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**Meeting date:** February 24, 2004

**Location:** Salem Library – Anderson Auditorium, Salem, Oregon

**Prepared by:** EnviroIssues  
(Contact: Hadley Greene, hgreene@enviroissues.com)

**Attendees:** *Council members present:* Greg Aldrich, Dave Cruickshank, Bill Dameworth, Steve Downs, Douglas Hunt, Chris Jarmer, Ernie Platt, Laurie Power, Mark Simmons, Mark Steele, Rod Thompson, Kathryn VanNatta, Mark Yeager

*Council members not present:* Nina Bell, Jim Kincaid, Doug Krahmer, Jerry Marguth, Matthew Rea, Glen Spain, Travis Williams

*Others:* Pat Serie, facilitator, Hadley Greene, EnviroIssues; Dennis Ades, Sonja Bjorn-Hansen, DEQ; Charles Logue, Clean Water Services; Marv Lewallen and Stacey Lee, Weyerhaeuser; Andrew Swanson, Clackamas County Water Environment Services; Pam Barrow, Northwest Food Processors Association; Peter Ruffier, Tom Mendes, City of Eugene; Dave Kliewer, City of Portland; Stewart Rounds, USGS; Arthur Armour, USACE

**Welcome and Introductions; Comments to the Council**

Pat Serie, EnviroIssues, welcomed the group and outlined the agenda.

Serie asked the public for comments. Marv Lewallen, Weyerhaeuser, asked for permission to comment to the Council after the lunch break.

**Understanding the New Temperature Standard – How it Applies to the Willamette River; What the Modeling Tells Us**

Dennis Ades, DEQ, described the revised temperature standard recently adopted by Oregon’s Environmental Quality Commission. At this meeting, DEQ plans to show how these standards will be applied. The numeric criteria in the new standards are similar in many ways to earlier criteria. The standards require consideration of the location and timing of beneficial uses such as salmonid spawning and rearing. Biological-based criteria are specific to these life stages and are used for screening temperature data. They determine whether a stream is identified as water quality impaired. Such streams are placed on the 303d list.

Temporal model result plots, provided to the Council as handouts, represent the seven-day average of daily maximum temperatures over time at various locations in the basin. Each temporal plot in the handout corresponds to a specific river mile. The charts were used to indicate that when the natural thermal potential (also known as system potential) exceeds the biological-based criterion, the natural condition becomes the applicable numeric criterion. The natural thermal potential also is the basis for TMDL development and heat load allocations.

## Issues/Concerns

- Do the daily maximum temperature and criteria plots correspond to 303(d) listing segments, are they segments DEQ has picked, or are they segments generated for the model? *DEQ has provided model output for various locations in the vicinity of major NPDES permitted facilities. The 303(d) listing segments have not been modeled separately.*
- Vegetation that is along the river now is not necessarily the same as natural conditions. *If a certain area has room for improvement, then the natural thermal potential is based on meeting that target. DEQ has tried to incorporate natural disturbance into the development of potential vegetation and effective shade targets.*
- Is natural thermal potential the same as system potential on this graph? *Yes. Natural thermal potential is the language included in the new temperature rule. The two terms are for practical purposes the same.*
- There seems to be hardly any difference between the calibrated model output and the calibrated system potential lines. Is the small difference flow related? *There is a small difference between what is observed and what is simulated in the model. Flow is important to temperature, but in the 2002 mainstem simulations it is essentially the same as the current scenario and the system potential one scenario during the middle of summer (early July through late August).*
- Is the temperature target date sensitive? *Yes, and, to some extent, flow sensitive.*
- Will facilities have to change their inputs to the river based on date? *Point sources will need to make sure that cumulatively they are not exceeding the allowable temperature increase. NOTE: One scenario is to develop seasonal waste load allocations based on the most critical period. Another scenario may be flow based and provide greater flexibility, but greater monitoring and reporting requirements.*
- The Corps has never achieved the biological opinion flow, is that correct? *The Corps has come pretty close to biological opinion flows.*
- Before we decide whether to use the minimum or maximum temperatures for the system potential, it is important to understand whether the impairment is due to anthropogenic causes. Has DEQ made a final decision to use the minimum temperature? *DEQ will assess to see what is consistent with the permitting approach.*
- An important issue is the peaks and valleys on the average daily maximum temperature graph and the algorithms used in the model. What do they mean, and what does the bottom of the sine pattern represent? *A deeper explanation would be appreciated. Briefly, the temporal variations in daily and seven day maximum temperatures at any one location during midsummer are attributed to changes in climatic conditions and solar loading to the system. This pattern is apparent in both the current condition as well as the system potential simulation that has anthropogenic sources of heat removed. Stream flows in the mainstem are relatively constant during this period. From another perspective, sine wave patterns*

