CITY OF COEUR D'ALENE
WASTEWATER UTILITY DEPARTMENT

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February 26, 2010

Via U.S. Mail and E-mail: tstu461@ecy.wa.gov

Mr. Ted Sturdevant
Director
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504-7600

Re: Request for Dispute Resolution
Spokane River and Lake Spokane Dissolved Oxygen TMDL Water Quality Improvement Plan

Dear Mr. Sturdevant:

The City of Coeur d'Alene requests dispute resolution on the Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load Water Quality Improvement Report, Revised February 2010 (Pub. No. 07-10-073) ("TMDL") pursuant to Department of Ecology WQP 1-25.

1. Reason for Dispute Resolution Request

The City of Coeur d'Alene submits the follow matters for dispute resolution:

A. TMDL assumptions regarding treatment capacity.

While the TMDL does not directly make allocations to Idaho dischargers, Ecology has defined compliance with its water quality standards based on the water quality model used to derive load allocations for dischargers in Washington. EPA has indicated that it will issue NPDES permits in Idaho based on the same model assumptions used for the TMDL. The model assumptions, and thus the TMDL allocations, are based on what can be achieved with technology and what constitutes a fair allocation between dischargers and Avista as the operator of the Long Lake Dam. In this regard, Ecology divined that Coeur d'Alene can achieve a monthly maximum average of 50 µg/L for phosphorus concentration levels, adjusted by a conversion factor to a long term average of 36 µg/L.

Coeur d'Alene has been actively evaluating treatment technology to improve nutrient removal from its effluent since 2004 as part of the Spokane River Collaborative Process. Ecology was a participant in that process and is fully aware of the enormous effort to evaluate treatment technology, including pilot studies at the Coeur d'Alene

Wastewater Treatment Plant ("WWTP"). Based on those efforts and ongoing facility planning, Coeur d'Alene has not been able to identify any treatment technology that would allow it to achieve a seasonal average of 50 µg/L.

Coeur d'Alene has raised its concerns in this regard numerous times to EPA and to Ecology. Neither agency has identified any specific technology that is available to Coeur d'Alene that would enable Coeur d'Alene to achieve a seasonal TP average of 36 µg/L. The assumptions are simply arbitrary and capricious numbers selected by Ecology and EPA staff for water quality modeling.

Coeur d'Alene previously submitted its comment letter, dated September 27, 2007, to EPA Region 10, together with the attachment submitted with that letter. (Exhibit 1.) Ecology has not explained in response to these comments why this information does not justify revising the assumptions about treatment technology available to Coeur d'Alene in the TMDL water quality model. The capabilities of these technologies will not be confirmed without additional pilot testing, plant design, and optimization. But it is clear from the pilot testing described in Exhibit 1 that the technology will not be able to achieve 36 µg/L as a seasonal average. It is simply too soon for any qualified engineer to assert that 36 µg/L is an attainable seasonal average for Coeur d'Alene. It is not a good engineering practice, or defensible, for Ecology to prejudge the capabilities of treatment technology based on the analysis in Appendix J.

Ecology explained in response to these comments how it used Appendix J to determine the "very specific assumptions" that apply to the Idaho dischargers. The Appendix was not, however, discussed anywhere in the Draft TMDL and the Draft TMDL is silent as to what assumptions, if any, Ecology has derived from the report. Coeur d'Alene's prior comments incorporated by reference the HDR critique of Appendix J. (Exhibit 2.) Ecology's comment responses do not address the HDR critique in any respect other than to state that Ecology may consider treatment technology in developing a TMDL. That certainly is not at issue.

What is at issue is the selective and arbitrary use of data to justify the TMDL. It is, for example, meaningless for Ecology to declare that there is filter technology that can achieve 10 µg/L without some analysis or justification for application of that technology to Coeur d'Alene. The data from actual pilot testing together with the HDR critique demonstrate that such technology is not available to Coeur d'Alene.

The Draft TMDL includes a memorandum, Appendix L, from the Technology Work Group that was part of the Collaborative Process. That memorandum sets forth specific conclusions about the limitations of data and additional evaluation of data. Ecology did not respond to comments specifically asking whether it agrees or disagrees with the statements. It must therefore be assumed that Ecology agrees with the statements made in the memorandum. Agreement with these conclusions would render Ecology's determination that Coeur d'Alene can achieve a monthly maximum phosphorus average of 50 µg/L arbitrary and capricious and without substantial evidence in the record.

B. The selection of model Scenario #1 is arbitrary and capricious.

The TMDL and 2010 PSU modeling report fail to describe the difference in modeling results between Scenarios #1 and #2. This appears to be an intentional action by Ecology to obscure the evident fact that there is no meaningful difference between the results from either modeling scenario. From what can be gleaned from the documents, both scenarios show results that comply with the pH and dissolved oxygen water quality criteria at model segment 154. The results also show that both scenarios are compliant with the ad-hoc, and improper, use of EPA eco-region criteria. Ecology should fully disclose and discuss the differences in results for both scenarios.

The modeling results indicate that the differences between Scenario #1 and Scenario #2 are "slight." (Exhibit 3.) In response to these comments Ecology should explain both the full results for Scenario #2 and the basis for selecting Scenario #1 over Scenario #2.

The modeling results for Scenario #1 and Scenario #2 indicate that there are no real differences in the projected TP concentrations at model segment 154. (Exhibit 4.) Exhibit 4 indicates that Scenario #1 model results meet 10 µg/L 65% of the time from March through October. The modeling results also indicate, however, under Scenario #2, that the TP level at model segment 154 will meet 10 µg/L 62% of the time over the same period.

Ecology asserts that the "water quality goal at the benchmark location is being used to confirm that when the Spokane River enters the reservoir upstream sources of dissolved oxygen impairment have been reduced to the point where remaining dissolved oxygen impairments in the reservoir is caused by Long Lake Dam and is Avista's responsibility." Ecology has failed to explain the basis for this position, which lacks any legal, technical or equitable basis. It is not legally defensible, equitable, or reasonable to impose an allocation on Idaho dischargers that cannot be achieved where Avista is only assigned "responsibility" to "improve" dissolved oxygen conditions in Long Lake.

C. Idaho dischargers have minimal impact on dissolved oxygen levels in Washington.

The PSU modeling includes additional modeling for Idaho dischargers. The results from this modeling are not discussed anywhere in the TMDL. Ecology has not explained how the PSU modeling results were used to arrive at the "specific assumptions" about Idaho discharge permits.

Ecology should also acknowledge that the PSU modeling demonstrates that Idaho discharges do not cause or contribute to a violation of pH or dissolved oxygen criteria at the state line (PSU Report, Fig. 6) and at model segment 154 (PSU Report, Fig. 9). As shown in Figure 9, there is no difference between dissolved oxygen levels at model segment 154, comparing the No Source Scenario and Idaho only dischargers under Scenario #1.

The PSU modeling results for Idaho dischargers, PSU Report, Tables 14 and 15, show that the Idaho dischargers contribute only 5% of the DO incremental decrease in the lake from all sources based on the modeled results at depths of 179, 180 and 181 during the critical time of year (August 16-31).[1] More significantly, the results of the PSU Idaho only modeling shows that the Idaho sources cumulatively contribute to an INCREASE in DO at the critical depth of 188 for all modeled timeframes from June 1 to September 15, including the critical August 16 through 31 timeframe. The increases range from 0.13 in June to .01 in the critical August 16 through 31 timeframe. The PSU report does not explain the modeled DO increase contributed by the Idaho dischargers at the 188 critical depth.

Ecology should explain whether it believes that the results would be any different in comparing the No Source results with Idaho-only dischargers under Scenario #2. Ecology should also explain how it is reasonable and equitable to impose unachievable load allocations on Idaho when Idaho dischargers are not responsible for a measurable or modeled increase in dissolved oxygen at the riverine assessment point.

At Coeur d'Alene's request, LimnoTech conducted additional modeling runs assuming Idaho dischargers are responsible for higher seasonal average concentrations. (Exhibit 5.) The additional modeling assumed higher TP assumptions for Idaho-only discharges to assess the Idaho-only impact on the river and lake DO. At higher assumed TP allocations for Idaho sources, modeling conducted by LimnoTech demonstrates the Idaho sources set at allocation assumptions of 100 mg/l and 200 mg/l would add to the overall decrease in DO attributed to Idaho dischargers by only .011 and .045, less than 0.7% to 3% at the worst case depth (187 for Scenario #1 as modeled by PSU) and critical depth (188 for Idaho only scenarios of 100 and 200).[2]

Ecology ignored the PSU report which demonstrates that Idaho sources under Scenario #1 contribute to improved DO at the critical depth and demonstrates that the application of Scenario #1 allocations to Idaho is not equitable for Idaho. Ecology should not arbitrarily disregard its own modeling results. The PSU model reports show that Idaho sources at the critical river mile (154) and depth (188) and time of year under Scenario #1 allocation assumptions will both meet the DO criteria at the riverine assessment point and contribute to improved DO in the lake. There is no modeled impact on DO at the critical depth for Idaho sources. Idaho sources do not cumulatively or independently contribute to a decrease in DO at the critical depth under Scenario #1; they contribute to an increase or improvement in DO.

Ecology needs to reassess the assumed Scenario #1 allocations for Idaho sources based on the PSU modeling results and the LimnoTech modeling results. These results support higher allocation modeling assumptions for the Idaho sources by Ecology in its

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[1] David Dilks, LimnoTech, *Results of CE-QUAL-W2 Model Sensitivity Analyses in Response to Different Levels of Idaho Point Source Discharge*, at 3, September 1, 2009. (Exhibit 5.)

[2] *Id.* at 3.

selection of equitable WLA for Washington sources including Avista. The modeling results support an assumed range of TP allocations to the Idaho sources from 50 to 200 mg/l. The TMDL should be revised to include these ranges for Idaho sources as the assumed Idaho loadings for final modeling purposes. Based on the PSU 2009 modeling and LimnoTech modeling for Idaho-only sources, the stated TMDL WLA basis in Washington of equity among the sources and achievement of the DO standard at the riverine assessment point for upstream sources from both states can be achieved at these higher contribution assumptions. It will then be up to EPA to set permit limits for the Idaho dischargers based on this range.

During the development of the water quality modeling it was understood that Idaho dischargers would have a higher seasonal average than Washington dischargers, except Inland Empire Paper Company, which would have the same seasonal average as Idaho dischargers, and Kaiser Aluminum, which would have a lower seasonal average. (Exhibit 6.) Ecology should explain why this essential assumption was abandoned in the final modeling specifications.

D. The Idaho allocation improperly assumes that effluent offsets are available in Idaho.

In response to these comments Ecology should explain whether the use of effluent offsets was a factor in selecting Scenario #1 as the basis for the TMDL. Since the allocations of 36 µg/L are not achievable with known technology, the allocations must assume that allocations will only be achievable through technology and nonpoint source reduction.

During the TMDL development process it was made clear to EPA and Ecology that effluent offsets were not available to Idaho dischargers. (Exhibit 7.) Ecology should explain how effluent offsets are available to Coeur d'Alene and how offsets are factored into the "very specific assumptions" Ecology and EPA made about the Idaho discharger permits.

E. Ecology improperly rejected EPA's proposed allocation to Idaho dischargers.

In July 2009 EPA Region 10 submitted a proposed allocation for Idaho dischargers that was based on consultation with EPA headquarters and the EPA Office of General Counsel. (Exhibit 8.) The proposed allocation would have been based on the percentage of DO deficit in Lake Spokane attributable to Idaho dischargers and would have allowed EPA permitting in Idaho to set limits for the three municipalities in a manner that would address actual impacts relative to a water quality standard.

It was arbitrary and capricious for Ecology to reject base allocations on assumed capabilities of technology as opposed to any application of the state water quality criteria.

F. The use of eco-region criteria in the TMDL is arbitrary and capricious.

Ecology has relied on so-called eco-region criteria from EPA that have never been adopted by Ecology as part of the state water quality standards. Further, in response to comments Ecology specifically declined to adopt the EPA eco-region criteria as part of the state standards when the state standards were last updated.

Ecology additionally failed to acknowledge in response to comments that Ecology has not followed any of the procedures set forth in WAC 173-201A-230 for developing nutrient criteria. In particular, Ecology failed to acknowledge that it did not conduct a specific study or consider "stakeholder input as part of a public involvement process equivalent to the Administrative Procedure Act" as required under WAC 173-201A-230(3)(b). The use of the eco-region criteria in the TMDL exceeds the authority of the department, violates the Clean Water Act procedures including public notice requirements for adopting water quality standards, and violates Washington's Administrative Procedure Act.

Ecology also failed to acknowledge in response to comments that it derived the eco-region criteria for the TMDL simply by determining the boundary between two eco-regions. The Idaho Department of Environmental Quality ("DEQ") was highly critical of the arbitrary and capricious manner in which the EPA criteria are being applied in the TMDL. (Exhibit 9.) Ecology's reply is not responsive to DEQ's comments in Exhibit 9. As such, the use and application of the eco-region criteria is arbitrary and capricious and is not based on substantial evidence in the record.

G. Lake Spokane is not an oligiotrophic water body.

Ecology failed to acknowledge in response to comments that the Spokane River and Lake Spokane are not oligiotrophic water bodies. Lake Spokane, as a man-made reservoir, has probably always been a mesotrophic water body, as it supports a warm-water fishery. There is no evidence of salmonid spawning.

Ecology has previously found that Lake Spokane is and was of a mesotrophic state. The following is excerpted from Ecology's nutrient criteria development guidance document:

> **"Oligiotrophic" Conditions**
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> Low algal productivity will generally exist with TP in the range of 0 to 10 µg/L (Nordin, 1985; Funk and Moore, 1985; Gilliom 1984; OECD, 1982; Simpson and Reckhow, 1979). Carlson (1977) states that at TP ranges from 0 to 12 µg/L, mean chlorophyll-a will be less than 3 µg/L and Secchi transparency depths will be greater than 5 meters. Water-uses are supported for recreation, drinking water, and aquatic life. The water is generally of high clarity and

> is aesthetically pleasing. According to Nordin (1985) and Ney, et al (1990), fisheries productivity will be quite low at TP concentrations less than 5 µg/L.
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> **"Mesotrophic" Conditions**
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> Moderate algal productivity will generally exist with TP in the range of 10 to 20 µg/L (OECD 1982; and others) or 12 to 24 µg/L (Carlson,1977), chlorophyll-a in the range of 2 to 6 µg/L, and Secchi transparency depths between 3 and 5 meters (Gilliom, 1984). Cold-water fisheries may be adversely affected by some degree of hypolimnetic oxygen depletion. There may be additional benefits to salmonids in lakes from having TP less than 15 µg/L (Nordin, 1985).[3]

The guidance document – Table 2.2 – refers to Lake Spokane as mesotrophic as described by Patmont in 1987.[4]

Ecology has also acknowledged the mesotrophic conditions in Lake Spokane in other studies:

> Even though the URS (1981) report highlighted the need for public input as "essential" for selecting an appropriate water quality criterion for protecting beneficial uses, there does not appear to have been much public involvement or intergovernmental coordination (e.g., Fish and Wildlife) in determining the beneficial uses of Lake Spokane, or in determining the lake criterion (time- and area-weighted average euphotic zone TP concentration of 25 ug/L).
>
> Initially, Ecology recommended managing Lake Spokane as an upper mesotrophic system by identifying a mean euphotic zone chlorophyll *a* criterion for the June-October period of 10 ug/L (a value that represents the threshold between mesotrophic and eutrophic conditions). This criterion did not lead directly to the site-specific TP criterion that was ultimately approved by EPA. The TP criterion was adopted because predicted phytoplankton biovolume and Secchi disc fell within an approximate mesotrophic criteria range. However, it was acknowledged

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[3] Moore, A., Hicks, M., *Nutrient Criteria Development In Washington State Phosphorus*, Washington State Department of Ecology, Water Quality Program, Watershed Management Section, April 2004. Publication Number 04-10-033.

[4] Patmont, C.R., et al, *The Spokane River Basin: Allowable Phosphorus Loading*, Harper-Owes, Seattle, WA. 1987.

> that the predicted trophic characteristics for mean and peak chlorophyll *a* and mean hypolimnetic minimum dissolved oxygen may exceed the upper mesotrophic target boundary values (i.e., eutrophic characteristics). Data collected since 1978 show that the chlorophyll *a* variables regularly exceed the mesotrophic target boundary values of 10 ug/L in the upper end of the lake....

