected flows for Hangman Creek and concentrations for the Little Spokane River and are not an issue.

While the above reveal my opinion that this Draft TMDL essentially is not reasonable because it fails to realistically assess the problem, it follows that my comments and technical analyses provided in the form of tables should not be construed as my condoning the results of the Draft TMDL in its current form.

As I have recommended in the past, the technical approach for the Draft TMDL v.2004 should not be abandoned. It was a realistic approach that provided reasonable results because it applied the "natural" water quality standard throughout its analysis, specifically through representation of more natural conditions at stateline that did not include the ID Dischargers. For this reason, the Draft TMDL v.2004 assessed the situation as it is, which is critical to the development of a clean up plan that provides reasonable assurance it will attain the water quality standard. By deviating from the Draft TMDL v.2004 specifically by incorporating the ID Dischargers at their permit limits into the "natural" condition, the new results have significantly shifted in a way that presents opportunities for the WA Dischargers that were not available before, as evidenced by the fact that it required a two-year collaborative effort to develop an alternative to the Draft TMDL v.2004 that the Dischargers could agree on.

While I'm fully aware that the train has left the station and this TMDL will be approved, it is my sincere hope that my efforts will somehow affect the changes that are needed now to develop a reasonable TMDL that approaches the problem realistically and provides reasonable assurance it can attain the water quality standard. The unfortunate alternatives are an appeal process or a second attempt by Ecology that is slated to take yet another 20 years and will likely also prove to be inadequate.

Thank you for your consideration.

Respectfully,

s/DreaTraeumer

Drea Traeumer, Hydrologist
drea.em@gmail.com

Please incorporate the following into the Executive Summary

Modify Table ES1 with the revisions presented below, which are based on the most current PSU information and include corrections and additions. If modifications will not be presented as suggested, please discuss why.

Revised Table ES1 with underlined corrections and additions for Apr - Oct averages and % NPS Reductions

Tributary and Season	Current Condition (lbs/day)	Load Allocation (lbs/day)	Allocation Concentration (mg/L)	Reduction[a] (%)	NPS Reduction[b] (%)
Hangman Creek					
Apr - May Avg	82.6	50.6	0.086	39	50.3
Jun - Oct Avg	4.3	3.3	0.0529	22	31.8
Apr - Oct Avg[c]	26.6	16.8	0.0624	37	48.4
Coulee Creek					
Apr - May Avg	14	8.5	0.086	40	50.6
Jun - Oct Avg	1.1	0.8	0.0529	20	29.6
Apr - Oct Avg	4.8	3	0.0624	36	47.8
Little Spokane River					
Apr - May Avg	131.5	114.6	0.0429	13	23.3
Jun - Oct Avg	58.2	55.8	0.027	4	47.8
Apr - Oct Avg	79.1	72.6		8	18

[a] % Reduction NPS needed to meet Load Allocation is not evident, as Current Condition used to calculate % Reduction is Natural + NPS

[b] % Reduction NPS needed to meet Load Allocation had been added to make evident

[c] Apr - Oct averages have been added to provide information for critical period (modified in TMDL from original Jun - Oct to Apr - Oct)

Please incorporate the following into the TMDL Analysis section

- Subsection "Additional Analyses Since 2004 Draft TMDL" (p. 15):

  Include more detail in this section about how Natural Background conditions were estimated for both the original and current Draft TMDLs (e.g. v.2004 and v.2007). Specifically, include discussion of how measured water quality data from outlet of Lake Coeur d'Alene were used in the original PSU model to estimate the "natural" condition of the river, and if/how these data were used in the current EPA model estimations.

- Subsection "Natural Background Conditions" (p. 16)

  "Natural" conditions at stateline were originally represented in the modeling for the Draft TMDL v. 2004 using measured water quality data from the outlet of Lake Coeur d'Alene, located upstream of the ID Dischargers. For this TMDL, the "natural" condition been modified to include the ID Dischargers at their permit limits. Please justify why Ecology elected to make this change given the availability of measured water quality data that were reasonable and appropriate for use in estimating the "natural" condition of the river as it crosses the stateline.

