Comment Matrix for Pend Oreille River Temperature TMDL Pre-Public Draft				
Helen Rueda, EPA 1/22/08 version 5				
Index	**X-ref**	**Commenter**	**Comment**	**Draft Response**
AC1		Corps of Engineers	Level of Uncertainty: there is potential for significant uncertainty in the model accurately predicting temperatures in the Pend Oreille River. A quantitative analysis of model uncertainty should be conducted and applied to assessments of compliance. A sensitivity analysis should be performed to evaluate the detection tolerance of the model. Clear justification, along with confidence limits assumed, should be used for using a 0.3 °C detection tolerance. A sensitivity analysis should also be performed to determine the impacts of the simulation of pre-dam parameters on model results.	
AC2		Corps of Engineers	Level of Uncertainty: It is unreasonable to state that model error and uncertainty is not important when comparing two model scenarios.	
AC3		Corps of Engineers	Level of Uncertainty: the location of the upstream boundary condition excludes the interaction of Lake Pend Oreille and the Clark Fork River with flow into the Pend Oreille River. ACOE suggests that PDO River model should be coupled together with a Lake PDO model to provide greater accuracy at the boundary condition.	
AC3b		Corps of Engineers	The prediction errors of model estimates of temperature at a specific point in time and space can be much larger than prediction errors of simulated temperatures averaged over time and space. ACOE conducted an analysis quantifying the prediction errors of daily maximum surface temperatures, daily maximum depth-integrated temperatures, and daily average depth integrated temperatures in the Pend Oreille River at Riley Creek during June 21 - september 21, 2004. The prediction errors of model estimates of surface temperatures were much larger than errors of simulated daily average depth-integrated temperatures and daily maximum depth-integrated temperatures.	
AC4a	SL4	Corps of Engineers	Travel Time and Lag Time: Differences in travel times are not accounted for and should be evaluated.	Ecology is performing preliminary analyses to evaluate the temperatures using frequency distributions that minimize the effect of lag time. It appears that the impairments identified do not change, and if supported by additional analysis, we will report that and stick with the original approach. Biological significance of lag time can be addressed during implementation or 401 certification. Ecology will share our initial findings at the Jan. 30 WAG meeting.
AC4b	SL4	Corps of Engineers	Travel Time and Lag Time: differences in water quality metrics between the two model scenarios does not account for the source or significance of these differences. The model shows a differential transport of thermal loads external to the Pend Oreille River, and the temperature differences have nothing to do with changes to the thermal loading of the Pend Oreille River by Albeni Falls Dam. The differences in temperature have been inappropriately designated as non-compliance events caused by Albeni Falls Dam.	
AC4c	SL4	Corps of Engineers	Travel and lag time and importance of distinguishing source of heat load: ACOE ran a simulation excluding the influence of heat exhange processes for 2004 and 2005 where the total amount of thermal energy was conserved. The time history of temperatures at Albeni Falls Dam simply lagged the response at the upstream boundary by the travel time between these two locations. This comparison of conservative transport of external thermal sources resulted in long periods of time where the existing conditions are warmer than natural conditions by over 0.3 °C and warmer than the applicable numeric criteria of 19 °C for daily average conditions.	

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Helen Rueda, EPA 1/22/08 version 5				
Index	**X-ref**	**Commenter**	**Comment**	**Draft Response**
AC4d	SL4	Corps of Engineers	Travel and lag time and importance of distinguishing source of heat load: ACOE ran simulations with, and without the influence of heat exhange between the Pend Oreille River and the atmosphere to provide a means of estimating the internal thermal loading during transport. A series of time history simulations were ran on calculated daily average volume-weighted temperatures of existing and natural conditions with and without heat exchange at Albeni Falls Dam. In general, the change in temperatures for existing and natural conditions ranged from 0.1 to 0.3 °C, which falls below the detection threshold of the model.	
AC4e	SL4	Corps of Engineers	Travel and Lag Time: ACOE ran a simulation comparing daily average volume-weighted temperatures lagged by the difference in travel time to provide a means of estimating the change in temperature of a parcel of water entering the river at the same time for both natural and existing scenarios. A total of eight days in the period of June 21 - September 21, 2004 where the existing temperature is warmer than 19 °C and is warmer than natural conditions by at least 0.3°C. This is about 9 percent of the total days in the critical time period, which falls below the threshold identified as a thermal impairment in Appendix D of the WBAG II. It should be noted that external sources of temperature contribute to many of these daily average termperature differences.	
AC5		Corps of Engineers	Hydrologic Budget, correct open gate in existing condition scenario (1) and re-run	
AC6		Corps of Engineers	Hydrologic Budget, re-calibrate	
AC7		Corps of Engineers	Lake Pend Oreille Elevation: natural conditions scenario (8) are too low during the summer and all year. Use the ACOE-developed lake elevation rating curve, which is based on USGS data, to run a sensitivity analysis on the "natural" scenario model runs using their rating curves.	