In 2004 Ecology found that "before establishing any modified phosphorus TMDL for the lake, the **beneficial uses and an appropriate criterion to protect the uses, including the time period(s) to protect, need to be determined."**[5] (Emphasis added.) The TMDL does not include any analysis of beneficial uses in Lake Spokane and throughout this process Ecology has been unwilling to consider the actual beneficial uses in the lake. Absent that information, it is arbitrary and capricious to impose the EPA eco-region criteria as part of the TMDL analysis.

H. The TMDL is based on inequitable translator factors from assumed monthly maximum averages to long term averages in the TMDL model.

The TMDL model uses a higher translator value in the water quality model for the City of Spokane and Spokane County on the basis that the City of Spokane currently, and Spokane County in the future, will monitor effluent discharges more frequently than Coeur d'Alene. As a result, Coeur d'Alene has a proportional smaller allocation than the Washington dischargers. More recently, Ecology's Eastern Regional Office has recognized the blatant inequity in these model assumptions and has declared that any Washington discharger can obtain a higher waste load allocation if their permit requires more frequent monitoring. In contrast, EPA has informed Coeur d'Alene that it cannot make a similar accommodation in its NPDES permit. This inequity can only be addressed through revision of the TMDL.

I. Other Dispute Issues.

Coeur d'Alene joins the request for dispute resolution filed on behalf of the City of Post Falls and the Hayden Area Regional Sewer Board and incorporates their request herein.

2. Prior Communications on Issues.

As set forth above and in the attached documents, the foregoing concerns have been raised repeatedly to Ecology in formal and informal comments.

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[5] Cusimano, B., *Spokane River and Lake Spokane (Long Lake) Pollutant Loading Assessment for Protecting Dissolved Oxygen*, Washington State Department of Ecology, February 2004. Publication No. 04-03-006.

3. Citations of Applicable Authority.

The Department of Ecology is required to respond to all comments submitted on the draft TMDL. Pursuant to 40 CFR section 130.7(c)(ii) and the 1997 Memorandum of Agreement between the Department of Ecology and EPA, Ecology must ensure that the TMDL submittals to EPA include a responsiveness summary to public comments as described in 40 CFR section 25.8. Under 40 CFR section 25.8 the response to comments must include "the agency's specific responses in terms of modifications of the proposed action or an explanation for rejection of proposals made by the public." Ecology failed to comply with these requirements by essentially ignoring the comments and data presented by Coeur d'Alene in its comments.

The Department of Ecology must also respond to comments and resolve the above technical issue in order to survive the inevitable challenge to any EPA approval of the TMDL under the federal Administrative Procedures Act. The failure of Ecology to act on a neutral and rational basis is grounds for a federal court to reject any EPA approval of the TMDL. *FCC v. Fox Television Stations, Inc.*, __ U.S. __, 129 S. Ct. 1800, 1823 (2009). An agency action is arbitrary and capricious if it fails to consider an important aspect of the problem or offers an explanation for its decision that runs counter to the evidence before the agency. *Friends of Richards-Gebauer Airport v. FAA*, 251 F.3d 1178, 1185 (8th Cir. 2001).

4. Copies of Correspondence.

Coeur d'Alene is submitting with this letter its comment letter on the draft TMDL together with each and every document referenced therein.

5. Relief Requested.

Coeur d'Alene respectfully requests that the TMDL be withdrawn and that Ecology undertake a revised water quality model that makes reasonable assumptions about the treatment technology available to Coeur d'Alene and other Idaho dischargers and equitably accounts for reasonable opportunities available to Coeur d'Alene to achieve its waste load allocation under the TMDL.

6. Request for Oral Presentation.

Coeur d'Alene requests an opportunity to present its case for dispute resolution in person before the dispute resolution panel as provided in WQP 1-25. Coeur d'Alene reserves the right to be represented at the oral presentation by employees of the city, its consultants, and attorneys. Coeur d'Alene assumes that the dispute resolution panel will be neutral and will not be briefed or otherwise confer with Ecology staff or any other party regarding the matters subject to this request for dispute resolution other than through written submissions that are copied to Coeur d'Alene and oral presentations to the panel in an open proceeding. Please advise me immediately if the panel intends to

confer with Ecology staff independently on matters that are subject to the foregoing dispute resolution.

I appreciate your consideration of the foregoing request for dispute resolution.

Sincerely

H. Sid Fredrickson
Wastewater Superintendent

Enclosures
cc: John Tindall, P.E., IDEQ (John.Tindall@deq.idaho.gov)
Kelly Susewind, WDOE (ksus461@ecy.wa.gov)
Jim Bellatty, WDOE (jbel461@ecy.wa.gov)

City of Coeur d'Alene
Exhibits to Comment Letter on 2009 Draft TMDL for DO
in the Spokane River and Lake Spokane

Exhibit 1	Letter from Sid Fredrickson to Brian Nickel dated September 27, 2007, with attachments.
Exhibit 2	Dave Clark, HDR, review of March 24, 2009, EPA Region 10 Memorandum on Wastewater Treatment Plants Achieving Low Effluent Phosphorus Concentrations.
Exhibit 3	Email from David Knight to Laurie Mann (June 23, 2009).
Exhibit 4	Email from Brian Nickel to Dave Moore (July 2, 2009) with attachment.
Exhibit 5	David Dilks, LimnoTech, Results of CE-QUAL-W2 Model Sensitivity Analyses in Response to Different Levels of Idaho Point Source Discharge, September 1, 2009.
Exhibit 6	Setting Phosphorus Targets in the Spokane TMDL to Meet Dissolved Oxygen Criteria (April 1, 2009).
Exhibit 7	Email from Marti Bridges to Robert Steed, August 14, 2009.
Exhibit 8	Email from Laurie Mann to Dave Moore (July 29, 2009); Email from Susan Braley to David Moore (July 31, 2009); Attachment "Loading from Sources in Idaho."
Exhibit 9	Email exchange between Robert Steed and John Tindall, dated April 13, 2009.

Exhibit 1

CITY OF COEUR D'ALENE

WASTEWATER UTILITY DEPARTMENT

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September 27, 2007

VIA EMAIL AND HAND DELIVERY

Mr. Brian Nickel
Office of Water and Watersheds
United States Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-130
Seattle, WA 98101 83814

Re: Comments on Draft Permit for City of Coeur d'Alene
NPDES Permit No. ID-002285-3

Dear Mr. Nickel:

The City of Coeur d'Alene previously requested an opportunity to respond to separate comments by the Center for Justice and Public Employees for Environmental Responsibility on the City of Coeur d'Alene draft NPDES Permit No. ID-002285-3 that was issued for public comment on February 16, 2007. The City renews its request and asks that EPA consider the following response to the comments on the draft permit.

This response to comments is limited to two issues in the draft permit: the basis for the phosphorus, CBOD and ammonia numeric effluent limitations and the proposed compliance schedule to achieve compliance with these limits. The limited scope of this response to comments is not intended be an agreement on or lack of objection to other comments, but only to highlight two very significant areas of concern to the City.

In general, neither environmental group fully understands the magnitude of the undertaking that will be required under the draft permit. The City of Coeur d'Alene will be accountable to achieve permit limits that are among the most stringent nationally using technology that has never been applied at the scale of the City's wastewater treatment plant. If EPA is intent upon issuing the City a permit with interim and final numeric effluent limits, the final permit must include a reasonable period of time for the City to achieve compliance with the new limits.

Coeur d'Alene objects to the manner in which the two environmental groups assert effluent limitations should be derived. As a matter of law, Coeur d'Alene is obligated to not cause or contribute to a violation of Washington water quality criteria at the state line. Under the current Washington water quality criteria, the applicable standard for dissolved oxygen in Long Lake is to ensure that human activities considered cumulatively do not cause the dissolved oxygen in the lake to decrease more than 0.2 mg/L below natural conditions. WAC 173-210A-200 Table 200(1)(d)(i). The relevant human activities for the purpose of Coeur d'Alene permit are the combined impact of the Idaho dischargers.

The application of Washington dissolved oxygen water quality criteria, approved as part of the anitdegradation rule by EPA in 2007, was previously used in the development of the Spokane River TMDL based on the assumption that discharges within the 0.2 mg/L limit would have no measurable impact on water quality. See EPA, *Loading Assessment for the Spokane River and Lake Spokane*, at 61-61 (2004). The CE-QUAL model used for developing the TMDL and the draft permit for Coeur d'Alene is also based on very conservative assumptions that will not apply in most years on the Spokane River. Moreover, the Idaho dischargers collectively comprise a small percentage of the pollutant loading to the Spokane River in Washington. The draft permit fact sheet recognizes that that the discharges from the Cities of Coeur d'Alene and Post Falls represented approximately 5% of the total anthropogenic phosphorus loading to Lake Spokane in 2003. (The Hayden Area Regional Sewer Board wastewater treatment plant (WWTP) was not included in this calculation because it did not discharge to the Spokane River during the summer of 2003.) Non-point source contributions of the three pollutants of concern are insignificant in the Idaho reach of the Spokane River. Combining all of these factors, the conservative water quality criteria, the assumptions in the model and relatively minor contribution of Idaho dischargers, the resulting numeric effluent limitations are not, when implemented, likely to cause or contribute to a violation of water quality standards.

The proposed phosphorus limits for Coeur d'Alene are, if anything, too conservative. The assumptions made in deriving the proposed limits are well within the legal standard that upstream dischargers not cause a detectable change in the water quality in the downstream state. This is the legal standard that applies to Idaho dischargers under *Arkansas v. Oklahoma*, 503 U.S. 91 (1992).

It would be improper for EPA to consider downstream sources and allocate waste loads to Coeur d'Alene. The environmental groups misconstrue 40 CFR § 122.44(d)(ii) as requiring EPA to account for all sources of pollution on the river as part of an individual permit decision. If EPA is going to engage in load allocation as demanded by the environmental groups, it should be on the same terms as the Spokane River TMDL. The revised draft TMDL issued on September 12, 2007, implements a twenty year strategy where dischargers will seek substantial reductions in phosphorus loading through nonpoint source protection and through implementation of new treatment technologies. Ex. 1, Draft Spokane River and Lake Spokane Dissolved Oxygen TMDL, 70-71. The TMDL provides for continuing review and readjustment of the goals during the twenty year period.

On September 5, 2007, the State of Washington also issued draft NPDES permits to the current Washington dischargers: City of Spokane NPDES Permit No. WA-002447-3; Liberty Lake Water and Sewer District NPDES Permit No. WA-0045144; Kaiser, Aluminum NPDES No. WA-0000892; and Inland Empire Paper Company NPDES No. 000082-5. See Ex. 2. These permits are structurally similar to the Coeur d'Alene draft permit in that each discharger must select and implement new treatment technology and nonpoint source control programs. The Idaho permits are substantially more stringent, however, by imposing interim and final numeric

effluent limitations for phosphorus, CBOD5 and ammonia to meet Washington waste load allocations (WLAs) for dissolved oxygen.

The Washington permits, in contrast, contain no interim or final numeric limits to meet phosphorus, CBOD5 and ammonia water quality criteria or TMDL WLAs for dissolved oxygen. The rationale for this approach is provided in the Fact Sheet for the City of Spokane draft permit:

> Based on the TMDL technical reports, the stoichiometric relationship of phosphorus, ammonia and CBOD embedded in the computer models and verified by calibration exercises, the Foundational Concepts assumes that efforts to control phosphorus will also serve to control CBOD and ammonia (i.e. phosphorus treatment technology will result in effluent ultimate CBOD and ammonia concentrations below applicable WLAs). This assumption will be continually evaluated as data is collected during the first ten years of the MIP. The 10th year assessment will determine the necessity, if any, for further reductions in phosphorous, CBOD and ammonia in order to achieve the water quality standards for dissolved oxygen. As such, the proposed permit does not contain either final effluent limits based on WLAs or compliance schedules for CBOD and ammonia. If necessary, compliance with the ultimate CBOD and ammonia WLAs will be addressed in the second ten years of the MIP. The Department expects that all principles of the MIP directed toward phosphorus removal will also result in CBOD and ammonia control and reduction. These would include elements such as WLA targets expressed as pounds per day, delta elimination, pollutant trading, etc.
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> For total phosphorus, the 2017 and 2027 target WLA is 3.49 lbs/day (10µg/L at 41.76 mgd) in 2017 and 4.24 lbs/day (50.77 mgd) in 2027. For the first five year permit cycle, the Foundational Concept document requires the permit be issued with total phosphorus effluent limits adjusted based on performance history. For the proposed permit, enforceable terms will also include the obligation to start, continue, and/or complete certain target pursuit actions as described in the section "Implementation of Foundational Concepts" found below.
>
> Additionally, the permits will specify that a goal of achieving an equivalent of an effluent phosphorus concentration of 10 µg/l phosphorus by the end of the following (second) permit cycle (i.e., in 10 years).

Ex. 3, Draft Fact Sheet NPDES Permit WA 002447-3 City of Spokane's Riverside Park Water Reclamation Facility (the POTW), 19-20.

If EPA intends to subject Idaho dischargers to the same load allocations as the Washington TMDL, the permit limits for Coeur d'Alene should be based on the same assumptions as the conditions for the current Washington dischargers. In that case, Coeur d'Alene should be

regulated in the same manner as the Washington dischargers. The permit should not include numeric limits to address dissolved oxygen but instead rely on the TMDL approach of implementing adaptive management.

Finally, Coeur d'Alene has a well considered basis for requesting a compliance schedule of at least nine years to achieve final effluent limitations in the draft permit as approved by the State of Idaho Department of Environmental Quality in the section 401 certification. The environmental groups argue that technology is readily available to achieve a phosphorus limit of 0.01 mg/l. This absurd contention is based principally on a report recently published by EPA Region 10, D. Ragsdale, *Advanced Wastewater Treatment to Achieve Low Concentrations of Phosphorus* (EPA Region 10, April 2007)

Coeur d'Alene objects to the timing of the release of this report during the comment period on its draft permit. It is not clear why Region 10 chose to issue this report and how the report relates, if at all, to the Idaho permit conditions. The principal author of the report, Dave Ragsdale, has made clear that he is adverse to EPA and the draft permit. *See* Ex.4, J. Hegengruber, *Spokesman Review*, "Scientist Departure Taints River Cleanup Plan" (Sept. 10, 2007). The bias of the report is amplified by the participation in the development of the document by Ken Merrill from the Department of Ecology. Mr. Merrill, whose extensive self-serving emails have been submitted as part of the comments by the environmental groups, acknowledges in the recent news article that he is no longer invited to participate in the Spokane River TMDL process. *Id.* This conflict of interest is no less than the participation of Bonnie Beavers, legal counsel with the Center for Justice, who is also counsel for the Sierra Club and author of the comment letter on behalf that organization. Coeur d'Alene also objects to the failure of EPA to provide any opportunity for the City to review and comment on the report before it was published. This fact is troubling given the participation of Ken Merrill and Bonnie Beavers in drafting the report and the extensive reliance of Ms. Beavers on the report in her comments on behalf of the Sierra Club.

The report itself is not accurate in its evaluation of treatment plants. The report states, for example, that "[t]he total phosphorus concentrations achieved by some of these WWTPs are consistently near or below 0.01 mg/l." In reality, of the 23 plants included in the report, only Breckenridge, Colorado, Stamford, New York, and Walton, New York actually report average phosphorus less than 0.01 mg/l. These are relatively small plants with rated capacities of 3 mgd, 0.5 mgd and 1.55 mgd, respectively. In contrast to these plants, the much larger 6.0 mgd capacity Coeur d'Alene plant has anaerobic digestion facilities for solids stabilization, which impacts liquid stream performance. It is not technically sound to compare the results from three small plants with larger facilities and unique conditions on the Spokane River.

EPA should acknowledge the process to evaluate treatment technologies that was an important part of the collaborative effort to develop the Washington TMDL for the Spokane River. As part of that process there was a specific workshop held on August 16, 2006, to evaluate treatment technology. That discussion included the applicability of treatment technologies used at other locations and the sensitivity to local wastewater characteristics and water chemistry conditions.