  Please discuss in more detail how the ID Discharger permit limits were determined. Specifically, discuss the EPA modeling methodology that was used to determine the ID permit limits, which relied on iterative simulations to determine the amount of loading that was found to cause the allowable 0.20 mg/L DO degradation in Long Lake. Perhaps clarify by way of comment that this iterative process is essentially the same method used by Ecology to determine Nonpoint Source Load Allocations for this TMDL.

- Subsection "Results of 2007 Analyses" (p. 17)

  Please provide more detail in this section for the % NPS Reductions that are needed. Specifically, include the range of % NPS Reductions needed (e.g. 8 – 37%); and explain that the 16% value reported in this section is the average value for Hangman, Coulee, and Little Spokane tributaries. Please also provide the ranges and averages for the remaining periods of analyses (e.g. Apr – May and Jun – Oct), which currently are only presented in Appendix C of the Draft TMDL.

  Please have both sets of Tables 2 - 4 in Appendix C corrected where average values are erroneously presented as totals.

Please incorporate the following into the Results and Discussion section

- Loading Capacity subsection (p. 20)

This section currently does not present the Loading Capacity in a clear fashion, as was done for the original TMDL v.2004. Please add the following table for ease of comparison and transparency, which has been updated using the most current information from PSU.

Lake Spokane Total Loading Capacity by Month

(Total Loading Capacity = 9Mi +LSR based on model estimates)

	avg TP	avg CBOD	avg NH3	TP lbs/day	CBOD lbs/day	NH3 lbs/day
APR	0.011	1.004	0.019	374	33266	645
MAY	0.008	0.828	0.026	629	61329	1892
JUN	0.009	0.752	0.027	237	19866	722
JUL	0.008	0.437	0.021	106	5440	260
AUG	0.010	0.408	0.018	79	3341	150
SEP	0.010	0.525	0.019	89	4593	163
OCT	0.012	0.774	0.022	156	10102	287
Apr-May avg	0.009	0.882	0.024	501.33	47297.21	1268.24
Jun-Oct avg	0.010	0.630	0.023	133.57	8668.61	316.60
Apr - Oct avg	0.009	0.783	0.023	238.64	19705.35	588.50

Allowable Nonpoint Source Pollution Loading (9Mi + LSR)

	TP lbs/day	CBOD lbs/day	NH3 lbs/day
APR	104	6579	-12
MAY	81	5462	11
JUN	45	2984	6
JUL	15	466	1
AUG	16	675	1
SEP	16	689	1
OCT	19	698	1
Apr-May avg	92.34	6020.74	-0.56
Jun-Oct avg	22.27	1102.51	1.66
Apr - Oct avg	42.29	2507.72	1.03

% Nonpoint source reduction needed to get from CURRENT to TMDL

	TP	CBOD	NH3
APR	39%	42%	18%
MAY	27%	42%	1%
JUN	42%	48%	-15%
JUL	60%	63%	6%
AUG	64%	64%	32%
SEP	67%	67%	40%
OCT	62%	57%	35%
Apr-May avg	32%	42%	6%
Jun-Oct avg	57%	56%	14%
Apr - Oct avg	45%	48%	9%

CURRENT 2001 CONDITIONS (based on model estimates)

	avg Flow	avg TP	(9Mi+LSR) avg CBOD	avg NH3	TP lbs/day	CBOD lbs/day	NH3 lbs/day
APR	6149.93	0.018	1.725	0.024	611	57187	788
MAY	13748.05	0.012	1.438	0.026	861	106549	1908
JUN	4900.14	0.016	1.437	0.024	412	37941	626
JUL	2308.90	0.021	1.180	0.022	265	14682	276
AUG	1519.29	0.027	1.137	0.027	218	9309	221
SEP	1622.94	0.031	1.597	0.031	267	13970	272
OCT	2421.54	0.031	1.815	0.034	408	23693	445
Apr-May avg	9948.99	0.015	1.582	0.025	735.70	81868	1348
Jun-Oct avg	2554.56	0.025	1.433	0.028	314.17	19919	368
Apr - Oct avg	4667.26	0.022	1.475	0.027	434.61	37619	648

