LimnoTech
Water | Environment | Scientists | Engineers

DATE: April 6, 2011

MEMORANDUM

FROM: David Dilks, Joseph Helfand

PROJECT: PFHARSB

TO: Gary Allen

CC: Michael Neher, Ken Windram, Paul Klatt, Terry Werner, Eric Keck

SUBJECT: **DRAFT: Documentation of Alternate Idaho Point Source Scenario Considering Additional Phosphorus Removal in February**

Summary

Post Falls and HARSB are investigating alternate NPDES permit limits that will comply with the Lake Spokane TMDL. LimnoTech conducted a CE-QUAL-W2 simulation using effluent limits previously proposed by Idaho dischargers, modified to extend advanced phosphorus removal into the month of February for point sources in Idaho and Washington. Results of this model simulation indicate compliance with all three draft tests for "Compliance with Washington Water Quality Standards" as proposed by EPA.

Background

U.S. EPA and Washington Department of Ecology (Ecology, 2010) developed a Total Maximum Daily Load for nutrients and oxygen demanding materials designed to minimize the anthropogenic affects on dissolved oxygen in Lake Spokane. Because Ecology has no permitting authority in Idaho, the TMDL allows consideration of alternate NPDES permits for Idaho point source dischargers, as long as they result in dissolved oxygen concentrations in Long Lake that are compliant with Washington Water Quality Standards. Ecology is now examining alternate effluent scenarios for Washington discharges, requiring less stringent treatment but extending the period of additional treatment into February. Post Falls and HARSB desire a determination of whether this new treatment scenario for Washington discharges, combined with previously requested effluent limits for Idaho point sources, will result in compliance with the TMDL.

On October 27, 2010, EPA issued for discussion purposes a draft test for "Compliance with Washington Water Quality Standards", which would allow the results of a given CE-QUAL-W2 simulation to be assessed in terms of whether its results were consistent with the TMDL. This draft test for compliance had three criteria, all of which must be met:

1. The alternate scenario must not increase the spatial or temporal extent of Avista responsibilities, after results are rounded to 0.1 mg/l.
2. The alternate scenario must not decrease the dissolved oxygen concentration averaged across all Avista-affected segments and times.
3. The alternate scenario must not increase Avista's responsibility in any segment or time, after results are rounded to 0.1 mg/l.

These compliance criteria have not been finalized, and are used here for illustrative comparison purposes only.

The purpose of this memorandum is to document the new scenario being simulated in CE-QUAL-W2 and present its results. The memorandum is divided into sections discussing:

- Scenario Under Evaluation
- Interpretation of Results

Scenario under Evaluation

This section describes the specific scenario being evaluated. Effluent concentrations for Post Falls and HARSB were based on the concentrations that they requested during the TMDL Dispute Resolution process, with the primary changes being that more rigorous treatment begins in February. Concentrations specified to the model are shown in Table 1. Effluent concentrations for Coeur d'Alene vary over time and are shown in Table 2. Model inputs for all Washington dischargers for these new model runs were kept at the same levels and timeframes as in the final TMDL, except for total phosphorus. For the Washington dischargers, rigorous phosphorus treatment was initiated in February instead of March, and municipal dischargers were given a WLA of 50 ug/L. Inland Empire Paper was given a WLA of 70 ug/L.

Table 1.

February – October Pollutant Concentrations for HARSB and Post Falls

	TP (ug/l)		**Ammonia (mg/l)**		**CBOD5 (mg/l)**	
	WLA	Permit	WLA	Permit	WLA	Permit
HARSB	50	70	2.9	4.0	2.9	4.0
Post Falls (desired conc.)*	50	70	4.0	5.6	4.0	5.6
Post Falls (model input)*	76.5	-	6.1	-	6.1	-

* Post Falls concentrations were entered into the model at 1.53x specified concentrations to reflect increase in discharge flow to 7.65 MGD, compared to 5 MGD assumed in TMDL.

Table 2.
Pollutant Concentrations for Coeur d'Alene for Periods of Rigorous Treatment

	Feb. – Oct. TP (ug/l)		**Mar.-Oct. Ammonia (mg/l)**		**Feb.-Mar. CBOD5 (mg/l)**		**Apr. – Oct. CBOD5 (mg/l)**	
	WLA	WLA	WLA	Permit	WLA	Permit	WLA	Permit
Coeur d'Alene	50	70	4.29	6	3.56	5	3.2	4.5

Interpretation of Model Results

The results of the new scenario comply with all three draft tests for "Compliance with Washington Water Quality Standards" as proposed by EPA:

1. It does not increase the spatial or temporal extent of Avista responsibilities, after results are rounded to 0.1 mg/l.

2. It results in a 0.01 mg/l increase (relative to the TMDL) in predicted dissolved oxygen when averaged over all segments and times of Avista responsibility.
3. It does not increase Avista's responsibility in any segment or time, after results are rounded to 0.1 mg/l.

References

Washington Department of Ecology, 2010. Spokane River and Lake Spokane Dissolved Oxygen Total Maximum Daily Load, Water Quality Improvement Report. Publication No. 07-10-073. Revised February 2010.