Deschutes River, Capitol Lake, and Budd Inlet
TMDL Advisory Group Meeting

Thursday, February 23, 2012 -- 9:10 a.m. to 12:05 p.m.
Department of Ecology, 300 Desmond Dr. SE, Lacey

Attendees

Citizen
- John DeMeyer

Capitol Lake Improvement and Protection Association (CLIPA)
- Bob Holman

Deschutes Estuary Restoration Team (DERT)
- Dave Peeler

Ecology, WA State Dept. of
- Shawna Beers
- Betsy Dickes
- Linda Kent
- Kim McKee
- Greg Pelletier
- Mindy Roberts
- Lydia Wagner

Enterprise Services (DES), WA Dept. of
- Carrie Martin

Lacey, City of
- Julie Rector

LOTT Clean Water Alliance
- Karla Fowler
- Brian Topolski

Olympia, City of
- Andy Haub
- Laura Keehan

Olympia Yacht Club
- Jim Lengenfelder

Squaxin Island Tribe
- John Konovsky

Thurston County Environmental Health
- Sue Davis

Thurston County Storm & Surface Water Advisory Board
- Pete Heide
- Gary Larson

Thurston Public Utilities District
- Chris Stearns

Transportation, WA State Dept. of (WSDOT)
- Jeff Williams

General Updates

Meeting Notes: The November 2011 and January 2012 notes are not done yet. Lydia will send out a notice when Ecology posts them online.

Draft Revised TMDL Technical Report:
- **Website (ftp) site link**: On January 26, an e-mail went out to everyone who attended any advisory meeting since it convened in 2009. It provided a link to the technical report, appendices, and Response to Comments from the October 2008 review.
- **Talking Points**: On February 13, Ecology sent a follow-up e-mail with a "Project Update" to advisory group representatives to use for briefing their respective organizations. Ecology committed to developing this resource at the January 26 meeting. It is available online at http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/advisorycomm/012612DeschutesAdvMtgTechRptPrjctUpdate022012.pdf.
- **Comment Period**: Ends Monday, February 27, at close of business. E-mail or send hard copy comments directly to Lydia. She will compile and provide them to the Environmental Assessment Program.

Compounds of Emerging Concern: Karla Fowler provided information about two events happening on March 2 and 3 at the LOTT Regional Services Center. They are a Science Symposium and Public Seminar to hear from national and international experts about compounds of emerging concern (CECs). They will talk about the presence of these CECs in the environment, potential impacts to public health and environment, and what happens to CECs during wastewater treatment and when reclaimed water is infiltrated to groundwater.

Potential Management Scenarios to Evaluate with Modeling Tools

Before the discussion began Lydia provided a couple of reminders about the water cleanup plan development process. Ecology will use the information gained from the model runs and the Technical Report in upcoming discussions about establishing load and wasteload allocations. These are a key component of the Water Quality Improvement Report (WQIR), which is needed to provide reasonable assurances to EPA that we can make improvements and meet water quality standards. Due to Ecology's limited resources, we cannot run every proposed scenario. Today's discussion will help Ecology prioritize and determine which ones they can do.

Mindy Roberts and Greg Pelletier, Environmental Assessment Program, developed a matrix after receiving input during the brainstorming session by the Advisory Group at the September 22, 2011 meeting. The matrix presented is providing three sets of tools: One each for the Deschutes River, Budd Inlet, and Capitol Lake. We're proposing quantifying water quality benefits associated with nonpoint source reductions of 10-20-50 percent in the different scenarios. Later we could get into geographic reductions but right now, we are looking at those percentages.

Background: Ecology staff developed a matrix after receiving input during the brainstorming session by the Advisory Group at the September 22, 2011 meeting. The matrix presented is providing three sets of tools: One each for the Deschutes River Budd Inlet, and Capitol Lake. We're proposing quantifying water quality benefits associated with nonpoint source reductions of 10-20-50 percent in the different scenarios. Later we could get into geographic reductions but right now, we are looking at those percentages.

Matrix details:

- Scenarios sorted into three potential model run categories: Budd Inlet, Capitol Lake, and the Deschutes River.
- Analysis order column: Ranking mechanism.
- Scenario column: Ecology staff's interpretation of the proposed ideas.
- X: Indicates where waterbodies are involved.
- Response column: Provides a brief explanation or additional information on each scenario.

Some scenarios have already been evaluated and there are others where a model is not the appropriate evaluation tool. As a reminder, some model runs will take less time and others will take more. We need to consider our available resources and the requirements (for example staff and computer time) needed for each scenario. Ecology guarantees to run at least one scenario. Today's meeting is to help confirm the interpretation of the brainstormed ideas and to identify the group's priorities.