"Natural" Conditions = NOSOURCE (9Mi + LSR)

	avg TP	avg CBOD	avg NH3	TP lbs/day	CBOD lbs/day	NH3 lbs/day
APR	0.008	0.805	0.020	270	26686	656
MAY	0.007	0.754	0.025	548	55867	1881
JUN	0.007	0.639	0.027	193	16883	716
JUL	0.007	0.400	0.021	91	4974	260
AUG	0.008	0.326	0.018	63	2666	150
SEP	0.008	0.446	0.019	73	3904	163
OCT	0.010	0.720	0.022	137	9404	287
Apr-May avg	0.008	0.78	0.023	409	41276	1269
Jun-Oct avg	0.008	0.51	0.021	111	7566	315
Apr - Oct avg	0.008	0.58	0.022	196	17198	587

Lake Spokane Total Loading Capacity by month with comparison to estimates of "Current" and "Natural" Condition loadings. Total Lake load was derived as the sum of "Natural" conditions and allowable nonpoint source (NPS) pollution loads for Spokane River near 9 Mile Dam (9Mi) combined with Little Spokane River near the mouth (LSR). Revised Nov. 2007 by Drea Traeumer.

- Subsection Load and Wasteload Allocations (p. 21)

  Modify Paragraph 1, sentence 2 in Wasteload Allocations subsections (p. 23) as underlined below to clearly show that overcontrol beyond the NPS Load Allocations is necessary to create assimilative capacity for Dischargers when effluent is greater than10 µg/L:

  > *"Therefore, without reducing the nonpoint source loads beyond their Load Allocations, no assimilative capacity is left for point source pollutant loading that would increase river concentrations of pollutants during the critical period (April 1 – October 31)."*

Modify Table 4 with the revisions presented below, which are based on the most current PSU information and include corrections and additions. If modifications will not be presented as suggested, please discuss why.

Revised Table 4 with underlined corrections and addition of Apr - Oct averages and % NPS Reductions

Tributary and Season	Current Condition (lbs/day)	Load Allocation (lbs/day)	Allocation Concentration (mg/L)	Reduction[a] (%)	NPS Reduction[b] (%)
Hangman Creek					
Apr - May Avg	82.6	50.6	0.086	39	50.3
Jun - Oct Avg	4.3	3.3	0.0529	22	31.8
Apr - Oct Avg[c]	26.6	16.8	0.0624	37	48.4
Coulee Creek					
Apr - May Avg	14	8.5	0.086	40	50.6
Jun - Oct Avg	1.1	0.8	0.0529	20	29.6
Apr - Oct Avg	4.8	3	0.0624	36	47.8
Little Spokane River					
Apr - May Avg	131.5	114.6	0.0429	13	23.3
Jun - Oct Avg	58.2	55.8	0.027	4	47.8
Apr - Oct Avg	79.1	72.6		8	18

[a] % Reduction NPS needed to meet Load Allocation is not evident, as Current Condition used to calculate % Reduction is Natural + NPS

[b] % Reduction NPS needed to meet Load Allocation had been added to make evident

[c] Apr - Oct averages have been added to provide information for critical period (modified in TMDL from original Jun - Oct to Apr - Oct)

Please incorporate the following into the Managed Implementation Plan section

The % NPS Reduction that must first be attained and then overcontrolled in order to create assimilative capacity for the Dischargers when effluent is greater than 10 µg/L is not explicit in this section. Please provide detail on the % Reduction that must be attained and overcontrolled, and where this reduction will be required. For example, is it the 16% presented in the TMDL Analysis subsection "Results of 2007 Analyses" (p. 17), which is an average value for the tributaries for Apr – Oct? Or is it the % NPS Reduction value specific to each tributary that must be attained and overcontrolled? It would seem that the % NPS Reductions should be based on individual tributary values, and not average values.

Explain how the additional 26.6 lbs/day phosphorus reduction (needed with Dischargers at 50 µg/L to meet the equivalent TMDL target of 10 µg/L in ten years) was determined, as stated in paragraph 3, p. 25 of the MIP section.

Reconcile the above statement with the simulation presented in Appendix C, PSU Tech Memo dated May 2007, which shows that with WA Dischargers at their interim limits of 50 µg/L and the tributaries set to "natural background" conditions (i.e. 100% NPS Reductions or zero NPS loading), the standard of 0.20 mg/L DO degradation is exceeded on several occasions.