This in turn led to local pilot treatment studies at Inland Empire Paper, the City of Spokane and the City of Coeur d'Alene. Many of the advanced treatment technologies included in the Ragsdale report were tested in these local studies including:

- Zenon Membrane Filtration
- US Filter Trident
- Blue Water Technology Dual Sand Filtration
- Parkson Dual Sand Filtration

The following table presents a summary of the total phosphorus results from the pilot testing in Coeur d'Alene.

Summary of City of Coeur d'Alene Phosphorus Pilot Testing[1]

Technology	Final Effluent Total Phosphorus – All Data Reported (µg/l)[2]	Final Effluent Total Phosphorus – Excluding Data Excursion Due to Equipment (µg/L)[3]
Zenon ZW-500 Membrane Filtration	67.4	24.1
US Filter Trident THS-1	19.2	19.2
Blue Water Technology BluePro Dual Sand Filtration	21.4	21.4
Parkson D2 Dual Sand Filtration	84.1	39.6

[1] Preliminary Coeur d'Alene pilot study results were presented by Mario Benisch, HDR Engineering, at the August 16, 2006 Treatment Process Workshop.
[2] Effluent phosphorus performance data (all data) from Table 3 of the City of Coeur d'Alene "Tertiary Phosphorus Removal Technology Pilot Study," Final Draft Report, May 2007.
[3] Effluent phosphorus performance data (excluding equipment caused excursions) from Table 4 of the City of Coeur d'Alene "Tertiary Phosphorus Removal technology Pilot Study," Final Draft Report. May 2007.

Contrary to the conclusions in the Ragsdale report, none of the treatment technologies included in pilot testing produced effluent total phosphorus of 0.01 mg/l or less. Further, the variability of pilot testing results exhibit the sensitivity to local applications, wastewater characteristics, water quality conditions, and site specific operations when pursuing extremely low effluent phosphorus. For example, the Parkson Dynasand D2 Pilot Test Report, February 5, 2007, notes

that the "data collected during this pilot study points to the fact that there was too much soluble non-reactive phosphorus in the waste stream to consistently achieve an effluent Total Phosphorus of less than 0.01 mg/l." *See* Ex. 5.

It is important to note that pilot testing is highly controlled and represents the best possible conditions under which treatment technologies might perform. Full-scale operations would not be expected to perform as well as pilot testing since full-scale plants cannot be operated under such tightly controlled conditions and must accept the recycle loadings from solids processing facilities.

It would be inappropriate for EPA to rely on the conclusions in the Ragsdale report to shorten the compliance schedule. The conclusions presented in the report as so-called "observations" are not science and they do not reflect a qualified engineering opinion. Actual experience on the ground, with the Coeur d'Alene plant and two other treatment plants on the Spokane River in just the past year demonstrate conclusively that the conclusions in the Ragsdale report are without merit. The conclusions by Mr. Ragsdale in the report are also undercut by the Sierra Club's own expert, Carpenter Environmental. Far from stating that the technology is immediately available, the memorandum from Carpenter Environmental submitted with Sierra Club's comments states that it would require four and a half to seven years to complete planning, design and implementation of advanced treatment at Coeur d'Alene.

Coeur d'Alene is committed to improving water quality in the Spokane River. That commitment is reflected in our funding and participation in the collaborative process. It is also reflected in the on-going facility planning by the City. We have asked, based on our experience with our facility, pilot testing in the Spokane River and in consultation with licensed professional engineers who actually design and implement treatment technology, for nine years to achieve compliance with the final limits in the draft permit and our proposed alternative limits for ammonia and CBOD5 as submitted with our earlier comments. This request is reasonable and should be granted.

I appreciate your consideration of these comments and the attached list of additional materials referenced in this letter.

Sincerely,

H. Sid Fredrickson
Wastewater Superintendent

Cc: John Tindall, P.E., IDEQ
Roger Tinkey, P.E. IDEQ

Exhibits Referenced in Coeur d'Alene Response to Comments

1. Draft Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load – Water Quality Improvement Report, Department of Ecology (September 2007)
2. Draft Spokane River NPDES permit issued in September 5, 2007:
    a. City of Spokane NPDES Permit No. WA-002447-3
    b. Liberty Lake Water and Sewer District NPDES Permit No. WA-0045144
    c. Kaiser Aluminum NPDES Permit No. WA-000089-2
    d. Inland Empire Paper Company NPDES Permit No. WA-000082-5
3. Fact Sheet for NPDES Permit WA 002447-3 City of Spokane - Riverside Park Water Reclamation Facility (POTW) and Spokane County (Pretreatment Program), 19-20
4. J. Hegengruber, *Spokesman Review*, "Scientist Departure Taints River Cleanup Plan" (Sept. 10, 2007)
5. D. Janssen, Dynasand D2® Advanced Filtration System Pilot Test Final Report, Parkson Corporation (February 5, 2007).

SPOKESMANREVIEW.COM Tuesday, September 11, 2007

Scientist's departure taints river cleanup plan

Long in the works, state to unveil proposal on Wednesday

James Hagengruber
Staff writer
September 9, 2007

A multihundred-million-dollar plan aimed at cleaning up the Spokane River and returning life to vast dead zones deep in Long Lake will be unveiled Wednesday.

But the Washington Department of Ecology scientist who spent the last year writing the plan abruptly quit at the end of August, claiming the proposal is scientifically indefensible and will violate state water quality laws.

"I have never authored anything that's not defensible," Drea Traeumer said in a recent interview. "My recommendations on how to proceed defensibly were disregarded."

With her resignation, Traeumer becomes at least the third government scientist involved with river cleanup strategy in recent years to have jumped ship over concerns that the plan is too weak.

News of Traeumer's departure has prompted jitters for city and business officials as they prepare to spend huge amounts of money to meet the plan's requirements. The city of Spokane alone expects to spend nearly a half-billion dollars to more thoroughly purify wastewater dumped into the river.

For environmentalists, Traeumer's exit has become powerful ammunition in an increasingly heated battle for a tougher river cleanup plan. "This is not going to hold up – when the staff itself is raising these red flags," said Rick Eichstaedt, an attorney for the Center For Justice, a Spokane public interest law firm representing the Sierra Club.

Nine years in the making

Fed by rain and snowmelt from the Idaho Panhandle, the Spokane River flows west out of Lake Coeur d'Alene, through Post Falls and downtown Spokane, and eventually into the Columbia River. Each day, about 75 million gallons of treated wastewater – mostly from municipal sewage treatment plants, but also from Kaiser Aluminum and Inland Empire Paper Co. – is dumped into the river. Inland Empire Paper is owned by the same company that owns The Spokesman-Review.

Although the sewage and industrial effluent is treated, it contains a variety of pollutants, including about 200 pounds a day of phosphorus, according to reports from Ecology. Phosphorus acts as a fertilizer for aquatic plants, which has resulted in massive algae blooms – including toxic forms of blue-green algae – downstream in Long Lake, the Spokane River reservoir also known as Lake Spokane. When the algae dies, it sinks and decomposes, sucking oxygen out of the water that's needed by fish and insects for breathing.

To meet federal law and downstream water quality standards of the Spokane Tribe of Indians, the state has spent nine years coming up with a plan to reduce the amount of phosphorus in the river.

A 2004 cleanup proposal from the Department of Ecology would have brought the river into compliance with federal law and was widely supported by environmental groups, but the plan was criticized by cities and factories along the river as being too expensive and likely unreachable. Ecology then began working with polluters – as well as the environmental groups – to come up with an acceptable plan.

The Washington Department of Ecology is capping three acres of land at the Murray Road site on the Spokane River with one foot of material because of high levels of lead, arsenic, cadmium and zinc.The Spokesman-Review (Holly Pickett The Spokesman-Review)

At a glance

What's next

Public meeting: The proposed water quality improvement plan for the Spokane River will be explained at a meeting hosted by the Washington Department of Ecology.

When: Wednesday at 6:30 p.m.

Where: Spokane Falls Community College, Student Union Building, 3410 W. Fort George Wright Dr.

Workshop: The Sierra Club will help people understand and comment on the river cleanup plan.

When: Sept. 24 at 6:30 p.m.

Where: Community Building, 35 W. Main St. in Spokane.

Polluting decision

Among the changes was a decision by state and federal agencies to consider water flowing across the Washington-Idaho border as being essentially free of human-caused contaminants, even though the water contains phosphorus from wastewater treatment plants in Coeur d'Alene and Post Falls, said Rachael Paschal Osborn, an environmental activist and Spokane public interest attorney who has been closely involved in the process. The change allowed more pollution to be dumped in Washington.

"Basically, you fiddle with the parameters until you get the answers you want," Osborn said.

Numerous scientists at Ecology and the U.S. Environmental Protection Agency – the federal agency that must approve any state cleanup plan – raised red flags over the proposed changes, saying they would result in a lesser cleanup and were possibly illegal.

EPA engineer Dave Ragsdale, who had been involved in the cleanup plan since 1999, said he told supervisors of his concerns, particularly the cumulative impact of pollution from Idaho. Ragsdale also published a study that refuted the cost concerns expressed by cities and businesses along the river.

Ragsdale, a 30-year veteran of the EPA, is no longer working on the Spokane River cleanup plan. He declined to say why.

"They came up with a new process and I'm not supposed to talk about it," Ragsdale said, adding only, "I have a difference of opinion than the official agency perspective."

Before Traeumer worked as Ecology's lead cleanup plan scientist, the job was held by Ken Merrill, who continues to work for the agency but is no longer involved with the Spokane River. Merrill declined to provide details of his job transfer – "I can't go into it," he said – saying only that he was not formally taken off the job, but that he was no longer invited to participate in the process. "They didn't like the way I was doing it," he explained.

When pressed to elaborate, Merrill said, "I was trying to make it legally, scientifically and technically defensible. Management decided to go a different route from the route we developed."

Traeumer also declined to comment, beyond issuing a statement in which she said the proposed cleanup plan would not be defensible either in court or in scientific journals. Traeumer said she sought the advice of outside scientists before tendering her resignation.

Ecology spokeswoman Jani Gilbert said Traeumer's departure has put the agency in a difficult position.

"You never like somebody to leave nine-tenths of the way through a project," Gilbert said.

But Gilbert denied accusations the plan was flawed.

"It's an excellent water quality improvement plan. We arrived at it with the help of the community in the collaborative process," Gilbert said. "It's not only a good plan, but it's a very legal plan."

As for the issue of polluted water flowing over the state line, Gilbert said that under proposed changes, Idaho contributes roughly 5 percent of the human-caused phosphorus going into the river. "It's almost negligible," she said.

Attorneys with the Center For Justice see it differently. The proposed plan might offer vast improvements for the river, but it doesn't go far enough and doesn't include any enforceable standards for the first 20 years, Eichstaedt said.

"In their zeal to come out with a plan, they don't even care about how legal the plan is," he said. "Close doesn't count. It's not horseshoes or hand grenades."

Center For Justice attorney Bonne Beavers reviewed a draft copy of the plan Friday and was "astonished" by its lack of standards, as well as a provision she said would allow the city of Liberty Lake to discharge additional phosphorus-tainted wastewater into the river.

"My jaw's on the floor," Beavers said. "You can't make it worse while you're trying to make it better. These permits allow them to make it worse. It's crazy."

Both Beavers and Eichstaedt said the proposed plan is not acceptable and would likely be appealed. Concerns expressed by agency scientists could help potential legal challenges, Eichstaedt said. "All of this will be part of the record if and when a judge reviews this. It will be fairly obvious that this approach is simply flawed."

Anxiety for communities

The prospect of lawsuits is prompting some anxiety for communities and factories along the river preparing to invest hundreds of millions of dollars in wastewater purification technology.

"The city has some concerns about how all this plays out in the end," said Lloyd Brewer, environmental program manager for the city of Spokane, which expects to spend at least $400 million on wastewater treatment plant improvements.

"I'm a little uneasy," said Spokane County Commissioner Todd Mielke. The county expects to spend between $100 million and $150 million on a new wastewater treatment plant. Mielke also praised Ecology for attempting to develop a cleanup plan with achievable standards.

Within a decade, the proposed cleanup plan will result in a 95 percent reduction in the amount of phosphorus dumped into the river, said Gilbert, with the Department of Ecology. "If the Center For Justice wants to appeal (the plan), it will just delay improving the river," Gilbert said. "It will put everything on hold."

Eichstaedt, with the Center For Justice, said it's not just environmentalists who are uneasy with the cleanup being offered for the Spokane River. He said the state should have spent more time listening to its own experts.

"Someone shouldn't have to quit and shouldn't have to come out to the press in order for a proper cleanup to occur," he said. "It's embarrassing our Department of Ecology is continuing to ignore her concerns and the concerns of others."

Exhibit 2

Review of March 24, 2009 EPA Region 10 Memorandum on Wastewater Treatment Plants Achieving Low Effluent Phosphorus Concentrations

EPA has distributed a March 24, 2009 Memorandum from Brian Nickel of Region 10 to David Moore of Washington Ecology containing an analysis of low effluent phosphorus treatment facilities:

> ***"Subject: Summary of previous reports and discharge monitoring report data for wastewater treatment plants achieving low effluent phosphorus concentrations"***

The EPA Memorandum presents a review of effluent performance from a select group of low phosphorus treatment facilities. The memorandum suggests that effluent phosphorus of less than 50 ug/l can be attained and calculates the median effluent concentration of the plants selected for the memorandum as 35 ug/l.

Generally, the facilities selected in the EPA Memorandum are smaller and do not include the solids processing facilities and recycle return loadings that full scale facilities for discharge to the Spokane River will include which may impact effluent performance. Key Spokane River dischargers such as the City of Spokane, Spokane County, and the City of Coeur d'Alene are all larger than the largest of the facilities included in the EPA Memorandum, which ranged from 0.5 to 4 mgd. These Spokane River dischargers all include anaerobic digestion for solids stabilization and will have solids processing recycle loadings. None of the facilities in the EPA Memorandum include anaerobic digestion. Consequently, the suggestion that effluent phosphorus of less than 50 ug/l can be achieved by Spokane River dischargers based on dissimilar reference facilities does not appear to be appropriate.

The plants selected in the EPA Memorandum do not have daily effluent phosphorus data for review and analysis. Phosphorus data from the plants analyzed in the EPA Memorandum are from sampling conducted twice per week, one per week, or at an unknown frequency.

The EPA Memorandum suggests using a 95th percentile statistic of effluent performance is appropriate for Spokane River phosphorus discharges. This creates a communications issue since this approach deviates from past Spokane River TMDL discussions where the understanding was that longer term seasonal mean, or median values would be the basis for effluent phosphorus performance at 0.050 mg/l. Past analysis of reference facilities that considered mean performance have been conducted with this understanding. Since effluent limits are low and daily variability in effluent performance will be skewed to higher, rather than lower values, the 95th percentile statistics will be considerably higher than the mean values.

For example, the Clean Water Services Durham treatment plant that has been used as a reference facility for previous Spokane River discussions has a substantial record of low phosphorus effluent performance. The Durham plant has a monthly median limit of 0.110 mg/l from May 1 through October 31. The 2004 summer season daily data has a log normal mean of 0.102 mg/l. However, the 95th percentile of the 2004 data set is 0.284 mg/l. So, the Durham plant would not be capable of meeting its 0.110 mg/l permit limit if it were defined on a 95th percentile statistic, as suggested by the EPA Memorandum.

Overview of EPA Region 10 Memorandum

The EPA Memorandum presents a summary of previous publications and studies of low effluent phosphorus facilities. The treatment plants selected in the EPA Memorandum are not representative of the facilities in consideration for discharge to the Spokane River in terms of size, solids processing and stabilization facilities, and solid recycle loadings to the liquid stream treatment processes. Plants selected for the EPA Memorandum are relatively small (0.5 to 4 mgd) and have either aerobic digestion facilities or no solids stabilization facilities. The EPA memorandum omits any commentary on the importance of these factors on final effluent performance.