Ecology: Matrix pages 9-10, we can't quantify changes. Ecology can incorporate these ideas with the Implementation Strategy. These are specific management tools to capture in a "sensitivity analysis" (referenced earlier in the matrix). Turn down the nonpoint sources where they come into the Deschutes River. If we reduce them by x%, what does it get us? We know more needs to be done. The Deschutes River system is complicated. We know we need a reduction in phosphorus.

General Questions & Answers:

- **Advisory Group**: *How will Ecology consider conflicting directions or issues?* **Ecology**: The purpose of the modeling is to translate what the water quality benefits or impairments may be under different scenarios. The modeling provides information to help decide whether to factor in future growth in the Water Quality Improvement Report (WQIR).

- **Advisory Group**: Are there any 303(d) listings for nitrogen? **Ecology**: There is not a water quality standard for nitrogen. If we reduce nitrogen sources the benefits will affect the Deschutes River, Capitol Lake, and Budd Inlet. We would see the greatest benefit in Budd Inlet.

- **Advisory Group**: *When will the modeling results be included in implementation?* **Ecology**: Implementation strategies are included in the Water Quality Improvement Report which will go to EPA in January 2013. The Water Quality Implementation Plan, developed after completing the WQIR, provides specific details for the identified implementation actions.

Deschutes River –oriented potential model runs (Page 7)

The Deschutes River needs a reduction in phosphorus for it to meet water quality standards. Also, we need to think about nitrogen sources because of how it affects Budd Inlet downstream. We will run models to show what we can get with 10-20-50 percent reductions.

There is not a listing for nitrogen because there is no water quality standard for nitrates. There are phosphorus listings for the Deschutes River. We need to reduce nitrogen sources in the Deschutes River, Capitol Lake, and Budd Inlet.

To evaluate benefits for the Deschutes River, we would just look at the Deschutes River model. To look at Budd Inlet, we would go back and change the input source from the Deschutes River to Capitol Lake, by reducing it 10-20-50 percent. We will look at what is above the natural conditions.

Scenario (1) - Reduce nonpoint phosphorus sources (Page 7)

- **Advisory Group**: Page 7, Items 1&2 are the same sides of one coin. What happens upstream is critical. We need to have a clear understanding of what is happening upstream. We need to look at the sensitivity of both nitrate and phosphorus upstream and downstream. This should be a key thing to consider and Ecology should look at the effects of reducing these sources. **Ecology**: Reducing nonpoint sources by 10-20-50 percent will not bring us down to natural conditions.

- **Advisory Group:** The model runs will give us an idea of what we need to meet the reduction targets. We already know we have to reduce nonpoint sources. *What does 10-20-50 percent translate to in mg/L?* **Ecology**: In the Implementation Strategy we need to identify enough actions to meet those reductions. This is part of the Reasonable Assurance piece required in the Water Quality Improvement Report by the EPA.

- **Advisory Group**: If you model changes in the scenario reducing nonpoint nitrogen sources that currently exist in order for us to meet water quality standards, our process should show changes in how we develop, where we develop, how we manage the wastewater, and what to do about stormwater problems. It looks like we're trying to identify what could change when it is more important to identify sources so we can avoid inputs in the future from the same types of development. We need to acknowledge the county is growing. *What about trying to change land development impacts now?* Ecology: Our responsibilities under the Clean Water Act (CWA) are a number one priority. We know nonpoint sources are contributing to the problem and that we need to reduce them. How we get there, or looking at implementation actions, are part of the Water Quality Improvement Report (WQIR). As part of this report, Ecology needs to make a strategic decision on how to allow for future growth.

Scenario (2) – Increase nonpoint sources (Page 7)

- **Advisory Group**: *Is this option addressing wastewater infrastructure?* Yes, we will look at what happens if we transfer sites from septic systems to sewer.

Scenario (3) - Increase channel complexity (Page 7)

One issue in Deschutes River and others is channel complexity, or how the water flows around bends or obstacles. For example, how much woody debris, riffles, or waterfalls are in the system? We know it has changed from past conditions and this is a big issue for temperature and nutrients, and also for dissolved oxygen. Adding channel complexity produces a water quality benefit. We have a friction factor built into the Deschutes River model. Adds more roughness, meandering, into the system and will get us some benefits for both temperature and dissolved oxygen. We can change the model to adjust what comes into the system and what is in the river system itself. Restoration is on kilometer scale. We know less about this process than the scenarios looking at reducing nonpoint phosphorus or sources or increasing nonpoint sources. We are unable to quantify a lot of detail for those options.