AC8		Corps of Engineers	Use of surface and bottom cells for compliance is not representative of water quality conditions in the Pend Oreille River. Simulations have generated physically unrealistic temperatures near the channel bottom. Surface cells represent extreme conditions that are highly influenced by atmospheric and tributary inputs, and they do not represent the dominant aquatic habitat in the Pend Oreille River. ACOE recommends using volume-weighted or flow-weighted temperatures, which are more reqresentative of the water quality of the dominant aquatic habitat.	
AC9	PP4	Corps of Engineers	Use of instantaneous metric comparing two model scenarios for compliance does not accurately reflect meaningful changes to the thermal loading of the Pend Oreille River and it makes no distinction between sources of pollution within or outside the river reach of interest. The use of daily maximum and daily average temperatures are a more accurate and comprehensive metric for assessment of compliance. The 7-day average of the daily maximum is a better assessment of compliance when comparing scenarios with different travel times using CE QUAL.	In addition to the answer above (PP3), Ecology's standard is a one day maximum of 20 oC. TMDLs model the worse case scenario to ensure that water quality standards will be met under a variety of conditions, thereby building in a margin of safety into the TMDL.

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Helen Rueda, EPA 1/22/08 version 5				
Index	**X-ref**	**Commenter**	**Comment**	**Draft Response**
AC10a		Corps of Engineers	IDEQ has conducted considerable research on temperature regulation and published documents how temperature compliance should be addressed for Idaho rivers. ACOE sees little evidence this has been followed, nor have they seen the current method used in previous temperature TMDLs in Idaho.	
AC10b		Corps of Engineers	A more rigorous statistical analysis of the data on frequency, magnitude and duration of violations, a comparison of the frequency and duration of temperatures over 22 °C for both model scenarios, and 95th percentiles. ACOE developed their own frequency analysis to quantify thermal conditions between the two scenarios using a frequency of exceedance of the volume weighted daily average termperatures.	
AC11		Corps of Engineers	Idaho DEQ's publication, "Temperature Frequency of Exceedance Calculation Procedure" states if frquency of exceedance is less than 10%, and there is no other evidence of thermal impairment, then it is possible to move for delisting than proceed with a temperature TMDL. A sfrequency analysis of the data should be performed to better quantify temperature exceedances outlined in the TMDL.	
AC12		Corps of Engineers	Idaho DEQ's publication, "Application of the Idaho Water Quality Standards Temperature Exemption" states that the numeric temperature criteria is exempt when air temperature exceeds the 90th percentile of the annual maximum weekly maximum temperatures as determined from the historical record of a nearby weather station. During 2004, air temperatures exceeded the 90th percentile at Sandpoint and Priest River several times in July and August. The TMDL needs to explain this exemption and how it may or may not be used in the pend Oreille River TMDL.	
AC13		Corps of Engineers	The Draft TMDL is lacking technical data that justifies how compliance metrics were determined in Idaho.	
AC14		Corps of Engineers	The Draft TMDL is lacking technical data that justifies how water quality standards compliance was decided upon in Idaho.	
AC15		Corps of Engineers	TMDL should present statistics, figures and tables of the data used by Idaho DEQ for making compliance determinations.	
AC16a	PN1, PP6	Corps of Engineers	In addition to recognition of deterimental changes to the thermal regime, the positive thermal impacts of Albeni Falls Dam on the Pend Oreille River to the aquatic environment should be discussed in the TMDL through a comprehensive risk assessment of beneficial uses in the Pend Oreille River.	Ecology does recognize that in some locations and at some times of the year, the temperature may be lower due to the dams. However, TMDLs on focus on times when standards are not met, and do not allow credits when standards are met. Washington's standards are set to protect beneficial uses based on the best available information. However, any entity can conduct a biological assessment as an implementation strategy and submit the results to Ecology for consideration.
AC16b	PN1, PP6	Corps of Engineers	Formal recognition of the enhancements to the thermal regime of the Pend Oreille River by Albeni Falls Dam should be considered in the form of thermal credits as allowed under the Pollution Trading statues of Idaho State regulations.	
AC17		Corps of Engineers	Loading Analysis, the loading allocations as estimated by equation 1 page 71 has been improperly applied. The spatial and temporal designation of water temperature and discharge parameters needs to be consistently identified. If the discharge used in equation 1 reflects a depth integrated estimate, the corresponding temperature also should correspond to a depth integrated estimate	

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Helen Rueda, EPA 1/22/08 version 5				
Index	**X-ref**	**Commenter**	**Comment**	**Draft Response**
AC18		Corps of Engineers	Use of inconsistent boundary conditions at the upstream boundary of the model for different scenarios	
AC 19		Corps of Engineers	Washington state line target on May 1, 2004. Differences between Washington's natural and existing conditions scenarios were the result of comparing different boundary conditions. When determining WA state line targets upstream model simulated boundary conditions should be used for both the existing and natural simulations.	