The EPA Memorandum presents summary reviews of the following documents:

- Municipal Nutrient Removal Technologies Reference Document (Office of Wastewater Management, September 2008)
- Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus (Region 10, April 2007)
- Achieving Low Effluent Total Phosphorus Concentrations: How Low Can We Go? (Stantec, Inc.)
- Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus (Dave Reynolds, CH2MHILL and Dave Clark, HDR, November 21, 2005)
- Spokane River TMDL Collaboration (Memorandum dated September 14, 2005 from Ryan Orth of Ross and Associates to Len Bramble of the Washington Department of Ecology and Lars Hendron of the City of Spokane

The EPA Memorandum selected nine facilities reporting low monthly average effluent phosphorus concentrations for analysis. Table 1 places the facilities included in the EPA Memorandum in a broader context of other facilities studied as part of the Spokane River TMDL collaboration. Table 1 summarizes the effluent phosphorus from the plants in the EPA Memorandum next to the plants included in the Exemplary Plants Memorandum (2005) and the EPA Region 10 Study of Advanced Wastewater Treatment Plants (2007). The Exemplary Plants Memorandum analysis was focused on characterizing a variety of reference treatment process trains employed at full-scale to achieve low effluent phosphorus. This analysis emphasized the use of daily performance data to the maximum extent possible in order to characterize effluent variability.

Table 1 shows that many of the plants in the EPA Memorandum have been analyzed as part of the past reports and fall into the smaller range of plant capacities that have been

studied. Effluent phosphorus results reported for the plants in the EPA Memorandum are similar, and in some cases higher, than the results presented previously.

Table 1. Comparison of Reported Effluent Results from EPA Region 10 Memorandum[1] with Summary of Exemplary WWTPs in U.S. Practicing High Phosphorus Removal[2] and EPA Region 10 Report[3]

Facility	Average Design Flow (mgd)	March 24, 2009 USEPA Region 10 Memorandum[1]	Exemplary Plants Final Effluent Log Normal Average Total Phosphorus[2] (µg/L)		USEPA Region 10 Advanced Wastewater Treatment Plant Report[3]	
		Maximum Monthly Average Phosphorus Concentration P (µg/L)[4]	Year 1	Year 2	Average Effluent P (µg/L)	Range of Monthly Average P (µg/L)
Las Vegas, Nevada	91	Not Reported[5]	179	152	Not Reported[7]	Not Reported[7]
Alexandria, Virginia	54	Not Reported[5]	134	88	65	40 - 100
Rock Creek (Portland area), Oregon	34	Not Reported[5]	82	71	70	40 - 90
Durham (Portland area), Oregon	25	Not Reported[5]	102	73	70	50 100
Cauley Creek (Atlanta area), Georgia	5.0	Not Reported[5]	123	86	Not Reported[7]	Not Reported[7]
Indian River County Utilities West Regional WWTF, Florida	4.0	25	Not Reported[6]	Not Reported[6]	Not Reported[7]	Not Reported[7]
Snake River WWTP, Colorado	2.6	40	Not Reported[6]	Not Reported[6]	15	10 - 40
Lone Tree (Arapahoe County) Colorado	2.4	48	40	30	Not Reported[7]	Not Reported[7]
Walton, New York	1.6	25		8[8]	<10	<5 - <6
Iowa Hill (Breckenridge), Colorado	1.5	23	9	8	55	17 to 130
Farmer's Korner, Colorado	1.5	23	Not Reported[6]	Not Reported[6]	7	2 - 36
Stonegate Village WWTP	1.1	35	Not Reported[6]	Not Reported[6]	Not Reported[7]	Not Reported[7]
Pinery, Colorado	1.0	55	29	31	29	21 - 74
Grand Gorge STP, New York	0.50	50	Not Reported[6]	Not Reported[6]	<40	0 - 50

Facility	Average Design Flow (mgd)	March 24, 2009 USEPA Region 10 Memorandum[1]	Exemplary Plants Final Effluent Log Normal Average Total Phosphorus[2] (µg/L)		USEPA Region 10 Advanced Wastewater Treatment Plant Report[3]	
		Maximum Monthly Average Phosphorus Concentration P (µg/L)[4]	Year 1	Year 2	Average Effluent P (µg/L)	Range of Monthly Average P (µg/L)
Stamford, New York	0.5	21		20	<11	<5 - <6

[1] USEPA Region 10, Memorandum from Brian Nickel of EPA Region 10 to David Moore of Washington Ecology, "Subject: Summary of previous reports and discharge monitoring report data for wastewater treatment plants achieving low effluent phosphorus concentrations," March 24, 2009.
[2] November 21, 2005 "Evaluation of Exemplary WWTPs Practicing High Removal of Phosphorus". Year 1 data is generally 2004 and Year 2 is generally a portion of the year 2005.
[3] USEPA Region 10, "Advanced Wastewater Treatment to Achieve Low Concentration of Phosphorus," EPA 910-R-07-002, April 2007
[4] From Table 6 of EPA Memorandum with the Exception of Indian River County Utilities West Regional WWTF values taken from Table 7.
[5] Not included in EPA Memorandum
[6] Not included in Exemplary Plants review
[7] Not include in EPA Region 10 Report.
[8] Corrected Walton effluent performance data from certified laboratory presented in August 16, 2006 Advanced Treatment Process Evaluation Workshop and supersedes results reported in the original Exemplary Plants Memorandum.

The EPA Memorandum discusses a recent EPA publication titled "Municipal Nutrient Removal Technologies Reference Document" (September 2008) evaluating the performance and costs of facilities removing nitrogen and phosphorus. EPA examined effluent nitrogen and phosphorus performance at 29 full scale treatment plants in the United States and one in Canada. Detailed process information and costs were analyzed for more than 40 different treatment technologies for removing nitrogen and phosphorus from municipal wastewater. Nine facilities were studied in depth with case studies presented in an appendix.

Table 2 summarizes the effluent phosphorus from 16 facilities included in the EPA Reference Document. The EPA Memorandum selectively presents effluent phosphorus results from just three of the smallest of these facilities that report the lowest effluent phosphorus.

Table 2. Summary of Low Phosphorus Facilities Reported in EPA Municipal Nutrient Removal Technologies Reference Document[1]

Facility	Average Effluent P (mg/L)	Treatment Process
Penticton, British Columbia	0.3	University of Cape Town (UCT) process with filter
Genesee County, Michigan,	0.24	Anoxic/oxic (A/O) process (no chemical and no filter)
Kelowna, British Columbia	0.139	Westbank process with fermenter and filter
Clean Water Services Durham, Oregon	0.132	A2O with volatile fatty acid (VFA), chemical, tertiary clarifier, and filter
Kallspell, Montana	0.12	Modified UCT with fermenter and filter
Clark County, Nevada	0.10	A/O with filter
Truckee Meadows, Nevada	< 0.1	PhoStrip with filter
Lee County, Florida	0.098	Oxidation ditch with denitrification filter with alum
Chelsea, Michigan	0.090	Chemical addition with flocculating clarifier
Fairfax County, Virginia	0.090	Step-feed AS with fermenter and filter
Hyrum, Utah	0.070	Membrane bioreactor
McMinnville, Oregon	0.058	Chemical addition with tertiary clarifier and filter,
Pinery, Colorado[2]	0.031	5-Stage Bardenpho with chemical and filter
Lone Tree Creek, Colorado[2]	0.027	Membrane bioreactor
Breckenridge, Colorado[2]	0.010 (literature report)	Enhanced biological phosphorus removal with chemical addition and filter
Brighton, Michigan	0.01	Chemical addition with tertiary filter and infiltration basin (land treatment process elimnated from consideration in EPA Memorandum)

[1] Source: Table ES-1, EPA. 2008. Municipal Nutrient Removal Technologies Reference Document, Volume 1 – Technical Report. EPA 832-R-08-006. Washington, DC.
[2] Included in USEPA Region 10, Memorandum from Brian Nickel of EPA Region 10 to David Moore of Washington Ecology, "Subject: Summary of previous reports and discharge monitoring report data for wastewater treatment plants achieving low effluent phosphorus concentrations," March 24, 2009.

The EPA Memorandum offers little insight into factors important in governing how low effluent phosphorus effluent can be accomplished. No new information is provided about treatment technologies or the factors determining effluent performance. The important

results from local pilot testing of low phosphorus treatment technologies specific to local wastewater chemistry are not included in the EPA Memorandum.

In contrast, the EPA Reference Document (2008) cites a number of factors that are key to low effluent phosphorus performance:

> *"The key factors included, for biological removal, an adequate supply of VFAs in the wastewater (and the use of a fermenter to generate additional VFAs where needed), the size of the anaerobic and aerobic zones, the number of swing zones, the sludge age, the control of secondary release, and the depth of the sludge blanket in the secondary clarifier. For chemical removal, the key factors included the number of chemical application points, the dosage, the need for a tertiary clarifier, and the type of filters for final polishing. Management of recycle flows is another key factor for reliable operations."*

By selecting only small facilities that do not include anaerobic digestion facilities, the EPA Memorandum ignores one of the most significant challenges in achieving low effluent phosphorus. Larger wastewater facilities generally employ anaerobic digestion to efficiently stabilize solids removed in the treatment process, reduce the quantity of solids produced, and recover energy from digester gas production. Thickening and dewatering recycled loadings from solids processing must be addressed and while their impact can be reduced in the design of the treatment process, recycle loadings remain a significant challenge to accommodate in the liquid stream process. Significantly, liquid stream performance cannot be enhanced at the expense of the solids stream in larger plants with complete solids processing through thickening, anaerobic digestion, and dewatering.

The EPA Memorandum attempts to address the issue of plant size by suggesting that the treatment technologies included in the memorandum "can be scaled to larger facilties." Little consideration is given to the other factors that may be important in making a treatment process selection, such as the construction cost for facilities, operating costs, chemical use, solids generated, physical plant site space requirements, etc. These are important factors. Some of the technologies included in the EPA Memorandum, such as dual sand filtration with chemical, have never been built at a capacity greater than 2 to 4 mgd. Other treatment process trains in the EPA Memorandum are one-of-a-kind systems that exist in only one location.

The EPA Memorandum makes reference to a proposal from Veolia Water North American offering a process guarantee of effluent phosphorus less than 0.050 mg/l. It should be noted that this Veolia offering was made in a proposal marketing effort for the Spokane Country Regional Water Reclamation Facility as part of a proposal for the design/build/operation (DBO) contract procurement process. This proposal was based on a treatment process train that has never been built or operated in a full scale facility. This proposal was not selected based on a detailed technical review.

Treatment Process Pilot Studies Provide Spokane River Specific Results

No consideration is given in the EPA Memorandum to the site specific low phosphorus treatment pilot studies that have been conducted to investigate the limits of treatment technologies with local wastewater for discharge to the Spokane River. The City of Spokane, City of Coeur d'Alene, and Inland Empire Paper each have conducted well designed and carefully managed pilot testing programs using multiple treatment technologies with well documented results.

Table 3 presents a summary of the pilot testing results from 2006 in Coeur d'Alene. Four technologies from different manufacturers were tested on their ability to reliably produce low effluent phosphorus concentrations:

- Zenon ZeeWeed™ 500 Ultrafiltration (ZW-500)
- US Filter Trident® HS-1 (THS-1)
- Parkson DynaSand D2 Advanced Filtration System (DSD2)
- Blue Water Dual-Stage Blue PRO™ (DSBP)

The best performance in the pilot tests resulted in effluent total phosphorus of 19 to 24 ug/l. Pilot studies represent the most ideal operational conditions possible and are isolated from the impacts of variable flows, peak loadings, and solids processing recycle return impacts. Full scale facilities would not be isolated from these impacts and therefore not be expected to be capable of sustained effluent performance at levels as low as in pilot testing.

Even under controlled circumstances at pilot scale and constant flow conditions, some technologies were unable to attain effluent concentrations as low as reported for some of the plants in the EPA Memorandum. For example, pilot testing with the Parkson Dual sand process with alum addition averaged about 40 ug/l. The EPA Memorandum reports that full scale facilities with this technology in Stamford, NY and Walton, NY have maximum monthly effluent phosphorus of 21 and 25 ug/l, respectively.

A key finding in pilot testing of tertiary treatment technologies in Coeur d'Alene is that effluent phosphorus composition varies between soluble and particulate phosphorus, and reactive and nonreactive phosphorus components. This data provides key insights as to the removal mechanisms in treatment and the potential for achieving low effluent phosphorus concentrations. The treatment technologies employ a variety of mechanisms to remove phosphorus and Table 3 illustrates the results in terms of phosphorus speciation. The membrane filter provides an absolute barrier to suspended solids and as a result, little or no particulate phosphorus remains after membrane filtration. Treatment processes that had difficulty capturing solids produced effluent with high particulate phosphorus, as can be seen in the Parkson dual sand filter results.

A key finding from pilot testing on local wastewater is that all treatment technologies produced a soluble nonreactive phosphorus component that is not biodegradable and cannot be removed by chemical precipitation or filtration. The soluble nonreactive

phosphorus concentration in the effluent from the pilot technologies ranged from 11 to 15 ug/l and suggests that no treatment technologies currently available will be able to achieve effluent below these levels. All, or a portion of this soluble nonreactive component that is not biodegradable in treatment may not be bioavailable in the Spokane River.

Table 3. Low Phosphorus Pilot Testing Summary from Coeur d'Alene[1]

Phosphorus Species	Zenon Ultrafiltration Membrane (ZW-500)	Trident High Solids Process (THS-1)	BlueWater Dual Sand Filtration (DSBP)	Parkson Dual Sand Filtration (DSD2)
Total Phosphorus (TP), µg/L	24.1	19.2	21.4	39.6
Soluble Total Phosphorus (sTP), µg/L	23.3	13.0	17.2	18.8
Soluble NonReactive Phosphorus (sNRP), µg/L	14.9	10.8	14.9	13.4
Soluble Reactive Phosphorus (sRP), µg/L	8.4	2.2	2.3	5.3
Particulate Phosphorus (pP), µg/L	0.9	6.2	4.2	30.9

[1] City of Coeur d'Alene, "Tertiary Phosphorus Removal Technology Pilot Study," HDR Engineering, Inc. January 2007

EPA Memorandum Part 2: Analysis of Effluent Data

The EPA Memorandum presents a statistical summary (percentiles, averages) for ten treatment facilities and the percentage of the time the average monthly concentrations are less than or equal to certain concentrations. The plants selected in the EPA Memorandum do not have daily effluent phosphorus data for review and analysis. Phosphorus data from the plants analyzed in the EPA Memorandum are from sampling conducted twice per week, one per week, or at an unknown frequency. Consequently, much of the variability in effluent performance may not be characterized by these data sets with infrequent sampling. Based on this analysis, the EPA Memorandum suggests a 95th percentile statistic of effluent performance is appropriate for Spokane River phosphorus discharges.

Historical discussions of effluent phosphorus limits for the Spokane River have been based on an understanding that long averaging periods and mean or median values would be used as reference points for discharge limits. Plant performance at other facilities was reviewed in this context. Introduction of the 95th percentile statistic of effluent clouds the past discussions that were the based on mean or median effluent phosphorus performance at 0.050 mg/l. Since effluent performance variability will be skewed to higher, rather than lower values, the 95th percentile statistics for plants with average performance near 0.050 mg/l will be considerably higher.

Surface water phosphorus discharges should receive special considerations for distinction from other effluent parameters, in particular toxic parameters, upon which much of the existing EPA permit writer's guidance is based. Appropriate NPDES discharge permit structures for nutrients should be based on long averaging periods, such as seasonal limits based on mean or median statistics. Its important that consideration be given to variability and reliability of effluent performance from advanced phosphorus removal facilities. Appropriate NPDES permit structures will avoid the creation of frameworks that result in compliance issues that are immaterial to surface water quality protection, such as maximum daily and maximum weekly limits, overly restrictive receiving water streamflow assumptions, and the assumption of extreme and improbable coincident events, such as statistical extremes occurring in both receiving waters and effluent discharge quality.

Exhibit 3

"Knight, David T. (ECY ERO)" <DKNI461@ECY.WA.GOV>

06/23/2009 11:10 AM

To: Laurie Mann/R10/USEPA/US@EPA

cc: "Bellatty, James (ECY)" <JBEL461@ECY.WA.GOV>, "Moore, David (ECY)" <DMOO461@ECY.WA.GOV>

Subject: RE: Edited draft report

Hi Laurie; we are discussing the modeling results here. I was hoping to conference call with you before the results get released. At first glance, Dave and I are inclined to go with Scenario 1 or 3, because they appear to be the most conservative of the runs. In reading the report, I became a little concerned about the statement; "TMDL alternative #2 had slightly lower dissolved oxygen concentrations than those for TMDL#1 and TMDL#3". If we agree that either #1 or #3 are the more desirable of the runs, I think we will run into opposition from the dischargers on the word "slightly". What does slightly mean, and why not use scenario 2 if the differences are slight? Are we going to be able to quantify the differences in the 3 runs prior to Thursday, and what will be our criteria for selecting the best run? Do you have time around 1:30 this afternoon to talk? Thanks.....DK

From: Mann.Laurie@epamail.epa.gov [mailto:Mann.Laurie@epamail.epa.gov]
Sent: Tuesday, June 23, 2009 9:33 AM
To: Moore, David (ECY); Knight, David T. (ECY ERO)
Subject: Fw: Edited draft report

Dave and Dave,
I am seeking your permission to send out the draft PSU report to the Stakeholders. I'll send it as a pdf. Ben edited the riverine assessment point language on page 14.

