

PugetSoundPartnership

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Water Quality

Comments Submitted via Discussion Forum

4/14/2008 – 5/9/2008

From: Rebecca Post

Date: 05/09/2008

Comment: The Department of Ecology Spill Prevention, Preparedness and Response Program submitted the following letter and attachment.

SUBJECT: Water Quality Topic Forum Document
Spill Program Comments

Thank you for the opportunity to comment on the draft Water Quality Topic Forum document. The Department of Ecology's Spill Prevention, Preparedness and Response Program (Spills Program) is committed to being a constructive and collaborative contributor to the Puget Sound Partnership's work to develop an integrated plan to restore and protect Puget Sound.

The nature of our program's comments may be somewhat atypical because the draft Water Quality Topic Forum document does not significantly address marine transportation oil spills. This leaves us with few specifics upon which to comment. Therefore we are submitting general comments in this letter, and will also separately provide additional content on oil spill science and policy issues for insertion into the report, as appropriate.

We believe that oil and hazardous materials spills represent an important and distinctive threat to Puget Sound, and that the significance of such spills is understated in the report. While it is true that the day-to-day total pollutant loading from small spills into Puget Sound may be significantly less than other pollutant sources, these spills represent unauthorized accidental pollutant discharges directly into waterways with resulting acute and chronic effects.

However, a very serious threat to the long-term health of Puget Sound comes from major and catastrophic spills. These petroleum releases are low probability events with potentially extremely high consequences. Major and catastrophic spills have the potential to set back years of progress in restoring Puget Sound. These releases are challenging to address because they can come from numerous potential sources including maritime shipping, transmission pipelines and refineries.

The good news is that the state's Spills Program has proven to be effective in

its regulatory and non-regulatory work with federal partners and stakeholders to dramatically reduce the frequency of all major spills, and particularly those over 100,000 gallons. In fact, we have not experienced an oil spill over 10,000 gallons from a vessel source in over 13 years. While we have made considerable progress, much remains to be accomplished.

Federal programs with their diverse responsibilities are not able to provide an adequate level of oil spill protection for the unique values and environmental sensitivity of Puget Sound. The state Spills Program also produces results in an arena where the US Environmental Protection Agency and Coast Guard have yet to delegate federal authority. Fortunately, the Governor and legislature have long recognized the importance of preventing and responding to oil and hazardous material spills, and have provided the state's program with broad authority and funding.

Attached is a list of important unmet needs in the state's spill program. We recommend you consider adding these to the sections of the Water Quality Topic Forum document that identify limitations of existing programs and preliminary recommended near-term strategies.

With respect to the format of your report, we recommend a preface be developed to help guide reader on:

- . The purpose of the document.
- . How it fits into the broader process of developing a new Puget Sound recovery and protection plan.
- . The role of the document in educating policy makers, the public and stakeholders.
- . The next steps in the process.

Thank your for the opportunity to provide comments, and for your contributions to building a sound technical and policy base for the Puget Sound Plan.

Attachment

Spills Program Comments on the Water Quality Forum Report Near Term Strategic Needs

Ecology places a high priority on preventing oil spills and ensuring effective responses to oil and hazardous materials spills statewide. The following actions would help reduce the threat posed by spills and further Ecology's ability to meet the legislatively mandated goal of "Zero Spills."

We ask that the Puget Sound Partnership consider incorporating policy statements into the report that support the following needs.

State Spill Program Funding

Program Operating Budget - Revenue Shortfall - The Oil Spill Prevention Account funds the state's spill prevention and preparedness efforts. This account will reach a critical point beginning in fall 2009 when expenditures will begin to significantly exceed receipts. Adequate and stable funding is critical to the future success of our Spills Program.

Spill Prevention

Emergency Response Tug at Neah Bay - Since 1999 the standby emergency response tug has assisted 40 ships and barges in the Strait of Juan de Fuca and off our outer coast. At this time we only have funding for the tug through fiscal year 2009. The tug is a key component of our spill prevention efforts that target major and catastrophic vessel spills. June 30, 2008 will be the last day of service unless a stable federal or state funding mechanism is established.

Federal Delegation - We will be working with the Governor's office, Legislature, Congressional delegation and federal agencies to obtain delegated authority from the United States Coast Guard to perform high priority vessel inspections, conduct investigations, and complete other critical work to enhance vessel safety in Puget Sound.