*appear when seven day maximum temperatures for a single day are displayed in a longitudinal manner over tens of miles. Water generally warms in a downstream manner, but weekly climatic conditions, daily warming and cooling patterns and river velocity influence where maximum temperatures are observed on a daily basis. Parcels of warm water move through the river system as warm sunny periods are expressed as greater seven-day maximum temperatures sequentially from boundary locations downstream towards Salem.*

- *What is the impairment caused by anthropogenic additions of heat to the water? It is the distance between the red (current condition) and blue line (system potential). The peaks and valleys are highs and lows in the seven-day average of daily maximum temperatures. Water quality, and to some degree beneficial uses such as cold water aquatic life, are considered impaired when ambient water temperatures exceed the applicable numeric criteria.*
- *What is the cause of the differences between the red line and the blue line? For each segment, will DEQ have to determine the differences? The locations where temporal plots were developed are upstream of major point sources. The differences in summer temperatures represent nonpoint source influences and perhaps some point source heat from upstream sources. The lines show that we are close to the natural thermal potential in most locations.*
- *What is the biological basis for protecting the less stressful time period? The biological basis for the numeric criteria is well discussed in the issue papers related to rule development. This information is available on DEQ's web page*
- <http://www.deq.state.or.us/wq/standards/WQStdsTemp.htm>.
- *What is a choice for the daily maximum temperature that does not add another level of conservatism to what we already have? The blue line already incorporates conservative choices about shade. It is difficult to justify making another conservative choice by using the valleys. There is uncertainty about effective shade levels in the model. However, it is also apparent that shade levels are not uniformly higher in the system potential simulation than they are under current conditions. The lack of natural disturbance in some areas results in larger trees than are used in our simulation. As for the allowable increase in natural thermal potential temperatures, we assume we are limited to no more than a 0.3°C increase in seven-day maximum temperatures when temperatures exceed the biological based criteria.*
- *DEQ has a choice about how to translate the model into natural conditions criteria. What is the rationale for that choice? DEQ will clarify the rationale and method at the next meeting. Council members are encouraged to offer their ideas of what should be used besides the valleys.*
- *I am confused about how the chart relates to the pragmatic application of the TMDL, and how it will relate to the permits that a source will get. DEQ will discuss how the standards may be applied to different areas later*

**Status of  
Trading  
Programs in  
Oregon – The  
Tualatin  
Example and  
Other Issues**

*in the meeting.*

Sonja Bjorn-Hansen, DEQ Permitting Program, discussed an example of water quality trading on the Tualatin River and perceptions of trading. The goals of the trading project were to identify and implement a model for trading and to use the results to encourage trading throughout Oregon. Opponents of trading see it as a way for sources to get out of compliance. Proponents see trading as a way to use free-market efficiencies to protect the environment. There is a third way to view trading: it can be a better way to protect the resource.

Oregon's first trading project was in the Tualatin basin, which includes a mix of urban, agricultural and forested riparian areas. Clean Water Services is the primary point source that discharges into the Tualatin. The primary problem in the basin is the degraded riparian areas. Most of the basin is dominated by Himalayan blackberry, which does not do a good job of holding soil in place. Many of the stream banks are unstable. When downcutting happens, the water table drops. The redefined problem became whether point sources can help solve the nonpoint source problem.

The advantages of trading are that point sources can meet their waste load allocations for less money, and the money is spent where it will make the most difference for the stream, such as in restoration. Clean Water Services is interested in trading because flow augmentation and riparian shading cost less than refrigeration technology. On the Tualatin, Clean Water Services has been quite proactive and put together incentive programs for farmers that double the subsidy the federal government was offering.

DEQ will establish compliance in the first five years with respect to planting plans. After that, compliance will be measured by shade density measurements rather than on stream temperature. Global warming is an issue, potentially masking potential benefits. DEQ has learned that if stakeholders understand the benefits of trying to protect a resource, they may accept tradeoffs and uncertainties.