- **Advisory Group**: The Deschutes River is not in a major state of alteration. We could consider what we can change and what do we need to know to effect the change. In some areas property owners have made some shoreline modifications. Major diking isn't an issue. There is some loss associated with roads but they will remain in place. The Squaxin Island Tribe and others have looked into restoring vegetation on an individual landowner basis. There is not much value in concentrating on this issue.
- **Advisory Group**: This should remain as a high priority. There are designs in place for channel restoration and work already underway.

Scenario (4) - Shift from septic systems to centralized wastewater (Page 8): This option considers future growth. We do not know yet if the WQIR will address this issue.

- **Advisory Group**: There is available data on population projections. For example, LOTT Clean Water Alliance data projects out to 2053. *Can Ecology use some of the data for proportional potential increases?* **Ecology:** Yes. The Thurston Regional Planning Council (TRPC) has data projecting out to 2040. .There are studies underway looking at a Puget Sound-wide scale with the intent to see what impacts could be by 2070. We can address partly by evaluating water quality benefits associated with a 10-20-50 percent increase. Ecology does not have an official policy on how to handle growth projects. The condition is specific for each TMDL study.
- **Ecology**: We can't evaluate these directly using the Deschutes River model. There is a lot of variability in time and space. We can do quick calculation to look at the population served by septic systems and how much effluent is caused. We could then determine if this is a large or small issue in the scale of problems. Septic systems are a nonpoint source contributor in the system. We don't know if the calculations will provide valuable information. For example, we could review septic systems as part of the suite of nonpoint sources. We could look at the population served by septic systems and their resulting effluent. Disperse sources can get captured in the 10-20-50 percent runs.
- **Advisory Group**: We know one septic system generates 8x as many nutrients as a house on sewer. We know we have a large density of septic systems that are contributing and this is a big load. This option should provide us with the greatest potential to show changes to the nutrient loads to the system and should rank higher.

Scenario (5) – Reduce exempt well withdrawals and conserve water(Page 8): Base flow is a combination of climate and population and we are not able to distinguish the two. We know it has decreased over time. The Technical Report includes information on critical low flows.

- **Advisory Group**: We need to understand these are the water supply for individual homes. Not practical to address this here. Reducing them would take away water from those homeowners. Larger systems already have water conservation plans. Reducing the withdrawals from exempt wells would not reduce the pollutant load.

Scenario (6) – Evaluate potential land conversion (Page 8): We are not proposing any additional model runs for this subject. This isn't something we can evaluate with our available tools. We know that as forest cover is transferred to residential, the results are higher nutrients. This is a very complicated system. We need to know what nutrients are related to forest, agriculture, and residential use. If the

property is privately owned, we can identify where big sources are coming into the system. If we could acquire specific lands, we would know what changes could occur and what benefits would result. We know the Capitol Land Trust and Squaxin Island Tribe are always looking for areas for acquisition, conversion, and conservancy. We can use this for quick calculations. There are no other tools available to address this issue.

- **Advisory Group**: *Does Ecology have information on the Urban Growth Boundary (UGA)?* If the UGA doesn't represent a more portion of the watershed then there isn't much change to result from land conversion.
- **Advisory Group**: It seems like this scenario is easier to get data on than other ones. There is actually a lot of data on forestland. It is not that mysterious and should rank a little higher.

No additional scenarios proposed: The scenarios listed here are not something we can evaluate with our existing tools. Some of the ideas could be considered as possible implementation tools. For example, Revisit Critical Areas Ordinance or encourage cluster housing (both on Page 9).

Manage livestock manure (page 8): This is a specific activity and we do not have a way of quantifying the link with the implementation of livestock manure management program. This is another example of particular management tool we can include in the Implementation Strategy. We know there is more than manure contributing to the Deschutes River and we need to identify the other nonpoint sources.

Budd Inlet/Capitol Lake-oriented model runs

Scenario (1) - Reduce nonpoint nitrogen sources (Page 1): This is using the same approach we used for the Deschutes River options. We're looking at the watershed as a whole and considering the wastewater treatment plants. We would reduce the input sources into Budd Inlet by 10-20-50 percent and see what results.

Scenario (2) - Extending LOTT outfall (Page 1): *What does the advisory group want to consider? What would happen if the outfall was relocated?* We would need to create a process to evaluate this change. If the group decides this is a high priority item, we need more information, such as a list of location latitudes and longitudes for alternative outfall locations. *Where would they like to see the outfall moved to? How many different locations should we consider?* (The smallest model grid cell size is roughly 200 meters by 200 meters.)