Laurie Mann 206.553.1583
U.S. Environmental Protection Agency
Environmental Engineer
TMDL Program
1200 Sixth Avenue, Suite 900, OWW-134
Seattle, WA 98101-3140
http://www.epa.gov/r10earth/tmdl.htm

----- Forwarded by Laurie Mann/R10/USEPA/US on 06/23/2009 09:35 AM -----

Ben Cope/R10/USEPA/US

Exhibit 4

Brian Nickel/R10/USEPA/US
07/02/2009 03:47 PM

To Dave Moore
cc Ben Cope/R10/USEPA/US@EPA, Laurie Mann/R10/USEPA/US@EPA
bcc
Subject Analysis of P at Segment 154

Hi Dave,

As I mentioned in our meeting this morning, I did some calculations on the time series model output from segment 154. Here are the results of that.

Scenarios 1 and 3 both result in a March - October average phosphorus concentration at segment 154 of 10 ppb; scenario 2 is about 11 ppb. Considering each model output data point, scenarios 1 and 3 result in a P concentration at 154 less than or equal to 10 ppb, 65% of the time, from March - October; this drops to 62% for scenario 2. See the attached file.

The language in the ecoregional criteria document regarding averaging periods is as follows:
"EPA does not recommend identifying nutrient concentrations that must be met at all times, rather a seasonal or annual averaging period (e.g., based on weekly measurements) is considered appropriate. However, these seasonal or annual central tendency measures should apply each season or each year, except under the most extraordinary of conditions (e.g., a 100 year flood)." (See Page 6).
http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/rivers/rivers_2.pdf

Thanks,

Brian Nickel, E.I.T.

Environmental Engineer
US EPA Region 10 | Office of Water and Watersheds | NPDES Permits Unit
Voice: 206-553-6251 | Toll Free: 800-424-4372 ext. 6251 | Fax: 206-553-0165
Nickel.Brian@epa.gov
http://epa.gov/r10earth/waterpermits.htm
Please conserve natural resources by not printing this message.

Segment 154 P Analysis.xls

TP March - October Segment 154

	Minimum	10th Percentile	Median	Average	90th Percentile	Maximum
Alternative #1	0.007	0.008	0.009	0.010	0.013	0.026
Alternative #2	0.007	0.008	0.010	0.011	0.014	0.027
Alternative #3	0.007	0.008	0.009	0.010	0.014	0.027
No Source	0.003	0.004	0.007	0.0066	0.009	0.016

% of Time Less than or Equal to 10 ppb	
Alternative #1	65%
Alternative #2	62%
Alternative #3	65%

Exhibit 5

LimnoTech
Water | Environment | Scientists | Engineers

DATE: September 1, 2009

MEMORANDUM

FROM: David Dilks, Joseph Helfand

PROJECT: CDAL09

TO: Sid Fredrickson

CC: Kris Holm, James Tupper, Dave Clark

SUBJECT: **Results of CE-QUAL-W2 Model Sensitivity Analyses in Response to Different Levels of Idaho Point Source Discharge**

Summary

LimnoTech conducted a series of simulations using the most recent version of the CE-QUAL-W2 model to define the incremental dissolved oxygen impact in Long Lake associated with different levels of phosphorus and ammonia in the effluent of Idaho point source discharges. Ammonia permit limits of 8 mg/L for Idaho discharges resulted in a decrease in dissolved oxygen of less than 0.01 mg/l at the critical Long Lake segment during the critical late August period, compared to TMDL Alternative #1. This incremental impact is very small and likely less than a level that the model is capable of distinguishing. Total phosphorus limits of 100 and 200 ug/L for the Idaho discharges resulted in incremental dissolved oxygen decreases of 0.01 and 0.05 mg/l, respectively. These incremental decreases associated with higher phosphorus limits are only 0.7 to 3% of the decrease in critical dissolved oxygen associated with TMDL Alternative #1.

Background

U.S. EPA and Washington Department of Ecology are developing a Total Maximum Daily Load for nutrients and oxygen demanding materials designed to minimize the anthropogenic affects on dissolved oxygen in Long Lake. A series of draft TMDL scenarios have been run to date (PSU, 2009), with all simulations assuming an ammonia permit limit of 1.0 mg/l and phosphorus permit limit of 50 ug/l for Idaho point source dischargers.

The purpose of this work is to examine the incremental impact of Idaho point source (i.e. Coeur d'Alene, Post Falls, and Hayden) ammonia and phosphorus discharges on Long Lake dissolved oxygen as predicted by the most recent version of CE-QUAL-W2. This memorandum documents the analyses that were conducted, and is divided into sections discussing:

- Scenarios Evaluated
- Model Results

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Scenarios Evaluated

The Draft Spokane River Management Scenarios Report (PSU, 2009) examined four alternative scenarios, corresponding to one "no source" scenario and three alternative TMDL scenarios. All scenarios were conducted using Year 2001 flows. TMDL Alternative #1, which corresponds to point sources set at a 50 ppb TP maximum monthly average and nonpoint sources set to achievable reductions, was used as the basis for this Idaho sensitivity analysis. Four simulations were conducted, and summarized in Table 1. TMDL Alternative #1 was first run, completely unchanged from what was provided by EPA. The second simulation changed TMDL Alternative #1 by adjusting the assumed Idaho ammonia permit limits from 1.0 mg/l to 8.0 mg/l. The assumed increase in ammonia concentrations was counterbalanced by a decrease in nitrate concentration. A comparison of the difference in predicted Long Lake dissolved oxygen concentrations between these two simulations will demonstrate the incremental water quality effect of a change in ammonia concentration from the Idaho point sources.

Table 1. Scenarios Examined

Scenario	Assumed Idaho Ammonia Limit* (mg/l)	Assumed Idaho Phosphorus Limit* (ug/l)
TMDL Alternative #1	1.0	50
Increased Ammonia	8.0	50
TP = 100 ug/l	1.0	100
TP = 200 ug/l	1.0	200

*Model input concentrations were set at 71% of the permit limit values for ammonia and phosphorus, representing the wasteload allocation following the procedure used in PSU(2009)

The third and fourth simulations investigated the dissolved oxygen impact of higher phosphorus concentrations in the Idaho effluent. The third simulation changed TMDL Alternative #1 by adjusting the assumed Idaho phosphorus permit limits from 50 ug/l to 100 ug/l. The fourth simulation changed TMDL Alternative #1 by adjusting the assumed Idaho phosphorus permit limits from 50 ug/l to 200 ug/l. Predicted Long Lake dissolved oxygen concentrations for each of these simulations, compared to the results from TMDL Alternative #1, will demonstrate the incremental water quality effect of changes in phosphorus concentration from the Idaho point sources.

Each scenario simulation consisted of three sequential model runs, as structured by PSU. The first simulation considers the Idaho portion of the Spokane River, the second simulation considers the Washington portion of the Spokane River, and the third simulation considers Long Lake. Model predictions at the downstream boundary of each of the first two simulations are directly passed to serve as input for the upstream boundary for the next simulation in the sequence.

Analysis of model results focused on the "special output" provided by PSU for the Long Lake TMDL, which corresponds to semi-monthly average minimum dissolved oxygen in the hypolimnion of each model segment. Particular focus was given to late August dissolved oxygen

predictions for model segment 36 (formerly referred to as segment 188), which the draft TMDL scenarios identified as the critical time and location for dissolved oxygen impacts.

Model Results

The scenarios in Table 1 were run on single processor computers, and the incremental impact of alternative Idaho effluent limits on Long Lake dissolved oxygen was examined. The results are shown in Table 2 for the critical lake segment and time period. The increased Idaho ammonia discharge is predicted to decrease minimum hypolimnetic dissolved oxygen by 0.0077 mg/l, which is likely an amount smaller than can be accurately discriminated by the model. The incremental impact of the increased phosphorus limits are 0.011 and 0.045 mg/l respectively. The PSU (2009) Scenarios report indicated that TMDL Alternative #1 would decrease the critical dissolved oxygen in Long Lake by 1.5 mg/l. The incremental oxygen decreases of 0.011 and 0.045 mg/l associated with higher Idaho phosphorus limits correspond to only 0.7 to 3.0 % of this deficit.

Table 2. Incremental Dissolved Oxygen Impacts at Critical Segment and Time

Scenario	Incremental Impact (mg/l)
Increased Ammonia	-0.0077
TP = 100 ug/l	-0.011
TP = 200 ug/l	-0.045

A complete listing on incremental impacts at all Long Sake segments and times is provided in the appendix.

References

Portland State University, 2009. DRAFT Spokane River Management Scenarios Report. Technical Report EWR-04-09. Water Quality Research Group. Department of Civil and Environmental Engineering. Maseeh College of Engineering and Computer Science. June, 2009

Appendix
Incremental Dissolved Oxygen Impact (mg/) at All Segments and Times

These tables represent the incremental dissolved oxygen impacts associated with each scenario, and are created by calculating the difference between the scenario output and the results from TMDL Alternative #1. Negative numbers indicate that the scenario results in a lower dissolved oxygen than predicted by TMDL Alternative #1.

Increased Ammonia Scenario

Long Lake					Julian Day							
segment	121	136	152	167	182	197	213	228	244	259	274	289
5	-0.0402	-0.0007	-0.0281	0.0673	-0.0618	-0.0008	-0.0022	-0.0012	-0.0027	-0.0038	-0.004	-0.008
6	-0.0645	-0.0018	0.002	0.005	-0.0246	0.0042	-0.0033	-0.0007	-0.002	-0.0036	-0.006	-0.008
7	-0.038	-0.0019	-0.0033	-0.0002	-0.0282	0.0002	-0.0005	-0.0014	-0.0019	-0.0039	-0.006	-0.007
8	0.011	-0.0027	-0.0042	0.0033	-0.0373	0	-0.0009	-0.0012	-0.0016	-0.0042	-0.006	-0.007
9	0.006	-0.0049	-0.005	-0.0038	-0.0365	0.0005	-0.0009	-0.0009	-0.0013	-0.0035	-0.007	-0.007
10	0	-0.0053	-0.0123	0	-0.0291	0.0003	-0.0012	-0.0007	-0.0006	-0.0026	-0.006	-0.006
11	0.005	-0.0061	-0.0164	-0.005	-0.026	-1E-04	-0.0008	-0.0002	-0.0004	-0.0022	-0.006	-0.006
12	0.004	-0.0059	-0.0129	-0.0083	-0.0355	-0.0008	-0.0016	-0.0004	-0.0004	-0.0025	-0.0054	-0.006
13	-0.003	-0.0062	-0.011	-0.008	-0.0326	-0.0014	-0.0005	-0.0006	0.0006	-0.0017	-0.0043	-0.006
14	0.005	-0.0071	-0.0123	-0.0162	-0.0321	-0.0003	0.0016	-0.0009	0.0006	-0.0023	-0.0043	-0.006
15	0.006	-0.007	-0.011	-0.0182	-0.034	-0.0016	0.0013	-0.0004	0.0006	-0.0019	-0.004	-0.006
16	0.007	-0.0071	-0.014	-0.0161	-0.0539	-0.0045	0.0021	-0.0003	0.0005	-0.0014	-0.0039	-0.005
17	0.016	-0.0074	-0.017	-0.0226	-0.0517	-0.0077	0.0017	-0.0014	0.0002	-0.0014	-0.0036	-0.004
18	0.002	-0.008	-0.018	-0.0277	-0.0591	-0.0097	0.001	-0.0033	-0.001	-0.0016	-0.0032	-0.003
19	-0.006	-0.008	-0.015	-0.0338	-0.066	-0.0107	0.0022	-0.0025	-0.0017	-0.0012	-0.0027	-0.0025
20	-0.007	-0.006	-0.0117	-0.0269	-0.0725	-0.0145	0.0003	-0.0025	-0.0028	-0.002	-0.0026	-0.0016
21	-0.007	-0.008	-0.0126	-0.0215	-0.0593	-0.0167	-0.0019	-0.0018	-0.0031	-0.0035	-0.0028	-0.0012
22	-0.003	-0.007	-0.0141	-0.0175	-0.0555	-0.0188	-0.0045	-0.0025	-0.0037	-0.0048	-0.003	-0.0014
23	-0.005	-0.008	-0.0128	-0.014	-0.0642	-0.0191	-0.0062	-0.0034	-0.0047	-0.0059	-0.0026	-0.0013
24	-0.005	-0.007	-0.0126	-0.004	-0.0629	-0.0196	-0.0064	-0.0042	-0.0046	-0.0054	-0.0024	-0.0008
25	-0.008	-0.007	-0.0141	-0.0027	-0.0574	-0.0212	-0.0086	-0.0063	-0.0058	-0.006	-0.0028	-0.0014
26	-0.004	-0.008	-0.0167	-0.0019	-0.0371	-0.0201	-0.0077	-0.0063	-0.0058	-0.0046	-0.0031	-0.0015
27	-0.006	-0.009	-0.0141	-0.0082	-0.0344	-0.0198	-0.0075	-0.0065	-0.0057	-0.0028	-0.0034	-0.0014
28	-0.009	-0.0096	-0.0133	-0.009	-0.0309	-0.0186	-0.0075	-0.0063	-0.0051	-0.0017	-0.0032	-0.0018
29	-0.011	-0.0096	-0.0125	-0.0104	-0.0242	-0.0179	-0.0083	-0.0063	-0.0048	0.0005	-0.0036	-0.0022
30	-0.008	-0.0091	-0.0122	-0.0202	-0.0213	-0.017	-0.0078	-0.0054	-0.0055	0.0004	-0.0036	-0.0022
31	-0.011	-0.0103	-0.0143	-0.018	-0.0234	-0.0168	-0.0091	-0.0064	-0.0051	-0.0006	-0.0028	-0.0023
32	-0.01	-0.0108	-0.019	-0.016	-0.0243	-0.0163	-0.0104	-0.0055	-0.0053	-0.0031	-0.0037	-0.0024
33	-0.008	-0.0105	-0.0201	-0.0121	-0.0276	-0.015	-0.0121	-0.0052	-0.0051	-0.0042	-0.0056	-0.0039
34	-0.016	-0.0098	-0.0137	-0.0121	-0.0293	-0.0149	-0.0145	-0.0064	-0.0063	-0.0061	-0.0069	-0.0055
35	-0.014	-0.01	-0.0131	-0.0124	-0.0273	-0.0146	-0.0159	-0.0068	-0.0068	-0.0082	-0.0072	-0.006
36	-0.003	-0.0099	-0.0111	-0.0106	-0.021	-0.0139	-0.016	-0.0077	-0.0073	-0.0109	-0.0144	-0.0098