Enhance Oil Transfer Inspections - Target inspections and oil spill prevention educational visits during fuel transfers from tank trucks, marinas, and boat yards where spills threaten Puget Sound.

Eliminate Oil and Oily Wastewater Dumping from Regulated Vessels - Develop a low-cost waste oil reception program and strategically place receiving facilities or encourage port authorities in Puget Sound to provide vessels an incentive to off load these toxic contaminants.

Reduce oil dumping and spills from small vessels by 75% - Substantially expand the state's spill prevention education program targeting small vessels and marinas, through the both Ecology's work and critical environmental partnerships.

Spill Readiness and Response

Dramatically Expand State Capability to Respond to Major and Catastrophic Oil Spills - Our long term goal is to safely and effectively continue on-water oil recovery at night (24 hour per day) and during inclement weather during major spill incidents. This would require having additional incident command, remote sensing, spill tracking and skimming vessel operational capabilities. This level of operational readiness would have the potential to double or even triple the amount of oil recovered before it impacts beaches. If completed, this initiative would make significant progress toward aligning real on-the-ground capabilities with very high public expectations.

Increase Community-Based Spill Response and Containment Capabilities -

Fund and distribute additional spill response equipment (caches) to local communities. Train local agency responders who are first on-scene at spill and can initiate the most effective response.

Management of Volunteers during Major Oil Spills - Develop a volunteer management program to respond to growing public expectations that Ecology will be able to effectively integrate volunteers into the response of a major oil spill. Volunteers become an integral component to mounting a quick and effective response when a spill occurs. A lesson learned from the Cosco Busan spill in San Francisco Bay is that concerned citizens stepped forward in large numbers, and we must be prepared to utilize their capabilities. It is also very important to get as many resources on the ground to protect valuable habitat, and make sure the efforts of well meaning volunteers are focused and do not cause damage to sensitive beaches, wetlands and archeological sites.

Response Technologies - Although oil spill prevention is the key to keeping oil out of the environment, accidents do happen. It is important that responsible parties are trained and equipped to properly respond to potential spills and that the most effective response technologies are brought to bear early on in the response effort.

Basic research is still needed on various response technologies, including the effectiveness of dispersants in cold waters, the utility of chemical shoreline cleaners, and the ability to track an oil spill at night or in the fog.

From: Mark Hersh

Date: 05/07/2008

Comment: Ecology recently released two documents, one marked "draft," dated April 3, 2008, and the other a letter from Jay Manning to the Forest Practices Board, dated April 4, 2008.

The Ecology documents state that the monitoring/adaptive management program set up by the Forests and Fish Report in 1999 will fail to provide Ecology with the needed information whether to extend the "Clean Water Act assurances" provided by both Ecology and EPA in 1999. The assurances were designed to delay the development of TMDLs for watersheds all or predominantly in forests.

This relates to the Partnership's effort in two ways. First, we do not know whether the current forest practice rules will attain water quality standards, including numeric water quality criteria (temperature and sediment) as well as biological integrity (protected by the antidegradation policy of the water quality standards). Studies have not been initiated, or if they have, completed to tell the story whether the forest

practice rules protect biological integrity of headwater streams (for the most part, those considered "Type Ns" and "Type Np" in the forest practice designations). Some of these habitats and the species they support will not be found elsewhere in the watershed (earlier comments by the Puget Sound Environmental Caucus on Land Use/Habitat pointed out that Washington's standards were recently revised to explicitly include protection for all aquatic species, fish and non-fish).

Therefore, both final issue papers need to point out that water quality and habitat may still be adversely affected by ongoing forest practices (besides the legacy of past practices with which we must deal).

Second, this relates to the highly-touted monitoring and adaptive management program that came out of the Forests and Fish negotiations. This may be used as a model for a Puget Sound monitoring/AM program. The evident problems of this program in developing the data needed for some of the most basic questions on water quality and habitat show that there are some serious flaws that must be investigated and considered before adopting this same approach for Puget Sound restoration, an effort that will require monitoring many more habitats, species, and parameters than the Forests and Fish effort has had to deal with.

From: James West

Date: 05/06/2008

Comment: I concur with earlier comments regarding the underestimation of threat from oil spills, especially those regarding the cumulative effects from chronic inputs of PAHs to the system via small, unreported spills.

