Comments Regarding "Spokane River Location Ratios" by Portland State University and Washington Department of Ecology dated June, 2012

By: HDR, Inc. *for* Spokane County Utilities Date: July 16, 2012

1. The proposed method relies on the framework of the CE-QUAL-W2 model of the Spokane River yet does not use the model for determining the location ratios for a phosphorus trading framework. This is not consistent with the approach used to establish the TMDL and constituent equivalency for NPDES permits. The proposed method does not take advantage of the capabilities of the water quality model. The water quality model may well be the best available tool to determine the magnitude of change in dissolved oxygen at the compliance point to changes in phosphorus along the river.

   The purpose of location ratios is to account for dynamics occurring in the river. "*Delivery or location ratios are calculated as part of the overall trading ratio for a particular pair of sources to account for pollutant attenuation because of the fate and transport characteristics of a pollutant, the unique characteristics of the watershed (e.g., hydrology, vegetation), distance, and time"* (EPA, 2009). CE-QUAL-W2 is a fate and transport model and is the tool to account for pollutant attenuation. There is a lengthy paragraph in the introduction about the qualities and benefits of the model.

2. The water quality model may be the best available tool to be used to simulate the impact on dissolved oxygen to total phosphorus loads at different locations. Using the water quality modeling tool developed of the Spokane River is the most direct approach to determine if the location of phosphorus loads result in different changes in dissolved oxygen at the compliance point. This could be accomplished with various approaches including:
   a. The total baseline phosphorus load could be moved to each branch for a scenario simulation and the difference in dissolved oxygen for the baseline and branch load could be compared. The differences could then be normalized to determine the location ratios.
   b. An equal additional phosphorus load could be added to each branch for a scenario simulation and the difference in dissolved oxygen for the baseline and branch load could be compared. The differences could then be normalized to determine the location ratios.
3. The water quality model may be the best available tool to account for the impact to dissolved oxygen, which is the parameter of concern in the Spokane River. Accounting only for total phosphorus loads as proposed ignores the fate issue which is required by EPA and Ecology. It assumes all phosphorus arriving downstream is equivalent when PO4-P is likely to have a different impact on dissolved oxygen than phosphorus in organic matter. This assumption does not match with the basis of the TMDL or Ecology guidance which states that, "*ratios adjust for the environmental impact of a pollutant discharge being moved from one part of a watershed to*

another, changes in pollutant form, and uncertainty" (Ecology, 2010). The best characterization of loading equivalency through location ratios would be related to the environmental impact, in this case dissolved oxygen concentrations, and not simply a load accounting.

4. Using the model would account for the upstream total phosphorus load which is not included in the accounting in the proposed Method.
5. Using the model would allow the development of location ratios for Idaho if an Idaho or a Bi-State trading program is developed. This approach provides flexibility to expand the trading area.
6. Using the model would allow this method to be applied to determine location ratios for other parameters or equivalency between parameters (TP, CBOD, NH3N).
7. Using the model would provide for consistency with previous decisions and allow for a basis for revisions to the TMDL, NPDES permits, and/or trading program in the future if inconsistencies are discovered, such as the setting of WLAs or permit limits.
8. The location ratios should be established at specific points and not for branches.
    a. Branches are arbitrary modeling divisions that do not correlate to the watershed. Specific identifiable locations are understood by the regulated community and relate to specific discharges. Even the introduction states "*A total phosphorus (TP) point to point source discharge trading scheme may be proposed"(PSU, 2012).* Thus, the location ratios should be point to point.
9. Explain why a computer program is needed and what it will provide. "*Phosphorus gains and losses will be calculated with a computer program that reads model input and output files"* (PSU, 2012). What output files and output information will be used?
10. Explain the need for specialized output when no model simulations are proposed. "*CE-QUAL-W2 will also be programmed to create a specialized output file that contains model predicted total phosphorus losses due to groundwater outflows"* (PSU, 2012).
11. It is unclear if accounting for total phosphorus is in all forms, or only Ortho-phosphate (PO4-P).
12. The purpose for the detailed accounting in Table 3 is unclear?
13. The proposed method for determining the location ratios does not demonstrate through water quality modeling that the reductions will benefit conditions at the compliance point.

References

Ecology, 2010. Draft Trading Framework Paper for Review and Comment.

EPA, 2009. Water Quality Trading Toolkit for Permit Writers. Office of Wastewater Management. EPA 833-R-07-004.

PSU, 2012. Spokane River Location Ratios. Portland State University and Washington Department of Ecology.

By: JUB Engineering *for* City of Post Falls Date: July 16, 2012

From: Paul Klatt [mailto:pklatt@jub.com]
Sent: Monday, July 16, 2012 5:46 PM
To: Ken Windram (ken@harsb.org); Michael Neher
Cc: Terry Werner; Jim Kimball
Subject: PSU Spokane River Location Ratios Report

Ken, I believe that you asked for me to comment on this report from PSU but perhaps it was Mike.

Nevertheless, my comments are less important than Dave Dilks'. Hopefully, he is on this with Sid and/or Spokane County. If not, he should be in order to keep PSU and WDOE on the right track with this model.

This is strictly a conceptual model in the report (setup only and no actual ratios presented). It only goes from the WA/ID border to Long Lake, so no trading model is being evaluated in Idaho (in case you are helping fund this effort). The effort should extend from Lake CDA to the Long Lake Dam, just like all the model work and TMDL efforts to date. Attenuation should be understood and modeled along the entire reach in question.

The concept does not show the Little Spokane River as an input of TP. I understand that the hatchery contributes quite a bit and the Little Spokane was always included previously.

That is really the extent of what I see, just in case it comes up at this weeks' DO TMDL or SRSP meetings.

Paul