TP = 100 ug/l Scenario

Long Lake					Julian Day							
segment	121	136	152	167	182	197	213	228	244	259	274	289
5	0.0242	0.0019	0.047	0.0062	-0.0329	-0.0019	-0.0017	-0.0016	0.002	-0.0003	0	-0.049
6	0.014	0.0016	0.0293	0.006	-0.0022	0.0015	-0.0031	-0.0016	0.0011	-0.0013	-0.004	0.001
7	-0.1061	0.0017	0.0086	0.0024	-0.0026	-0.0032	-0.0029	-0.0024	0.0002	-0.0016	-0.003	0.002
8	0.007	0.0027	0.0006	0.0129	-0.0047	-0.004	-0.0038	-0.0027	0.0002	-0.0046	-0.003	-0.004
9	0.009	0.0053	-0.0084	0.0061	-0.0057	-0.0041	-0.0036	-0.0024	-0.0005	-0.0046	-0.004	-0.004
10	0.007	0.0067	-0.0169	0.0063	-0.0059	-0.004	-0.0035	-0.0021	-0.0006	-0.005	-0.004	-0.003
11	0.005	0.007	-0.0211	0.0059	-0.0066	-0.0035	-0.0028	-0.0023	-0.0004	-0.0048	-0.004	-0.003
12	0.015	0.0072	-0.016	-0.0023	-0.0061	-0.0035	-0.0037	-0.0032	-0.0006	-0.004	-0.0037	-0.002
13	0.004	0.0083	-0.011	0.003	-0.0059	-0.0041	-0.0049	-0.0051	-0.0018	-0.0046	-0.0017	-0.002
14	-0.004	0.009	-0.007	0.0004	-0.01	-0.0062	-0.006	-0.0064	-0.0029	-0.0067	-0.002	-0.002
15	-0.005	0.009	-0.006	-0.0024	-0.0122	-0.0099	-0.0071	-0.0075	-0.0034	-0.0077	-0.0023	-0.002
16	0	0.009	-0.019	-0.004	-0.0116	-0.0153	-0.0081	-0.011	-0.0047	-0.0087	-0.0034	-0.002
17	0.013	0.0093	-0.018	-0.0083	-0.0135	-0.0177	-0.0089	-0.0126	-0.0074	-0.0098	-0.0037	-0.001
18	0.006	0.01	-0.011	-0.0099	-0.018	-0.0183	-0.0094	-0.0147	-0.0102	-0.0112	-0.004	0
19	0.002	0.011	0.001	-0.0145	-0.0181	-0.0179	-0.0096	-0.0141	-0.0114	-0.0127	-0.0045	-0.0003
20	0.011	0.013	0.002	-0.0155	-0.0208	-0.0205	-0.0115	-0.0148	-0.0143	-0.0159	-0.0057	0.0004
21	0.007	0.012	0.0023	-0.0132	-0.0237	-0.0223	-0.014	-0.0142	-0.0147	-0.018	-0.0061	0.0002
22	0.008	0.012	-0.0112	-0.0134	-0.0243	-0.0231	-0.0152	-0.0144	-0.0128	-0.0197	-0.0083	-0.0005
23	0.012	0.012	-0.0188	-0.0138	-0.0235	-0.0227	-0.0157	-0.0139	-0.0134	-0.0196	-0.0094	-0.0007
24	0.011	0.013	-0.0142	-0.0115	-0.0275	-0.023	-0.0173	-0.0152	-0.0129	-0.0181	-0.0101	-0.0008
25	0.01	0.011	-0.0166	-0.0099	-0.0258	-0.021	-0.0162	-0.0138	-0.0097	-0.0174	-0.0121	-0.0017
26	0.025	0.012	-0.0152	-0.0069	-0.0086	-0.0195	-0.0162	-0.0131	-0.0079	-0.0146	-0.0115	-0.0019
27	0.029	0.013	-0.0095	-0.0054	-0.0089	-0.0197	-0.018	-0.0143	-0.0085	-0.0135	-0.0128	-0.0023
28	0.022	0.014	-0.01	-0.0052	-0.0105	-0.0185	-0.0193	-0.0151	-0.0088	-0.0109	-0.0133	-0.0037
29	0.025	0.0137	-0.0141	-0.0051	-0.011	-0.0201	-0.0219	-0.0184	-0.01	-0.008	-0.0155	-0.0046
30	0.019	0.015	-0.0141	-0.0049	-0.0064	-0.0204	-0.0224	-0.0191	-0.0107	-0.006	-0.015	-0.0041
31	0.02	0.0143	-0.0123	-0.004	-0.0057	-0.0185	-0.0201	-0.0173	-0.0084	-0.0054	-0.014	-0.006
32	0.033	0.0157	-0.0195	-0.0029	-0.0049	-0.017	-0.0187	-0.0159	-0.0062	-0.003	-0.0099	-0.0049
33	0.036	0.0172	-0.0187	1E-04	0.0024	-0.0156	-0.0162	-0.0142	-0.0041	-0.0015	-0.0062	0.0004
34	0.036	0.0159	-0.0057	0.0003	0.0024	-0.0153	-0.0161	-0.0152	-0.0066	-0.003	-0.0081	0.0001
35	0.03	0.0148	-0.0034	-0.0005	0.0005	-0.0176	-0.0182	-0.0174	-0.0089	-0.0055	-0.0061	-0.0005
36	0.064	0.0215	0.0021	0.0058	0.0064	-0.0118	-0.0121	-0.011	-0.0043	-0.0013	0.0068	0.0151

TP = 200 ug/l Scenario

Long Lake					Julian Day							
segment	121	136	152	167	182	197	213	228	244	259	274	289
5	-0.0153	0.0019	0.0653	0.1284	0.0194	-0.003	-0.001	-0.0031	0.0007	0.0083	0.001	-0.001
6	-0.0642	0.0026	0.0247	-0.0058	0.0067	-0.0006	-0.0025	-0.0041	-0.0014	0.0045	-0.004	-0.002
7	-0.037	0.0053	0.0038	-0.007	-0.0106	-0.0071	-0.0041	-0.0045	-0.0034	0.0009	-0.003	0.001
8	0.015	0.0055	-0.0118	0.0073	-0.0081	-0.0057	-0.0054	-0.0055	-0.0042	-0.0054	-0.003	-0.004
9	0.006	-0.0009	-0.0179	-0.0021	-0.0066	-0.0068	-0.0052	-0.0049	-0.004	-0.0051	-0.002	-0.003
10	0.006	-0.0048	-0.0374	0.0049	-0.0031	-0.007	-0.0051	-0.0047	-0.0031	-0.0054	-0.001	0
11	0.001	-0.0046	-0.0396	0.0049	-0.0028	-0.0069	-0.0043	-0.0045	-0.0018	-0.0025	0	0.006
12	-0.009	-0.0049	-0.0278	-0.0009	-0.0049	-0.0078	-0.0057	-0.0062	-0.0016	-0.0019	0.001	0.007
13	-0.011	-0.0063	-0.021	-0.002	-0.0028	-0.0081	-0.0065	-0.0088	-0.0014	-0.0034	0.0031	0.008
14	0.007	-0.0072	-0.0166	-0.0112	-0.0087	-0.0122	-0.008	-0.0118	-0.0032	-0.0076	0.0013	0.007
15	0.002	-0.007	-0.0221	-0.0093	-0.0112	-0.0222	-0.0108	-0.0138	-0.0044	-0.0092	0.0005	0.006
16	-0.002	-0.0078	-0.03	-0.0094	-0.0259	-0.032	-0.0163	-0.0201	-0.0064	-0.0124	-0.0017	0.006
17	-0.007	-0.0076	-0.027	-0.0161	-0.0239	-0.0336	-0.0187	-0.0217	-0.0101	-0.0152	-0.0025	0.006
18	-0.017	-0.007	-0.027	-0.0217	-0.0225	-0.0331	-0.0214	-0.0232	-0.011	-0.0186	-0.0037	0.006
19	-0.01	-0.008	-0.022	-0.027	-0.0261	-0.0306	-0.0228	-0.024	-0.0118	-0.0222	-0.0078	0.0056
20	-0.009	-0.008	-0.0201	-0.0244	-0.0295	-0.0339	-0.0285	-0.0271	-0.0158	-0.0286	-0.0084	0.0065
21	-0.011	-0.009	-0.0198	-0.0247	-0.0353	-0.0364	-0.0341	-0.0308	-0.0182	-0.0348	-0.0099	0.0057
22	-0.011	-0.008	-0.032	-0.0248	-0.0305	-0.0383	-0.0368	-0.0346	-0.0204	-0.0406	-0.0148	0.004
23	-0.01	-0.008	-0.0386	-0.0238	-0.0336	-0.0377	-0.0375	-0.0352	-0.0207	-0.0422	-0.0168	0.0035
24	-0.007	-0.006	-0.0279	-0.0176	-0.0358	-0.0395	-0.0397	-0.0381	-0.0227	-0.0402	-0.0189	0.0028
25	-0.004	-0.008	-0.0283	-0.0165	-0.0366	-0.0387	-0.04	-0.0403	-0.0261	-0.0437	-0.0248	0.0008
26	0.004	-0.007	-0.0299	-0.0105	-0.0345	-0.0379	-0.0403	-0.0405	-0.0268	-0.0408	-0.0258	0
27	0.005	-0.007	-0.0265	-0.0102	-0.0326	-0.0387	-0.0416	-0.0422	-0.0287	-0.0398	-0.0291	-0.0012
28	0.003	-0.0064	-0.0325	-0.01	-0.0307	-0.0377	-0.0424	-0.0427	-0.0299	-0.0363	-0.0313	-0.0047
29	0.011	-0.0067	-0.0374	-0.0086	-0.0323	-0.0395	-0.0455	-0.0471	-0.0338	-0.031	-0.0377	-0.0063
30	0.008	-0.0064	-0.0326	-0.0135	-0.0298	-0.0394	-0.0456	-0.0478	-0.0363	-0.0278	-0.0388	-0.0073
31	0.016	-0.008	-0.0275	-0.0145	-0.0282	-0.0377	-0.0443	-0.0462	-0.0358	-0.0261	-0.04	-0.0125
32	0.031	-0.0076	-0.039	-0.014	-0.0272	-0.0373	-0.0444	-0.0466	-0.0347	-0.0234	-0.0393	-0.0139
33	0.038	-0.0069	-0.0407	-0.0095	-0.0259	-0.0366	-0.0436	-0.0465	-0.0344	-0.0235	-0.038	-0.0099
34	0.024	-0.0082	-0.0259	-0.0067	-0.0274	-0.0344	-0.0434	-0.0475	-0.0386	-0.027	-0.0439	-0.0161
35	0.018	-0.0096	-0.0284	-0.0061	-0.0287	-0.0348	-0.0454	-0.0496	-0.0414	-0.0316	-0.0396	-0.0204
36	0.048	-0.0071	-0.0293	-0.0065	-0.028	-0.0325	-0.0424	-0.0455	-0.0393	-0.032	-0.0236	0.0061

Exhibit 6

From:	Moore, David (ECY)
To:	Knight, David T. (ECY ERO); Bellatty, James (ECY); Laurie, Tom (ECY);
cc:	Lavigne, Ronald (ATG); Ross, James D. (ECY); Braley, Susan (ECY); Mann. Laurie@epamail.epa.gov;
Subject:	Use of phosphorus target for the Spokane River DO TMDL
Date:	Friday, April 03, 2009 7:56:51 AM
Attachments:	Setting Phosphorus Targets in the Lake Spokane TMDL.docx

Good morning,
Attached is a short (2+ pg) write-up describing the dual assessment point approach including our reasons and support for using a riverine assessment point target concentration for phosphorus in Lake Spokane. The intent of this write-up is to provide common understanding amongst Ecology staff and for stakeholders that express concern or confusion with this approach. Many thanks to Susan and Jim R. for pulling this together. Let me know if you have any questions or comments.

Dave

(509) 329-3514

Setting Phosphorus Targets in the Spokane TMDL
to meet Dissolved Oxygen Criteria
4/1/09

Background

Following the request from EPA for Ecology to postpone submittal of the 2008 draft TMDL, an interagency workgroup comprised of IDEQ, Ecology, EPA, and the Spokane Tribe of Indians collaborated through the latter part of 2008 into 2009 to develop a revised list of modeling scenarios for the TMDL. A key change in the TMDL direction was an agreement between agencies and stakeholders that Avista be considered in the TMDL for their contributions to dissolved oxygen levels in Lake Spokane. Therefore, the goals of this modeling effort are to develop a scenario or set of scenarios that will allow the TMDL to:

- Distinguish the dissolved oxygen impacts caused by Long Lake Dam from impacts caused by excess nutrients from the upstream Dischargers and
- Determine the cumulative impact on dissolved oxygen in Lake Spokane by upstream Dischargers.

In order to meet these goals, it became clear that a different modeling approach and new set of scenarios are necessary to assign a quantitative value for a dissolved oxygen impact caused by Long Lake Dam. The new TMDL scenarios will rely on a two step process to determine allocations, involving two assessment points in Lake Spokane:

1. The first step involves setting an assessment point in the riverine portion of Lake Spokane. A modeling scenario will then use pre-determined total phosphorus wasteload allocations for upstream Dischargers and tributary nonpoint load allocations designed to meet this riverine assessment point.

2. Modeled results from the first step will then be used to analyze dissolved oxygen in the lake, using a second assessment point that is based on an average of the lake conditions.

This will provide the framework for a "dual assessment point" concept: riverine nutrient allocations and dissolved oxygen targets in the lake. The dual assessment point concept is a significant change from past modeling, which did not try to differentiate the effects on dissolved oxygen caused by point source dischargers from the effects caused by Long Lake Dam. Modeling results using the dual assessment point concept will allow the TMDL to determine discharger wasteload allocations, tributary load allocations, and Avista's dissolved oxygen requirement.

What Steps and Assumptions make up this dual assessment concept?

1. Set a target total phosphorus concentration for the riverine portion.

   After technical analysis and review of data, a total phosphorus concentration of 10 µg/L was chosen for the riverine model assessment target. This target represents an approximate 60% reduction from the current water quality standard concentration of 25 µg/L in Lake Spokane, which was shown not to be protective of water quality

(Cusimano, 2004). The following section of the Washington State water quality standards apply when the existing phosphorus concentrations are not protective of water quality:

> WAC 173-201A-230
> 3 (b) Determine appropriate total phosphorus concentrations or other nutrient criteria to protect characteristic lake uses. If the existing total phosphorus concentration is protective of characteristic lake uses, then set criteria at existing total phosphorus concentration. If the existing total phosphorus concentration is not protective of the existing characteristic lake uses, then set criteria at a protective concentration.

In the WAC, 10 µg/L is the phosphorus concentration that delineates between oligotrophic and lower mesotrophic.

Using Carlson's (1996) trophic state index, the existing standard of 25 µg/L TP was on the mesotrophic / eutrophic line, while our new target of 10 µg/L gives an index of 37, which is on the oligotrophic / mesotrophic line. The goal of the TMDL is to push Lake Spokane toward an Oligotrophic state as opposed to a continuation of the eutrophication that existed with the 25 µg/L TP standard.

Further, this target is recommended in EPA's *Ambient Water Quality Criteria Recommendations* for rivers and streams in ecoregion II. Therefore, Ecology believes this is a reasonable target to base the modeling on.

This target concentration provides the foundation from which the load allocations can be validated for the riverine portion of the Spokane TMDL. The target will be used as part of the basis for the model in order to determine whether the wasteload allocations chosen in subsequent modeling steps meet the defined riverine phosphorus target. The overall focus on meeting dissolved oxygen criteria by reducing point and nonpoint sources of phosphorus remains unchanged from previous drafts of the TMDL.

2. Set tributary total phosphorus nonpoint source load allocations for Hangman, Little Spokane, and Coulee Creeks. The allocations will be expressed as percentage reductions based on 2001 concentrations.

3. Set the Discharger phosphorus wasteload allocations based on two TMDL scenarios:

   - Scenario #1: 50 µg/L for all sources except Kaiser (35 µg/L)
   - Scenario #2: 35 µg/L for all Washington sources except Inland Empire and Idaho sources (all remain at 50 µg/L)

4. Set the Discharger CBOD and Ammonia allocations based on previously modeled values.

5. Run CE-QUAL-W2 model and output total phosphorus, dissolved oxygen, and ammonia at riverine assessment point. Determine if 10 µg/L phosphorus target is met.

6. If target is met at riverine assessment point from March through September, analyze the reservoir dissolved oxygen output. If target is not met, the interagency modeling team will consider lowering the wasteload allocation inputs to the model.

7. Determine Avista dissolved oxygen requirement by taking the difference in reservoir dissolved oxygen between TMDL scenario #1 and the No Source scenario minus 0.2 mg/L (this requirement will be expressed as a bi-weekly average dissolved oxygen improvement).

EPA Support for the Dual Assessment Methodology

Ecology has consulted with EPA to ensure that this methodology is supported by EPA and will lead to TMDL approval. EPA agrees that this is a reasonable method for quantifying Avista's contrition to the dissolved oxygen in Lake Spokane, in relation to contributions of nutrients from the Dischargers. EPA notes that setting up assessment points to be used for modeling purposes is different from a compliance point designed to determine compliance with the water quality standards. Therefore, riverine and lake targets set as assessment points in the TMDL are not necessarily representative of water quality standards.