**Issues/Concerns**

- What other stakeholders should be represented on a trading advisory group? *A representative of the general public should be included, as environmental groups were perhaps not representing the public's majority opinion.*
- Did you have a response from small environmental groups such as "Friends of Beaver Creek" and others? *Yes.*
- How did you pick out the tradeoffs, from a permitting point of view? How did DEQ determine how much stream restoration to do? *DEQ has decided on shade density measurements to check compliance. Shade works differently from refrigeration equipment, and takes longer to establish. But, shade provides other benefits to the stream.*
- Do areas that are enhanced with shade vegetation have to be protected by

conservation easements? *No, Clean Water Services just has to ensure that the areas will remain shaded over time. Each case is the responsibility of the landowner. Clean Water Services has to make sure that enough areas remain shaded for them to achieve compliance with their permit.*

- *Does a point source have to pay the whole bill? Point sources are a small part of the problem in the basin, and they are choosing to deal with it through participating in trading. It is cheaper than paying for refrigeration.*
- *Do point sources have the responsibility to find landowners willing to participate? What happens if Clean Water Services falls short in finding landowners? Clean Water Services is responsible for meeting the terms of their permit, and if there aren't enough landowners willing to participate, they will have to achieve compliance a different way. However DEQ has seen that there is a lot of interest from landowners looking for the monetary incentive.*
- *What about using ratepayers' money, as would be the case for a public facility such as the City of Salem? The costs are an order of magnitude less than refrigeration.*
- *It is not fair that the burden is all on Clean Water Services. We have a better regulatory handle on point sources than on other sources. Point sources know they have to do something; this is just a cheaper option.*
- *The state will never require a source to install refrigeration equipment. This would never be supported. For a private business, customers will not be comfortable paying extra money. The TMDL resulted in a waste load allocation for Clean Water Services, and DEQ is required to promulgate that waste load allocation in their permit. Refrigeration did not seem like a good solution, and this made the trading option easier to discuss.*
- *Point sources provide a large percentage of the flow in the Tualatin. Was that part of the negotiations? Yes and no. DEQ can't give credit to dischargers for discharging, however the Tualatin is an effluent dominated stream; if you take the water out, it is a detriment to the river. Clean Water Services wants to be a benefit to the river. They do not want to take their water out of the river.*
- *Has the concept of trading been implemented anywhere else? It has been implemented in various forms in other parts of the country. No one has done a whole program based on temperature, although the Port Westford permit included riparian shading as an option in the future.*
- *How will the shade be protected in the future? Legally, the property owner could remove the shade. Clean Water Services has tried to prevent degradation. Clean Water Services may have to overplant to insure that there is adequate shade.*
- *How does trading fit in with the 1010 plans? The 1010 plans do not require farmers to actively plant. This program allows DEQ to strengthen the requirements of the 1010 plans.*

**Public  
Comment**

Marv Lewallen, Weyerhaeuser, addressed the group. He facilitates environmental compliance for 41 of Weyerhaeuser's facilities. It is important to contrast how a private facility responds to regulations compared to a public facility. The market for some facilities, such as Weyerhaeuser's Springfield plant, has gone down, partly due to a poor economy and competition from Asia. Because of these losses, Weyerhaeuser will not throw money at the water temperature problem, but instead will take a market-driven approach. There is not much money available, which limits what can be done in a business setting.

The Springfield plant discharges into the McKenzie River. Springfield has analyzed the times when the river is exceeding the water quality standard, which happens only 5 percent of the time. Whatever limit is imposed, Weyerhaeuser would like it to reflect seasonal variation and the fact that nature has the biggest impact on temperature. At the last Council meeting 0.1° C was suggested as the allocation. Weyerhaeuser could not survive with that. Weyerhaeuser thinks a reasonable target is 0.25° C, which is still within the parameters of water quality standards.

Stacey [redacted], Assistant Plant Manager at Springfield, spoke to the group about his plant's impact on its community and the State of Oregon. Weyerhaeuser is in a difficult position, and global competition is a large factor. China will soon begin competing with Springfield's market with bigger machines that can produce more linerboard than Springfield. As China does not have the same regulatory framework, this will mean a loss of jobs in Oregon. Weyerhaeuser appreciates the Council's work and is not taking their responsibility to the environment lightly.

**Applying the  
Human Use  
Allowance –  
Revised  
Strawman  
Proposal;  
Screening and  
Permitting  
Issues for  
Willamette  
Facilities**

Dennis Ades, DEQ, discussed the application of the new human use allowance as specified in the new temperature standard. Application of the narrative criteria, when the biological criteria are being met, will protect cold water during the summer and protect spawning waters at other times. Generally, the intent of the temperature rule is to cap summer stream temperature increases from human sources at 0.3° C. Prior to establishment of a TMDL no single point source that discharges into a water quality limited water body may cause the temperature to increase more than 0.3° C at 25% of the stream flow, or at the edge of the temperature mixing zone, whichever was more restrictive. This translates to a 0.075°C increase in the entire receiving stream. After the TMDL, the new rules are less specific but require that point source and nonpoint source impacts cumulatively cannot exceed 0.3° C.