AC20		Corps of Engineers	TMDL Analyses – The methodology applied has not clearly identified the source of the perceived thermal impairment. External sources of heat are the primary determinant of temperatures in the Pend Oreille River because of the short residence time in this reach (2-12 days). It is inappropriate to associate the existence and operation of Albeni Falls Dam as the source for these external thermal loads.	
PN1	AC16, PP6	Ponderay Newsprint	Albeni Falls Dam causes cooler conditions in the river for the majority of the time	Ecology does recognize that in some locations and at some times of the year, the temperature may be lower due to the dams. However, the TMDL will focus on and apply to sites that do not meet water quality standards.
PN2		Ponderay Newsprint	Use of t=34(/T+9) equation in WAC 173-201A-602(2); T = background, not natural temperature; equation applies to point sources not dams; should use WAC 173-201A-200(1)(c)(iii)	We agree. Ecology will use WAC 173-201A-200(1) (c) (i), which is the natural conditions + 0.3 deg C. A critical period will be selected based on temperatures rising above 20 deg C.
PN3, PP1	PP1	Ponderay Newsprint, Pend Oreille PUD	Table 23 p. 81 use of 20 degrees C as Allowable temperature - use of numeric criteria when natural conditions should apply	Ecology will correct and clarify this table.
PP2		Pend Oreille PUD	Use of inconsistent boundary conditions at the upstream boundary of the model for the existing and the natural conditions scenarios	Upstream boundary conditions for the scenarios using existing Idaho conditions will be modified to use Idaho model outputs instead of observed conditions.
PP3	SL3	Pend Oreille PUD	Use of Surface Cells for Compliance, volume weighted average of entire water column should be used to assess compliance	Ecology standards are not set up to allow for volume weighted averaging. TMDLs must take into account worse case scenarios, so Ecology will not use volume weighted averaging. The model does average horizontally and vertically within each cell. Averaging throughout the water column could be less representative of the temperatures in the river.
PP4	AC9	Pend Oreille PUD	Use of maximum temperature on maximum day for compliance	In addition to the answer above (PP3), Ecology's standard is a one day maximum of 20 oC. TMDLs model the worse case scenario to ensure that water quality standards will be met under a variety of conditions, thereby building in a margin of safety into the TMDL.
PP5	SL7	Pend Oreille PUD	Upstream state should set allocations to meet downstream state standards	We agree. We will ensure that the requirement and IDEQ"s efforts to meet WA water quality standards at the border is clarified in the next draft.
PP6	AC16, PN1	Pend Oreille PUD	Most of the time, in the summer season, Box Canyon causes lower than natural temperature conditions in the river	Ecology does recognize that in some locations and at some times of the year, the water temperature may be lower due to Box Canyon Dam. However, the TMDL will focus on and apply to sites that do not meet water quality standards.
CS1		City of Sandpoint	Allocations need to be set to accommodate anticipated future growth	
SW1		Southside Water and Sewer	Allocations need to be set to accommodate anticipated future growth	
SW2		Southside Water and Sewer	Most of the time, in the summer season, Albeni Fall causes lower than natural temperature conditions in the river - this should stated in the report	

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Helen Rueda, EPA 1/22/08 version 5				
Index	**X-ref**	**Commenter**	**Comment**	**Draft Response**
SW3		Southside Water and Sewer	Table 15 (p. 71) has inconsistencies; referenced tables and figures do not correspond to reaches; suggest adding "results" and "result date" columns	
SW4		Southside Water and Sewer	Upstream state should set allocations to meet downstream state standards	
SL1		Seattle City Light	Heat Flux model assumes constant flow based on an instantaneous flow at moment of peak temperature; Recommend either summation of 24 hour heat load or daily average of flow and temperature.	Heat loads are required by EPA. However, allocations will consist of both loads and temperture. Implementation activities will be based on temperature.
SL2		Seattle City Light	Heat load calculations should take into account cumulative impacts of upstream actions; downstream sources should not be required to compensate for upstream sources loading	We agree. Downstream sources should not be held responsible for heating passed through from upstream. Heat load calculations and load allocations are based on the impact a particular source (wastewater treatment plant or dam) has. The model scenarios run were used to compare what the temperature would be with and without a certain source; the difference was used to set the allocations.