- **Advisory Group**: There is a table in the Technical Report which indicates the major source of nitrogen is north of Budd Inlet. The contribution from LOTT is 1% so modeling any changes to the outfall is a lot of effort for little gain. Is it worth asking LOTT to spend millions to extend their outfall? The open boundary sources are the real problem.
- **Advisory Group**: Because the outfall is geographically close to the worst dissolved oxygen grid cells in lower Budd Inlet, it makes sense to look at this option. *Would it have a significant impact?* This could be a relatively inexpensive way to evaluate the need for LOTT to modify their system.

- **Advisory Group**: We need to remember if we put a pollutant into the Puget Sound, we are simply moving the problem elsewhere. Let's not move it but get rid of it. We need to eliminate the pollutant sources.
- **Advisory Group**: LOTT has heard the question before about moving the outfall. They looked at this option in the late 1980s/early 1990s when they were considering nitrogen removal. They have no strong opinion on the matter and feel it would be useful information to have since this is a recurring question.

Scenario (3) – Reduce other South Puget Sound Nutrient Sources (Page 1)

- **Advisory Group**: Is there a way to reduce sources from open boundary into Budd Inlet? Could we look at the potential reductions that could be achieved? **Ecology**: We are evaluating the differential dissolved oxygen impact just in the local area. Most of the nitrogen coming into the Puget Sound is from the ocean. We compare the local controllable source to the differential oxygen concentrations when we apply the water quality standards.

Scenario (4) – Advanced Wastewater Treatment for all plants all the time (Page 1): Under this alternative, we use advanced treatment used by LOTT and apply the process to other smaller wastewater treatment plants. Typical nutrient removal can get wastewater treatment plants down to 6-10 mg/L. LOTT achieves 2 mg/L with special treatment process. This scenario would apply to all four of the wastewater treatment plants in the study area.

- **Advisory Group**: Do the references to advanced treatment mean nitrogen removal? **Ecology**: Yes.
- **Advisory Group**: Has anyone looked at what would happen if LOTT operated year round? **Ecology**: Yes, a scientific study was done so there is some data.
- **Advisory Group**: What if we considered the possibility of LOTT operating fully year round instead of only six months. What could result from this change?
- **Advisory Group**: Can we set all WWTP for different scenarios such as summer months, winter months, and year round? **Ecology**: Yes, we can include different variations. Remember that LOTT is still meeting 5-6 mg/L in the winter months. Ecology will evaluate the current regime of seasonal advanced treatment for scenario 4 based on LOTT's current seasonal limits. If additional seasonal treatment alternatives are needed, then Ecology needs to get input from the Advisory Group on the specific different seasonal discharge options that would need to be evaluated. **LOTT**: Sustaining this operation all year could be complicated. Winter months are challenging.
- **Advisory Group**: We need to consider which option will lead us to meeting the water quality standards. Right now LOTT is achieving WQS all the time. What about the other treatment plants, both here and in the South Puget Sound? Recommend moving "advanced wastewater treatment for all plants all the time" up as a higher priority.
- **Advisory Group**: Prefers Ecology look at the impacts from other wastewater treatment plants who are using biochemical processing to remove nitrogen.

Scenario (5) Shellfish for Restoration (Page 2): Our existing modeling tools do not give us a way to address this scenario. The only way to model it is to consider "mass balance". We can look at existing shellfish and mass without shells and use 3-5% tissue to estimate how many pounds of shellfish we need to harvest to constitute improvement. Our modeling tool does not include shellfish as a stand-alone process. We can look at changes in nutrients to release in shellfish beds using a simple spreadsheet to make calculations. If this is something the group wants to explore, we're at two years off from having the tools to do so.

- **Advisory Group**: Capitol Lake is decreasing overall nitrogen loading by ~15%, probably due to the aquatic life in the lake. This may be a cheap way to reduce nitrogen and is less expensive than the wastewater treatment plant's removal process. This is an option worth considering.
- **Advisory Group**: We want to see lake more usable now than what it has been. Applying bioremediation could result in increasing dissolved oxygen levels. Shellfish grow rapidly in the right conditions. Because of low dissolved oxygen they are inhibited even with local indigenous population of oysters. We should consider some bioremediation efforts such as what happens in Japan. Ecology has used bioremediation for oil spills on land surfaces and groundwater.

Scenario (6) Decrease Boat Waste Disposal in Budd Inlet and Marinas (Page 2): Our existing modeling tools do not give us a way to address this scenario. All the nitrogen from this source comes from human urine. Discharges are going directly into marine waters and the surface layer. The models do not have an option to reduce boater wasteloads so we cannot remove it from the scenario. Generally, the problem increases in the summer or when the weather is good and boaters are out. We could do a simple calculation to estimate potential discharges? Is this a dominant source or something negligible?