References

Carlson, R.E. and J. Simpson. 1996. *A Coordinator's Guide to Volunteer Lake Monitoring Methods.* North American Lake Management Society. 96 pp.

Cusimano, B. 2004. *Spokane River and Lake Spokane (Long Lake) Pollutant Loading Asssessment for Protecting Dissolved Oxygen.* Publication no. 04-03-006. Washington State Department of Ecology, Environmental Assessment Program. Olympia, Washington.

Exhibit 7

From: Marti Bridges
To: Robert Steed;
Subject: RE: pollutant trading on Spokane
Date: Friday, August 14, 2009 11:55:20 AM

Sorry I missed you call, Bob. We were meeting with Barry about the Spokane River situation regarding the TP listing, pollutant trading, and the misuse of EPA eco-regional recommendations by regional offices.

Under 054.04 High Priority Waters it states "Until a TMDL or equivalent process is completed for a high water quality limited water body, new or increased discharge of pollutants which have caused the water quality limited listing may be allowed if interim changes, such as pollutant trading, or some other approach for the pollutant(s) of concern are implemented and the total load remains constant or decreases within the watershed."

The Spokane River in Idaho is listed for TP and is high priority based on the Five Year Review Schedule/Integrated Report. The three existing dischargers are not new, nor as I understand it, increasing their discharge per se. So a pollutant offset as we have used them down here, would not appear to apply. (That is one of the "some other approach for the pollutant(s). Brian Nickel brought this up in discussion with me, too, as I had mentioned the concept, and he reminded me of our own statute as I did not realize the river had been listed for TP.

Pollutant offsets are typically offered up front in order to get a permit as well as the 401 cert. We used an offset approach for the City of Kuna to the Lower Boise as a new discharger because the Lower Boise is listed for TP and is high priority, plus the SR-HC TMDL dictates that the Lower Boise must meet a TP target of .07 mg/L at Parma. For EPA permit writers to buy into accepting our offset provision their needs to be reasonable assurance. There can be a problem with us invoking this statute because it is problematic due to the Pinto Creek case that says you can't have a new discharge or expanded discharge without a WLA in an approved TMDL. Brian Nickel did the permit for Kuna.

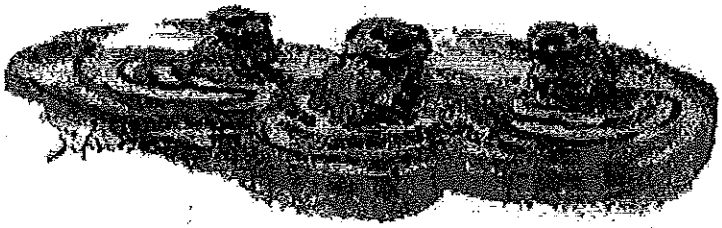
Spokane River in Idaho remains a question mark since there is no data to support the listing for TP, and no data to support a delisting, either. Hope this helps.

We've met with Barry and we will be identifying the costs associated with developing a pollutant trading framework specific to the Spokane in Idaho for the three dischargers. We have requests for trading frameworks in the North Fork Payette above Cascade, and for TSS in the Mid Snake. Once that's fleshed out we'll know more. Too bad this is 303(d) listed.

So I have a question regarding CDA RO writing a 4b plan for this based on the permits—what do you know about that?.

Oh and just so you are aware, we will not be using EPA eco-regional criteria recommendation for any TMDL work, or any assessments of /beneficial use support (if it's been used that way). More on that later. Barry pounced on that one.

Ms.Marti L. Bridges
Marti.Bridges@deq.idaho.gov **
TMDL Program Manager
Idaho Dept. of Environmental Quality
208-373-0382
208-373-0576 fax



From: Robert Steed
Sent: Friday, August 14, 2009 11:40 AM
To: Marti Bridges
Subject: RE: pollutant trading on Spokane

Marti, I tried calling you but you weren't there. Please provide a citation or reference to the code you refer to in the statement "Also, we can't use pollutant offsets for the Spokane because these are existing dischargers who must reduce. That falls under rule in Idaho Code…" Thanks

Bob-

From: Nickel.Brian@epamail.epa.gov
To: John Tindall; June Bergquist;
Subject: Fw: pollutant trading on Spokane
Date: Wednesday, August 12, 2009 9:14:34 AM

FYI.

----- Forwarded by Brian Nickel/R10/USEPA/US on 08/12/2009 09:13 AM -----

<Marti.Bridges@deq.idaho.gov> To Brian Nickel/R10/USEPA/US@EPA

cc

08/12/2009 08:51 AM Subject pollutant trading on Spokane

Hi Brian: I understand you have been talking with June Berquist about pollutant trading in the context of the Idaho permittees.
We should probably have a chat. I am the point person on trading for DEQ, and have been working with your other permit writers, along with David Domingo, Claire Schary, Dave Croxton and Mike Lidgard. Unfortunately, no one from the CDA office or EPA has brought me in on trading discussions for the Spokane. There are many hurdles I can see to trading currently. First and foremost is while some perceive a market exists, I don't think on the Idaho side there is anything tradable. In other words, until someone has reduced sufficiently to generate "credits" they wouldn't able to trade. Also, we trade in the context of EPA approved TMDLs. There is no EPA approved TMDL for the Spokane yet, unless I've missed something.

Give me a call at your leisure. I'm in much of this week, but in the field all next week.

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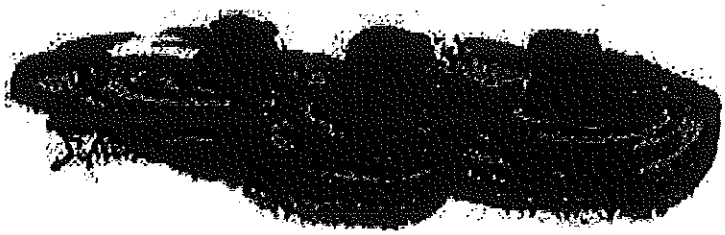

From: Marti Bridges
To: Robert Steed;
Subject: RE: pollutant trading on Spokane
Date: Friday, August 14, 2009 11:55:20 AM

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TMDL Program Manager
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From: Robert Steed
Sent: Friday, August 14, 2009 11:40 AM
To: Marti Bridges
Subject: RE: pollutant trading on Spokane

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Bob-

<Marti.Bridges@deq.Idaho.gov>

To Brian Nickel/R10/USEPA/US@EPA

cc

08/12/2009 08:51 AM

Subject pollutant trading on Spokane

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We should probably have a chat. I am the point person on trading for DEQ, and have been working with your other permit writers, along with David Domingo, Claire Schary, Dave Croxton and Mike Lidgard. Unfortunately, no one from the CDA office or EPA has brought me in on trading discussions for the Spokane. There are many hurdles I can see to trading currently. First and foremost is while some perceive a market exists, I don't think on the Idaho side there is anything tradable. In other words, until someone has reduced sufficiently to generate "credits" they wouldn't able to trade. Also, we trade in the context of EPA approved TMDLs. There is no EPA approved TMDL for the Spokane yet, unless I've missed something.

Give me a call at your leisure. I'm in much of this week, but in the field all next week.

Ms.Marti L. Bridges
Marti.Bridges@deq.Idaho.gov **
TMDL Program Manager
Idaho Dept. of Environmental Quality
208-373-0382
208-373-0576 fax

Exhibit 8

From: Mann.Laurie@epamail.epa.gov
To: Moore, David (ECY);
Subject: draft stateline language
Date: Wednesday, July 29, 2009 1:02:54 PM
Attachments: DRAFT Stateline Language for TMDL 0622.doc

Dave,
I had a great phone conversation with Helen B today, including a lengthy discussion about allocations to Idaho - - too hard to summarize in an e-mail. But I will say that I'm very glad she's looking at the document now!

She sent me her comments on the document - - and I've just started looking at what you've written. In my first skim through the document, however, I didn't see the draft stateline language. I'm attaching it - - although I do realize it's possible that you've included a variation of this language already (and I will find it when I read it through).

thanks,
Laurie

Laurie Mann 206.553.1583
U.S. Environmental Protection Agency
Environmental Engineer
TMDL Program
1200 Sixth Avenue, Suite 900, OWW-134
Seattle, WA 98101-3140
http://www.epa.gov/r10earth/tmdl.htm

From: Braley, Susan (ECY)
To: Moore, David (ECY);
Subject: RE: Avista tour
Date: Friday, July 31, 2009 3:45:44 PM

Hey Dave! Back trying to clear out my emails. Hey, just heard Helen in conversation with Meghan from Avista and it was good....Helen was upfront about not having all the answers but encouraging that Avista is being proactive and wanting to do the right thing. It also sounds like they are equally frustrated with EPA, so they could be good allies in the long run.

Well let's see...we started at the Satellite and then Lucy and Chris had to leave cause their babysitter called....so those of us left went next door to Irvs? (the Gay bar) where there was some show going on...pretty funny since the guys were not very comfortable...I just thought it was hysterically funny. Next time you see Don ask him what he thought about the "show girls" and whether he got hit on. So next time I am in Spokaloo we will have another night on the town and give a little more notice...it was pretty impromptu. Don said he talked to Lucy next day and they already have a game plan to hit some really good sleazy dance joints. I just need to find a good excuse to get over there!

Hope you have a great weekend--Susan

From: Moore, David (ECY)
Sent: Thursday, July 30, 2009 9:43 AM
To: Braley, Susan (ECY)
Subject: Avista tour

Hi Susan,
Got your voice message and I'm glad you had a chance to talk with Meghan. I told her, as you did, that she should talk with Todd about receiving credits for nonpoint source reductions in the context of a TMDL load allocation that must be met first. I'm encouraged that they are approaching the problem that way and I hope there's some light in the tunnel for them in order to make improvements in the tributaries that supply a big load of phosphorus into Lake Spokane. Sorry I missed your going out party and I wonder if you made it to the Viking.

Dave

(insert after WLA section in TMDL)

Loading from Sources in Idaho

Basis for Quantifying the Idaho Sources

Ecology lacks the authority to establish wasteload allocations for sources outside the State of Washington. Therefore, this TMDL does not include specific load or wasteload allocations for Idaho sources. In order to consider the cumulative impact of all discharges on the water quality in Lake Spokane, however, this TMDL does make assumptions about the levels of oxygen demanding pollution that will cross into Washington from Idaho.

Washington's water quality criterion for dissolved oxygen in lakes (WAC 173-201A-200(1)(d)(ii)) requires that "human actions *considered cumulatively* may not decrease the dissolved oxygen concentration more than 0.2 mg/L below natural conditions." (emphasis added). Idaho point source discharges alone can currently cause more than 0.2 mg/L of dissolved oxygen depletion in Lake Spokane (Cope 2006). Point source oxygen demanding pollution from both Idaho and Washington must therefore be significantly reduced in order to ensure compliance with the dissolved oxygen criterion in Lake Spokane.

Very specific assumptions about the reductions of anthropogenic loading of phosphorus, CBOD, and ammonia from point sources in Idaho have been incorporated into the model scenarios supporting this TMDL. The results of these model scenarios indicate that the anthropogenic loading of phosphorus, CBOD and ammonia from Idaho must be reduced so that the impact of those pollutants, when analyzed separately from the effects of pollutants discharged in Washington and improvements required of Avista, decreases the dissolved oxygen in Long Lake by no more than **[insert DO mg/L]**. These reductions in anthropogenic loading from Idaho are needed in order to ensure that the dissolved oxygen water quality criteria are attained in Lake Spokane on a cumulative basis.

(Include this paragraph if the Idaho "allocation" is >0.1 mg/L: It is important to note that this TMDL also requires water quality improvements of Avista in Lake Spokane, which increase the total loading capacity for oxygen-demanding pollution (see section). Without such improvements, the total dissolved oxygen sag caused by both Idaho and Washington pollution sources would be 0.9 mg/L. Thus, the dissolved sag attributable to Idaho pollution sources comprises X% of the total oxygen demanding pollution loading as quantified by the total, unmitigated dissolved oxygen sag.

The specific March – October seasonal average pollutant reductions needed in Idaho to achieve an **[insert DO mg/L]** decrease in Lake Spokane are outlined in Appendix X. These reductions consider the water quality impacts of specific point sources of pollution in Idaho: Coeur d'Alene WWTP, Hayden WWTP, City of Post Falls WWTP, and stormwater discharges authorized by the Phase II MS4 permits in Coeur d'Alene and Post Falls.

Appendix X

Idaho Wastewater Treatment Plants

The loading from the Idaho wastewater treatment plants was quantified and simulated in the model as described below. These figures are model input values, not wasteload allocations.

Similar to Washington's wastewater treatment plants, modeling scenarios simulated projected year 2027 effluent flow rates for each of the Idaho treatment plants and March – October seasonal average effluent concentrations of phosphorus, CBOD and ammonia. The simulated pollutant concentrations represent substantial reductions from currently permitted levels and are similar to the simulated pollutant concentrations for Washington wastewater treatment plants.

The concentrations simulated for Coeur d'Alene and Post Falls are identical. Since the Hayden Area Regional Sewer Board (HARSB) currently does not discharge to the Spokane River year-round, but may need to discharge to the river year-round in the future, two discharge alternatives are presented for HARSB. Alternative #1 is based on year-round discharge and uses concentrations identical to those simulated for Post Falls and Coeur d'Alene, and alternative #2 is based on seasonal discharge (i.e. little or no discharge during July, August and September but increased discharge of phosphorus at other times). The cumulative effect of effluent limitations based on either HARSB discharge alternative would assure attainment of water quality standards in Lake Spokane. The simulated loads for Idaho wastewater treatment plants are presented in Table Y.

The simulated loads for Idaho point sources are calculated from the simulated concentrations and flows as follows:

Seasonal Average Load (lb/day) =
2027 Eff. Flow (mgal/d) × Seasonal Avg. Conc. in Table Y (ppm) × 8.3454 lb/gal

Table Y: Loading from Idaho Wastewater Treatment Plants

Point Source Discharge	Projected Year 2027 Flow Rates used to determine loads (mgd)	March - October Seasonal Average Simulated Loads (lb/day)					
		NH3		TP		$CBOD_{ult}$	
		ppm	lb/day	ppm	lb/day	ppm	lb/day
City of Coeur d'Alene WWTP	7.6	0.71	45	0.036	2.3	16.1	1020
HARSB WWTP Alternative #1	3.2	0.71	19	0.036	0.96	16.1	430
HARSB WWTP Alternative #2				Note 2			
City of Post Falls WWTP	5.0	0.71	30	0.036	1.5	16.1	671
Total for WWTPs	**15.8**	**N/A**	**94**	**N/A**	**4.8**	**N/A**	**2121**

Notes:
1. NPDES permit limits will use $CBOD_5$ rather than $CBOD_{ult}$.
2. HARSB Alternative #2 TP Concentrations and Loads:
   March, April, May, June and October: 0.107 ppm and 2.9 lb/day
   July, August and September: 0.007 ppm and 0.2 lb/day
3. This is the total for HARSB Alternative #1. The total load for HARSB Alternative #2 is 6.7 lb/day for March, April, May, June and October and 4.0 lb/day for July, August and September.

Storm Water

The model scenarios also simulated the anthropogenic loading of phosphorus, ammonia, and CBOD discharged to the Spokane River from storm water sources in Idaho, as described below. These loadings are model input values, not wasteload allocations.

Similar to Washington storm water sources, the calculation of loading from Idaho storm water sources used the simple method described on Page X. The loading of these pollutant parameters simulated in the model, for Idaho sources, is shown in Table Z.

Table Z: Loading from Idaho Storm Water Sources

Sources	Estimated Flow Rate (mgd)	March - October Seasonal Average Simulated Load (lb/day)					
		NH3		TP		$CBOD_{ult}$	
		ppm	lb/day	ppm	lb/day	ppm	lb/day
MS4s for the City of Coeur d'Alene and the City of Post Falls	0.93	0.05	0.38	0.31	2.4	13.6	105

Total Simulated Load from Idaho Point Sources

The total loading of phosphorus, ammonia, and CBOD simulated in the model for Idaho wastewater treatment plants and storm water sources is shown in Table AA, below. The

model predicts that this amount of loading from Idaho point sources (as distinct from sources in Washington and improvements required of Avista) decreases the dissolved oxygen concentration in Lake Spokane by 0.XX mg/L, which decreases the remaining loading capacity available for Washington point, non-point, and background sources by that amount.