DEQ proposed to divide up the allocations by 1/3 each for point sources, nonpoint sources, and reserve capacity. This scenario would allocate heat loads to each sector that corresponds to a 0.1°C increase in ambient water temperatures above applicable numeric criteria. There are only a few point sources whose currently permitted heat load could not be accommodated within this 0.1°C allocation proposal. Questions posed to the council include whether DEQ should pursue this scenario, or change initial allocations to allocate some of the reserve capacity to

these point sources.

Greg Aldrich, DEQ, reviewed how the human use allocation would work. There are eight point sources on the Willamette River that raise issues within the proposed straw man allocation framework of 1/3 for point source, nonpoint source sectors, and reserve capacity. It is important to clarify what happens when there is more than one point source in a location. If there is one facility within the reach of interest (which is a function of receiving stream and point source characteristics), then it will get all of the 0.1° C allocation for the point source sector. If there are other facilities, causing a cumulative stream temperature impact, then the sector allocation will be divided among them. Facilities with current load limits above that level (0.1°C) will need to tap into the reserve capacity. If the reserve capacity is not granted to them, they will need to constrain operations.

DEQ emphasized that since the standard recently changed, it is not possible to base this process on how TMDLs have been done in the past. This group needs to determine how the TMDL will work for the Willamette River, which will then set a precedent for other rivers.

Ades shared graphs showing cumulative point source effects. The graphs show the response of the river to point source discharges, and indicate that the cumulative impact appears to be downstream of, and not necessarily at, the point of discharge. This gets to the question of where the point of maximum impact is. It is not at the river mile where the outfall is, but is actually farther downstream. DEQ will continue to model the cumulative impacts.

#### **Issues/Concerns**

- Does the ¼ (25%) equate back to the 0.08 referred to earlier? *Yes, if allocated within the 25% stream flow, a source can cause no more than a 0.3° C increase in that quarter of the low flow stream. The effect on the entire river, assuming instant and complete mix, would be no more than a 0.075°C increase which we round to 0.08°C.*
- If the allocation for reserve capacity is for future growth, then you already are covered, and do not need the reserve capacity because all new sources will be distinct and separate from existing point sources. *Without reserve capacity, if a new source comes in, or an existing source wants to expand, then there is no part of the pie left to allocate.*
- It is not the responsibility of the point sources to re-vegetate the Willamette Valley, just because of the impact of the nonpoint sources.
- 0.3° C is not specific to each outfall, correct? *It is the point of maximum cumulative impact.*
- Is the point of maximum impact at the edge of the mixing zone? *Not necessarily. The point of maximum impact is determined by evaluating the far field effects of waste loads with the mainstem model. The point of maximum impact may be well downstream of an individual facility.*
- If DEQ measures a facility at the point of maximum impact, then they are

giving someone a one-dimensional mixing zone, and not giving credit for the whole mixing zone, which negates the benefit of diffusers. *DEQ is trying to measure how much heat a facility is delivering to the system, not how that heat is dispersed through the zone of mixing.*

- How will you calculate the point of maximum impact? It is important to see how it will function in real life. *DEQ uses data collected from individual sources to assess heat loads. These loads are added to the river model to determine where maximum changes in ambient temperature are expressed.*
- Can you explain the numbers on the chart showing critical temperature change at 7Q10 flows? Were the numbers calculated during a critical month? What is the duration of each facility's exceedance? *The exceedance likely varies by month, and differs between facilities. These 7Q10 numbers are derived from data for the last 30 years or so collected at USGS gages. These low flow values are paired with system potential temperature values from the model. River flow and river temperature are generally uncoupled during the relatively steady, low flow period of summer. Heat loads from point sources are a function of design flows and maximum reported effluent temperatures. The change in ambient temperature is a mass balance calculation:*

$$\Delta T_{river} = T_{river} - ((Q_{effl} * Temp_{effl}) + (Q_{river} * T_{river})) / Q_{effl} + Q_{river}$$

*Critical temperatures (the period when maximum stream temperature changes were calculated) depend on all of these factors. For far field, or cumulative effects considerations, heat loads that exceeded initial waste load allocation screens were capped at levels that corresponded in a 0.3°C increase in temperature in 25% of the stream flow or 100% of the stream flow. Both true ?*