<u>No additional scenarios proposed</u>

Install aerators in Budd Inlet (page 2): This is not in the top tier of the model. *Does the group feel this is more important than other scenarios?* We could run some simple calculations

Shift from marine discharge to groundwater recharge (page 2): We do not have the tools to evaluate results from moving the discharge upstream to groundwater. The best way to evaluate this is a focus study to move the nitrogen elsewhere.

Establish no discharge zone (-page 3): The Clean Water Act provides this as a management tool approved by the EPA. We can use it to ensure there are enough boater pump out stations. Provide infrastructure to reduce discharge. Public education on this topic is key and is happening now on a Puget Sound-wide scale. The Puget Sound Partnership and consultants are reviewing this and the work will result in a future benefit to Budd Inlet

Nutrient trading (page 3): We can address this option better in the Water Quality Implementation Plan. Additional modeling will not give us the information we need right now. At that time we can clarify what we want to trade and with what. We need to identify the allocations first so we know the reductions needed. This will help determine if trading is a cost effective and viable option.

Capitol Lake –oriented potential model runs

Scenario (1) – Reduce nonpoint phosphorus sources (Page 5): This is using the same approach we used for the Budd Inlet options.

- **Advisory Group**: Has Ecology established a natural loading level for phosphorus in Capitol Lake? **Ecology**: Yes, we used it in the Technical Report.

Scenario (2) – In-lake treatments to inactivate phosphorus (Page 5): We can consider alum application and evaluate what would happen if we strip out phosphorus from the water column.

- **Advisory Group**: We usually associate phosphorus with anoxic conditions. The benefits of this option would be short lived, perhaps only for a season. **Ecology**: Agreed. There likely wouldn't be much benefit.

Scenario (3) - Riparian plantings (Page 5): We could do a sensitivity analysis. We could alter the temperature of incoming water to Capitol Lake and look at impacts. We could examine how much temperature change in the river could improve the water quality in the lake. There may not be much impact since water generally cools as it moves farther down the system.

Scenario (4) - Remove dam (Page 5): The Technical Report already addresses this scenario.

No additional scenarios proposed: Some of the ideas listed here are specific implementation actions to reduce nonpoint sources.

Eliminate stormwater outfalls to Capitol Lake (page 5):

- **Advisory Group**: Ecology needs to look at this issue for both Budd Inlet and Capitol Lake. Separate the nonpoint sources Look at both phosphorus and nitrogen. Does Ecology have a good idea how the algae and plants use, recycle, remove, or transfer these? Ecology: Modeling is simulating the process and results are already included in the Technical Report.

Nitrogen removal:

- **Advisory Group:** Nitrogen is removed from the water when plants use it. We need to figure out a way. We need to consider how to treat stormwater, which goes downhill and eventually discharges into the Puget Sound. Shifting it from one location to another doesn't address the problem. We need to stop it.

- **Advisory Group:** There are studies happening know to get more information on best management practices (BMPs) in urban and suburban areas.

Bioremediation:

- **Advisory Group:** This is a possible cost effective option to consider. **Ecology**: Macrophytes get nutrients from the sediments. We could evaluate with the model if it is determined a high enough priority.

- **Advisory Group**: Sometimes with macrophytes you can get algae blooms instead. You're not able to remove enough nutrients to prevent algae blooms.

The documents, "Budd Inlet, Capitol Lake and Deschutes River TMDL ****DRAFT** Potential Management Scenarios to Evaluate with Modeling Tools **DRAFT**** presented before and after the February 23 meeting are available at:

- Draft matrix presented *before* the meeting: http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/advisorycomm/022312DeschutesAdvMtgMatrix.pdf
- Draft matrix revised *after* the meeting: http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/advisorycomm/022312DeschutesAdvMtgMatrixRev.pdf

Open Comments

Pete Heide: "TMDLs are to get water cleaned up. Don't pass up ways to get there. We need to address them all." *(Referring to model scenarios discussed during the meeting.)*

Chris Stearns: *(Paraphrased)* The approach is cost efficient to get us our goals scientifically and in the public process – how they contribute. We need to build momentum.

Next meeting

Date:	Thursday, March 22, 2012
Time:	9:00 a.m. – 12:00 noon
Place:	Tumwater Fire Department, 300 Israel Rd. SW, Tumwater
Agenda:	Discussion on Implementation Strategy Components