Incorporate the following excerpt from The Foundational Concepts into the Reasonable Assurance subsection (p. 35):

> *"The MIP provides reasonable assurance that the Water Quality Standards can be achieved during the first ten years of the MIP effort…"*

Given the PSU simulation discussed above, the reasonable assurance presented in the Foundational Concepts and excerpted above does not appear to be supported. Please discuss and present evidence that will show with reasonable assurance that the water quality standard will be attained in the first ten years of the MIP. If is proposed that the Dischargers might possibly treat effluent to below the interim limit of 50 µg/L, please present simulations that will provide reasonable assurance by demonstrating the % NPS Reduction associated with possibly lower effluent concentrations that will meet the water quality standard (i.e. with treatment at 30µg/L, X % NPS Reduction will be needed to meet the water quality standard).

Incorporate into the Reasonable Assurances section examples and documentation of successful % NPS Reductions comparable to those needed for this TMDL, which are on average 34%, that have been attained elsewhere. These are needed to provide assurance that the % NPS Reductions that must be overcontrolled to create assimilative capacity for the Dischargers are, in fact, reasonable.

Spokane County's Septic Tank Elimination System is listed in the Reasonable Assurances subsection. Please determine an instream (as opposed to groundwater) Load Allocation for septic tanks, as this information is necessary to determine by what amount the Dischargers must overcontrol septic tank loadings to the river in order to create assimilative capacity when effluent is greater than 10 µg/L.

Please explain the cause and discuss the significance of the % changes between TMDLs v.2004 and v.2007 for the "natural" condition and % NPS Reductions that are presented in Appendix 1.

Attachment 1: Comparison of Results for Draft TMDLs v. 2004 and v. 2007

Apr - May	Current Condition (v. 2004)	Current Condition (v. 2007)	% Change Current	Natural Condition (v. 2004)	Natural Condition (v. 2007)	% Change Natural	% Reduction (v.2004)	% Reduction (v.2007)	% Change Reduction	% Reduction NPS (v.2004)	% Reduction NPS (v.2007)	% Change NPS Reduction
Stateline	386.1	360.8	-7	297.1	337.9	14	16.5	6.3	-62	71.5	99.9	40
Hangman Creek	56.7	82.6	46	12.2	19.0	55	75.6	38.7	-49	96.3	50.3	-48
Coulee Creek	14.8	14.0	-5	3.2	3.2	0	75.6	39.1	-48	96.4	50.6	-47
Little Spokane River	129.8	131.5	1	80.6	59.3	-26	31.7	12.8	-60	83.6	23.3	-72

Jun - Oct	Current Condition (v. 2004)	Current Condition (v. 2007)	% Change Current	Natural Condition (v. 2004)	Natural Condition (v. 2007)	% Change Natural	% Reduction (v.2004)	% Reduction (v.2007)	% Change Reduction	% Reduction NPS (v.2004)	% Reduction NPS (v.2007)	% Change NPS Reduction
Stateline	67.1	65.8	-2	48.0	59.4	24	21.8	9.8	-55	76.5	100.0	31
Hangman Creek	4.3	4.3	-2	1.3	1.3	-2	65.6	22.1	-66	94.0	31.8	-66
Coulee Creek	1.1	1.1	-7	0.3	0.3	0	65.5	20.0	-69	93.7	29.6	-68
Little Spokane River	57.9	58.2	0	38.9	36.0	-7	24.2	4.2	-83	73.6	11.1	-85

Apr - Oct	Current Condition (v. 2004)	Current Condition (v. 2007)	% Change Current	Natural Condition (v. 2004)	Natural Condition (v. 2007)	% Change Natural	% Reduction (v.2004)	% Reduction (v.2007)	% Change Reduction	% Reduction NPS (v.2004)	% Reduction NPS (v.2007)	% Change NPS Reduction
Stateline	158.2	150.1	-5	119.1	139.0	17	18.1	7.4	-59	73.2	100.0	37
Hangman Creek	19.3	26.6	38	4.4	6.4	44	73.9	36.8	-50	96.0	48.4	-50
Coulee Creek	5.0	4.8	-6	1.2	1.2	0	74.0	36.1	-51	96.1	47.8	-50
Little Spokane River	78.5	79.1	1	50.8	42.7	-16	27.8	8.3	-70	78.7	18.0	-77