- Temperature effects are happening at different times, and these facilities are not at the same segment of the river so it is hard to use a linear example to set policy. *The nonpoint source component may not be the same driver in fall that it is in mid-summer. In summer, point source impacts are somewhat masked by nonpoint source loads.*
- The temperature in the stream will increase as it flows downstream, just from the effect of sunshine and natural conditions. *This is controlled for in our analysis.*
- Why does the temperature decay rapidly around river mile 157? *This could be related to travel time and the temperature change over night. NOTE: We are looking at differences in travel time to control for changes in the sine wave.*
- Is DEQ segmenting the river by temperature changes? *No, that is the impact of individual sources, not the change in temperature.*
- The TMDL is a state framework used to improve water quality. DEQ has to set a water quality target for each 303(d) listing segment, so facilities can get off the 303(d) list. Council members need the where and when of what a facility will need to do to satisfy a court that it will meet the water quality standards so it can get de-listed. *DEQ will come back to the Council with a proposal for how the river segments can be defined. River segments are*

*listed on the 303d list by parameter not facilities. Facilities are not de-listed. We can establish compliance points for each 303(d) segment (e.g. ambient monitoring locations or USGS gages) and assign seven-day maximum temperature natural thermal potential values. This is a slippery slope however, because we also need to protect the coolest 7day average of the daily maximum as much as, if not more than, the warmest.*

- *A single anthropogenic source should not be asked to control heat beyond their actual contribution. Fortunately, that is consistent with the language in the standards.*
- *If DEQ goes forward with 0.3° C allocation, is it reasonable to allocate all of it to one nonpoint source, as we are talking about models that are hard to count on?*
- *It will not work well to split up the 0.1° C among several sources. That is not applicable in the real world.*
- *It is hard to understand how permit writers will take this TMDL and temperature standard and convert it into something that can be measured as a compliance piece that can be implemented. The biggest pieces missing are how to calculate the point of maximum impact and the segmentation question. DEQ needs to determine what is causing the hot spot downstream of some point sources in order to figure out who needs to modify upstream discharges to get rid of the hot spot.*
- *How will DEQ figure out, in a dynamic system, what needs to be changed to get rid of the 0.3° C increase downstream? How will DEQ determine who needs to change? Council members cannot accept the strawman proposal until they understand how the responsibility for fixing hotspots will be assigned. DEQ agrees it is hard to determine what needs to change. DEQ will double check to ensure the point of maximum impact is not inflated by errors in the model; specifically changes in travel time. True point source impacts that exceed 0.3° C could be addressed by one of two methods: 1) equal reductions to all contributors within a day's travel time of the exceedances, or 2) reductions based on contributions to the exceedances.*
- *In the current state of Oregon's economy, the governor has been adamant about growing the economy. Cities need to be able to grow and support the economy, and should not have to ask for the reserve capacity at a later date. It has been DEQ's position that changes in mass load increases occur through the appropriate antidegradation review process. We are interested in providing heat load allocations what will accommodate permitted heat loads, up to design limits, while not exceeding the overall human use allocation provided in our administrative rules.*
- *There is no need for withholding the reserve capacity, because the model is saying that the temperature is still increasing 100's of miles down river.*
- *How will the nonpoint source human use allowance be implemented? How to implement the nonpoint source human use allowance is still up in the air. It can perhaps be implemented through the SB 1010 and Forest Act programs, where applicable. The reserve capacity represents coverage for possible vegetation change, and the fact that cultural uses may preclude re-*

*vegetating or riparian restoration.*

**Identifying  
Remaining  
Issues on  
Temperature  
TMDLs and  
Information  
Needed to  
Resolve Them**

The EPA is on target to approve the new temperature standards by March 2, 2004. DEQ believes the new standards will be the same as those the Oregon Environmental Quality Commission adopted in December 2003. This should end the possibility of shifting standards.

**Brief Update on  
Mercury TMDL  
Status; Next  
Steps and  
Meetings;  
TMDL  
Document  
Development  
Update**

The goal of the next Council meeting is to focus on mercury and to move forward with that TMDL. DEQ wants to clarify points from comments received in the fall. The comments have been incorporated into revised allocations.

At the next meeting, DEQ will provide a temperature update, but may not be able to answer all the Council's questions and do all the modeling before the next meeting. Remaining issues will be covered on April 6<sup>th</sup>.

**Remaining  
Questions/  
Feedback**

Pat Serie asked for any remaining comments or questions. There were none. The meeting was adjourned.

**Upcoming 2004  
Meetings  
Handouts**

- March 15<sup>th</sup> at BLM - Salem
- April 6<sup>th</sup> at BLM - Salem
- Agenda
- Willamette River Temperature TMDL Developments (PowerPoint presentation)
- Application of the Human Use Allowance (PowerPoint presentation)
- Water Quality Trading Experiences in Oregon (PowerPoint presentation)
- 2002 Willamette Basin 7 Day Average of Daily Maximums Temperature Locations