SL3	PP3	Seattle City Light	Volume weighted temperatures should be used; Data credibility act; significant vertical temperature gradient at Boundary Reservoir	See response to PP3. Ecology is in compliance with the Data Credibility Act because our data was gathered using the appropriate quality assurance procedures which were documented in an approved Quality Assurance Plan. Ecology took efforts to ensure that the data collected was representative of the location in the water column.
SL4	AC4	Seattle City Light	Analysis should account for temperature increases resulting from lag time. Other commenter's share this concern. Lag time is a ½ day to 1 ½ day time period. We could use an approach that has been used elsewhere with our existing data and models. SCL is currently working on this with Ecology staff.	Ecology is performing preliminary analyses to evaluate the temperatures using frequency distributions that minimize the effect of lag time on model error. It appears that the impairments identified do not change, and if supported by additional analysis, we will report that and stick with the original approach. Biological significance of lag time can be addressed during implementation or 401 certification. Ecology will share our initial findings at the Jan. 30 WAG meeting.
SL5		Seattle City Light	Acknowledge absence of modeling of Seven Mile Reach	Additional analysis will try to separate upstream and downstream effects. A downstream temperature effect from flow regimes may actually exist. Additional monitoring and analysis could be specified during implementation. The 401 Certification may also address this issue.
SL6		Seattle City Light	Water Quality Standards and Allowable temperatures should be consistent; should explain more clearly and in detail how these allowable temperatures were derived	Agreed. Ecology will revisit and clarify where needed.
SL7	PP5	Seattle City Light	The TMDL should require Idaho compliance with downstream standards at the state border; even if Idaho is non-compliant at the border, Washington and Kalispel sources should not be required to compensate.	We agree. We will ensure that the requirement and IDEQ"s efforts to meet WA water quality standards at the border is clarified in the next draft.
SL8		Seattle City Light	The TMDL includes unreasonable shade enhancement obligations. Load allocations for mainstem vegetation should be re-visited.	Ecology will clarify the shade relationship with mainstem temperature. However, shade enhancement could help with near-shore temperatures and be considered as mitigation as part of implementation. Shade allocations will be based on potential natural vegetation to be consistent with other temperature TMDLs.
SL9		Seattle City Light	The implementation plan should include specific information about state, EPA and tribal processes so that requirements are clear to regulated entities.	A new implementation strategy will be written for the next draft.
SL10		Seattle City Light	Provide explanations on which modeling scenarios were used to determine load allocations	Agreed. Ecology will clarify in the next version.

Comment Matrix for Pend Oreille River Temperature TMDL Pre-Public Draft				
Helen Rueda, EPA 1/22/08 version 5				
Index	**X-ref**	**Commenter**	**Comment**	**Draft Response**
SL11		Seattle City Light	Use of single point maximum temperatures is given as a margin of safety in TMDL	When implementation actions are taken to achieve compliance with the maximum temperature on the worst day, then temperatures resulting from an unexpected event are likely to meet the water quality standard, thus providing a margin of safety.
SL12		Seattle City Light	Single point modeling in Washington is inconsistent with the approach being taken in Idaho	The modeling approach between IDEQ and Ecology is consistent. On two IDEQ compliance points, volume weighted average was used to assess compliance with Idaho's standards. Load allocations were developed for the Idaho sites that exceeded standards. Ecology determined the load allocations consistent with our standards and our approach to develop TMDLs, which is to address the worst case scenario. Ecology's standard does not allow a volume weighted average.
SL13		Seattle City Light	Washington and Idaho must use same target dates to ensure consistency; May1 vs. August 25	The May dates were due to a modeling inconsistency which has been addressed. The dates are now in better agreement, but may be slightly different due to differences in conditions in different parts of the river.
SL14		Seattle City Light	Provide context for colmpliance assessment	This section in the TMDL is a required by IDEQ and not Ecology. IDEQ used specific areas to evaluate whether the water temperatures were in compliance with their water quality standards. Those sites not in compliance then undergo further analysis to develop load allocations. Ecology does not use specific points, rather we evaluate reaches of the river to determine where our standards are being met and where load allocations are required. Ecology will clarify where and when the temperature impairments are in the next draft.
SL15		Seattle City Light	Explain 2 degree exceedance above allowable conditions in Figure 21 Aug 25 - 20 river miles	Ecology will provide a better explanation of Figure 21 in the next draft.
SL16		Seattle City Light	Table 31 lists Seattle City Light as responsible for monitoring in "Stimson Lumber Temperature and Sediment .." This is incorrect	Ecology will correct this mistake.
SL17		Seattle City Light	p.69 paragraph 4 references 2003 & 2004 data - this should be 2004 and 2005 data	Ecology will clarify this in the next draft.
SL18		Seattle City Light	Figures 25 and 26 - Y axis label "temperature impairment" is misleading	Ecology will better explain, and possibly revise Figures 25 & 26 in the next draft.