Table AA: Total Loading from Idaho Point Sources

Source Category	March - October Seasonal Average Simulated Load (lb/day) [1]		
	TN lb/day	TP lb/day	$CBOD_5$ lb/day
WWTPs	94	4.8[1]	2121
Storm Water	0.4	2.4	105
Total	**94.4**	**7.2**[1]	**2226**

Notes:
1. This is the total for HARSB Alternative #1. For HARSB Alternative #2, the total phosphorus load simulated is 9.1 lb/day for March, April, May, June and October and 6.4 lb/day for July, August and September.

Idaho Non-Point Sources

For Idaho non-point sources, including groundwater, the model scenarios simulate the same flow rates and phosphorus, CBOD, and ammonia concentrations that were measured in 2001. The model's upstream boundary at Lake Coeur d'Alene is assumed to be a natural background condition (see Page X and appropriate technical report(s)). Surface water tributary flows to the Spokane River in Idaho are negligible and thus have not been quantified in the model (Annear, Wells, and Berger 2005). Therefore, no reductions from 2001 levels of non-point oxygen-demanding pollution in Idaho are necessary in order to ensure compliance with Washington water quality standards.

NPDES Permits for Idaho Point Sources

NPDES regulations require permit conditions which ensure compliance with the water quality standards of all affected States (40 CFR 122.4(d)). Previous modeling efforts have shown that discharges of phosphorus, ammonia, and CBOD from point sources in Idaho affect water quality in Lake Spokane (Cope 2006). Therefore, EPA, as the NPDES permitting authority for Idaho, must establish effluent limitations in permits for Idaho point sources which ensure that the total dissolved oxygen decrease in Lake Spokane attributable to the Idaho point sources does not exceed 0.XX mg/L. If the Idaho NPDES permits are conditioned such that the total loadings of phosphorus, ammonia, and CBOD from point sources in Idaho does not exceed the levels simulated in the model (Tables Y, Z, and AA), the permits will ensure compliance with Washington water quality standards. Similar to Washington sources, Ecology expects EPA to control the discharge of phosphorus, ammonia and CBOD using best management practices (BMPs) in the municipal stormwater permits.

The figures presented in Table Y represent one combination of phosphorus, CBOD, and ammonia loads discharged by Idaho wastewater treatment plants which, considered cumulatively with other point and non-point sources in both States and improvements

required of Avista, would ensure compliance with water quality standards in Lake Spokane. However, effluent limits for Idaho wastewater treatment plants need not be identical to the levels presented in Table Y. For example, the proportion of the total loads of phosphorus, CBOD and ammonia "allocated" to individual Idaho WWTPs in their respective NPDES permits may be different from that presented in Table Y, as long as the total seasonal average loads of those constituents are less than or equal to that shown in Table Y. EPA may also consider facility-specific effluent variability in calculating average monthly and average weekly effluent limits, as required by 40 CFR 122.45(d)(2). Furthermore, the total loadings of phosphorus, ammonia, and CBOD discharged in Idaho could be different than those presented in Table AA, as long as the cumulative dissolved oxygen sag does not exceed 0.XX mg/L. Since all three constituents contribute to dissolved oxygen depletion, any increase in a given constituent would require compensating reductions in other constituents.

Exhibit 9

From: Robert Steed
To: John Tindall; "bryce.sandy@epa.gov";
cc: Robert Steed;
Subject: FW: Spokane River: Northern Rockies or Columbia Plateau? 2nd Opinion
Date: Monday, April 13, 2009 4:56:42 PM
Attachments: spokaneriver.jpg
image002.png

John,

The information I have sent you (see email below) may need to be further discussed. I have been in contact with Ms. Sandy Bryce, and have learned much. Sandy works for Dynamac Corporation for the Western Ecology Division of U.S. EPA in Corvallis. Sandy is an author of many of the country's ecoregion maps, and a developer of the ecoregion maps for our area. Sandy told me several things that bolster DEQ's challenge to the appropriateness of 10 ug/L TP target for an assessment point somewhere between Nine Mile dam and Long Lake Reservoir (the inundated portion of the Spokane River). EPA's total phosphorus criteria recommendations are based on Aggregate Nutrient Ecoregion III. Sandy's ecoregion delineations have been aggregated to form Nutrient Ecoregions.

Below I reference the ecoregion "type" areas. The concept of ecoregion "type" areas is not applicable to the current ecoregion maps. Making comparison with what is in the center of an ecoregion may not necessarily be a correct method for determining which ecoregion an area belongs to. I keyed in on the over-story pines, assuming that pines were a characteristic for the Northern Rockies ecoregion. The Columbia plateau has other examples of areas with pines, especially where ground water is available.

Sandy stated that, "It is a toss up whether the nine mile area shown below is in ecoregion 10 (Columbia plateau) or 15 (northern Rockies)". Columbia plateau is part of Xeric West aggregate nutrient ecoregion and northern Rockies is part of Western Forested Mountains aggregate nutrient ecoregion. When delineating ecoregions, developers avoid contacts that run along waters, like the contact does along the east half of Long Lake Reservoir. If I understood her correctly, it appears that our assessment point (nine mile area) is part of the Four Mound Prairie, which is within the Columbia plateau ecoregion.

Clearly the basis for 10 ug/L TP in this section of river isn't as simple as it has been portrayed. The presence of a map line itself is not appropriate justification for the application of numeric criteria for protection of beneficial uses. DEQ should stick with our position that the assessment point is on the contact between ecoregions and the assessment concentration should also be between the suggested values for each aggregate nutrient ecoregion.

On another element of this issue; I am still questioning that appropriateness of the Western Mountains aggregate nutrient ecoregion results because:

1. It is my understanding that most (99%+) nutrients in the data base were analyzed following EPA method 365.4. EPA method 365.4 has and applicable range (MDL) between 0.01 and 20 mg/L TP. Labs do provide low level TP analysis, but the quality of these low level analyses is less than can be ascertained following the method. When I send samples to the lab sometimes the results to not meet data quality objectives. The best I can get our lab to perform at for low level nutrient analysis is precision DQO of 20% and accuracy DQO of ± 25% recovery. That means there is a 95% chance when I look at a lab report that says TP = 9.9 the value is somewhere between 7.4 and 12.4. How can criteria be developed from data that are likely to be inaccurate? It's not a sliding scale because the method is actually changed (different stuff is used) when running low level TP.
2. The criteria are said to be based on 25th percentiles of Aggregate Nutrient Ecoregion II Reference Conditions, but I believe they are actually the 75th percentile of the Aggregate Nutrient II Conditions. I can not find the documentation that "Reference" waters were identified for the Western Mountains.
3. The table from executive summary shows the Range of Level III Subecoregions Reference Conditions, especially the lower limit are greater than the individual ecoregions. How can an aggregate have a range smaller than a subset of the ecoregion?
4. Table 3h. Reference conditions for level III ecoregion 15, which is the Northern Rockies, shows TP (along with other parameters) ranging from 0 to 760. How can TP = 0 with the analysis methods available to us. The method detection limit is 10 ug/L. How were BDL handled? Zero's in a data base make me wonder. Do you suppose zeros are used for BDL? Or do zeros represent "no data". Was the 25th or 75th percentile calculated with zeros in the data base?

I have contacted the folks that developed these guidance documents, but have not gotten what I need yet.

I have included Sandy on this e-mail. Sandy, any correction, or clarification would greatly be appreciated.

Bob-

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From: Robert Steed
Sent: Monday, March 30, 2009 4:34 PM
To: John Tindall
Cc: Robert Steed
Subject: FW: Spokane River: Northern Rockies or Columbia Plateau?

It is not always that simple. Boundaries between two ecoregions (contacts) are not always that clear and for that reason it is important to be familiar with the area. I suggest, from my memory of Long Lake Reservoir area, satellite imagery, and photos; that the Long Lake Reservoir area is more like Northern Rockies type areas, and less like Columbia Plateau type areas. Classification using Northern Rockies Ecoregion is probably correct, but poorly justified. In my opinion, on border contacts, it isn't appropriate just to default to the map. Application of EPA Ambient Water Quality Criteria Recommendations to contacts between ecoregions may not make sense. It is likely that WQ targets should be somewhere between Northern Rockies and Columbia Plateau.

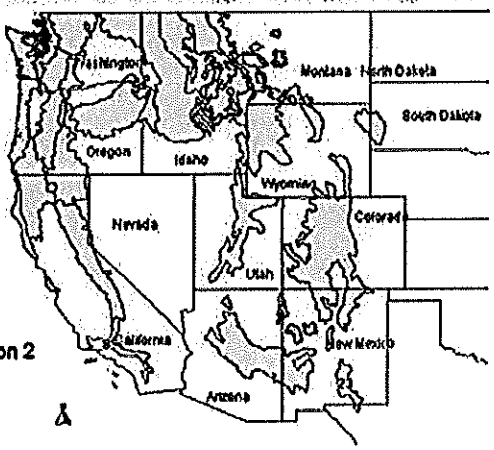
Let's run an analogy between your front yard and back yard. When you are standing in the front yard, "which yard you are in" is obvious. From your front yard you can see the front of your house, you can see the driveway to the garage, and you can see the street and the front of the neighbor's house across the street. On the other hand,

when you are in the back yard you can see the back of your house, the back of your neighbor's house, and dog toys. These descriptive "yard" characteristics are similar to the characteristics used to describe ecoregions. Ecoregion descriptions usually characterize a typical (type) location representing the rest of the Ecoregion. Areas along the contact between ecoregions commonly display characteristics of both adjoining ecoregions. Back to the yard, as you walk from the front of the house to the back, you'll get to an area where you can see both the front of the neighbor's house across the street and the back of the neighbor's house out back. Further toward the back you get to a location where you can no longer see the driveway, even further you may get into the dog poop zone. The contact between the front yard and back yard may be at different locations depending on what criteria you use to define each. You know there is a line (contact) between the front yard and the back yard, but the actual location becomes subjective.

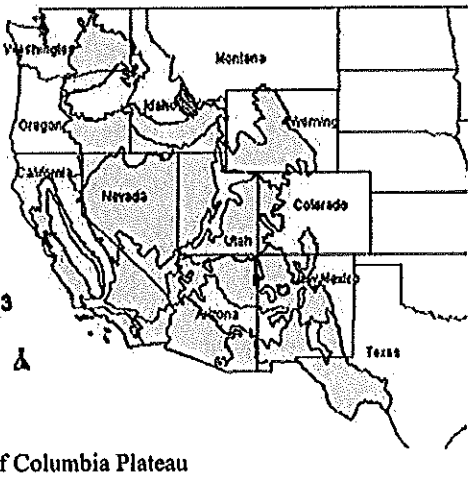
Back to the Spokane River. The lake is bisected by the contact between the "Columbia Plateau" and the "Northern Rockies" Aggregate Nutrient Ecoregions 3.

Aggregate Nutrient Ecoregion III	Streams – 25%tile of Reference Conditions	Streams – Range of Reference Conditions
Columbia Plateau	21.88 ug/L	10-55 ug/L
Northern Rockies	10.0 ug/L	3.0-32.5 ug/L

EPA's Technical Guidance Manual for Developing Nutrient Criteria for Rivers and Streams describes two ways of establishing a reference condition. One method is to choose the upper 25th percentile (75th percentile) of a reference population of streams. This is the preferred method to establish a reference condition. The 75th percentile was chosen by EPA since it is likely associated with minimally impacted conditions, will be protective of designated uses, and provides management flexibility. When reference streams are not identified, the second method is to determine the lower 25th percentile of the population of all streams within a region. The 25th percentile of the entire population was chosen by EPA to represent a surrogate for an actual reference population. Data analyses to date indicate that the lower 25th percentile from an entire population roughly approximates the 75th percentile for a reference population (see case studies for Minnesota lakes in the Lakes and Reservoirs



Aggregate Nutrient Ecoregion 2

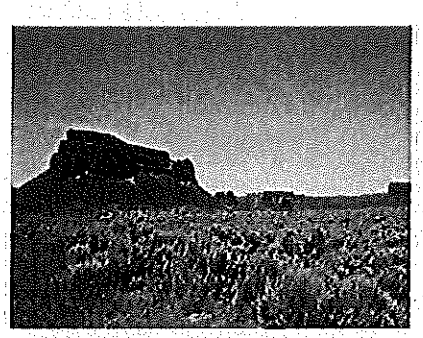


Aggregate Nutrient Ecoregion 3

Descriptive Characteristics of Columbia Plateau

The Columbia Plateau is an arid sagebrush steppe and grassland surrounded on all sides by moisture, predominantly forested, mountainous ecological regions. This region is underlain by lava rock up to two miles thick and is covered in some places by loess soils that have been extensively cultivated for wheat, particularly in

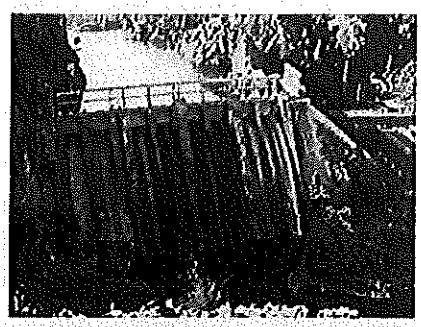
the eastern portions of the region where precipitation amounts are greater.




Descriptive Characteristics of Northern Rockies

The Northern Rockies is an ecoregion of high, rugged mountains. Although alpine characteristics, including numerous glacial lakes, are found in the higher elevations, the region is not as high nor as snow and ice covered as the Canadian Rockies. The mosaic of vegetation that presently and originally covered the region is different than that of the Middle Rockies. Although Douglas fir, subalpine fir, Englemann spruce, and ponderosa pine are characteristic of both regions, western white pine, western red cedar, and grand fir were and are common in the Northern Rockies, but not the Middle Rockies. Mining activities have caused stream water quality problems in portions of the region.


Lake Spokane Reservoir
The following pictures are from Lake Spokane Reservoir.

Caveat from EPA's Ambient Water Quality Criteria Recommendations: The values presented in this document generally represent nutrient levels that protect against the adverse effects of nutrient over enrichment and are based on information available to the Agency at the time of this publication. However, States and Tribes should critically evaluate this information in light of the specific designated uses that need to be protected. For example, more sensitive uses may require more stringent values as criteria to ensure adequate protection. On the other hand, overly stringent levels of protection against the adverse effects of cultural eutrophication may actually fall below levels that represent the natural load of nutrients for certain waterbodies. In cases such as these, the level of nutrients specified may not be sufficient to support a productive fishery. In the criteria derivation process, it is important to distinguish between the natural load associated with a specific waterbody and current reference conditions, using historical data and expert judgment. These elements of the nutrient criteria derivation process are best addressed by States and Tribes with access to information and local expertise. Therefore, EPA strongly encourages States and Tribes to use the information contained in this document and to develop more refined criteria according to the methods described in EPA's technical guidance manuals for specific waterbody types.

Bob-

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From: Nickel.Brian@epamail.epa.gov [mailto:Nickel.Brian@epamail.epa.gov]
Sent: Friday, March 27, 2009 12:24 PM
To: JROS461@ECY.WA.GOV
Cc: DMOO461@ECY.WA.GOV; Cope.Ben@epamail.epa.gov; Mann.Laurie@epamail.epa.gov; John Tindall; Robert Steed
Subject: Spokane River: Northern Rockies or Columbia Plateau?

Hi Jim,

At the meeting, some of the stakeholders were suggesting that the Spokane River is actually in the Columbia Plateau nutrient ecoregion. During the first go-around on this project, I asked our nutrient coordinator (at the time, it was Ralph Vaga) which ecoregion the Spokane River was in. He sent me the attached map. According to that map, the Spokane River is in the Northern Rockies ecoregion, which is part of the larger Western Forested Mountains ecoregion, except for the lower part of Lake Spokane, which is apparently in the Columbia Plateau ecoregion.

The recommended phosphorus value for the Western Forested Mountains aggregate ecoregion is 10 ppb (EPA 822-B-00-015, Page 19).
http://www.epa.gov/waterscience/criteria/nutrient/ecoregions/rivers/rivers_2.pdf

Thanks,

Brian Nickel, E.I.T.

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