I concur that sea-surface microlayer is an important concept regarding the fate and transport of toxics in Puget Sound, and is a gap in this report.

Perhaps the most serious gap in this report resulted from the decision by the authors to omit "toxics in biota" from the discussion (apparently assuming the Species Forum would cover that issue). The Species forum has not addressed toxics in biota, so to be consistent with the Partnership's Indicators and Risk Analyses processes, toxics in biota should be dealt with here.

Toxics are not an issue in the ecosystem unless organisms are (a) exposed (I'd include here the potential exposure from sediment-sequestered compounds and (b) affected by that exposure in some negative way. The literature and ongoing monitoring and assessments of exposure and effects in Puget Sound is rich, long-running and needs to be reviewed here.

Relative to toxics, too much emphasis has been placed on "stormwater" as a threat. Of course we need to understand stormwater's role in the ecosystem as a conveyance for toxics (and other threats), however we lack an understanding of the exposure and effects of many of these toxics on biota. A more balanced approach is needed here, wherein the threat to ecosystem (biota) health from toxic constituents in stormwater can be better evaluated. Standards to protect biota health do not exist for most toxics, and the ones that exist are inadequate.

From: Alan Mearns

Date: 05/06/2008

Comment: I have found it difficult to locate in the white papers information on chemical contaminant patterns and trends in Puget Sound and the Georgia Basin area. The absence and patchiness of such information leads to a lot of speculation about the Sound's water quality and trends.

NOAA has a National Mussel Watch Program that now includes 15 sites in Washington marine waters, in addition to over 200 sites around the rest of the US. Many of the sites have been monitored for nearly 20 years yielding trend and geographic data on over 150 individual chemicals including PCB's, pesticides, trace metals, vessel anti-fouling paint compounds, dioxins, and polycyclic aromatic hydrocarbons (PAH's). Recent analyses include polybrominated diphenyl ethers (PBDE's the fire retardants). Last year the Snohomish County Marine Resources Committee added 3 additional sites to the program, including a comparison of contaminants in both wet and dry seasons. In addition, NOAA has sponsored analyses of dated sediment cores that provide a history of Puget Sound contamination back to the 1880's.

Mussels and oysters concentrate chemical contaminants from low levels in the water, thus making it easier for marine chemists to document water quality trends. These data offer a rich source of information about which chemicals are important, which are not, which ones have been increasing and which have been decreasing in the Sound and Straits. For example, PCB's and chlorinated pesticides have been decreasing during the past two or more decades. PBDE's have been increasing. PAH's may be decreasing slowly, albeit with unexplained rises and falls.

Metals have remained unchanged and indeed the data show that levels of metals in Puget Sound mussels are lower than in mussels from the cleaner outer coast of Washington. The 45 PAH's yield "fingerprints" that suggest that the dominant source of hydrocarbons is from surface runoff, not oil spills, and that, during the 1990's, Puget Sound had been among the most PAH-contaminated regions in the US. The

recent MRC study indicates that PAH contamination is much higher in the winter wet weather season than in the late summer dry season, supporting the idea that they are coming from runoff.

The dated cores reveal that Puget Sound sediments were much more contaminated with PCB's, PAH's, metals and pesticides in the 1940's to 1960's than they are now, with peak PAH contamination occurring during World War II. For example, perhaps much of what we see today may be a legacy of the World War effort coupled with ongoing pollution from highways and parking lots.

Existing data from both the mussels and cores can be used to forecast what contaminant levels might be like in 2020 if we take no further actions. Continued monitoring will be vital in confirming trends and the effectiveness, or lack thereof, of action programs.

The abbreviated format of past Puget Sound State of the Sound reports has limited the amount of material that has been presented to the public from this rich information (basically one page every several years). Time has not allowed me to present a more detailed account of these data here. The Puget Sound Partnership needs to take a deeper look at this information and use it to help prioritize contaminants of most concern, evaluate fate and transport models and make projections of trends. NOAA budget cuts threaten to terminate the program this year. Therefore, the PSP and the State of Washington should seriously consider urging NOAA to continue the program OR take over this monitoring program through 2020, and enhance it with carefully selected sites, adding emerging contaminants and using the data to validate models. This action will provide the public, lawmakers and the PSP with hard data on the regional effectiveness, or not, of new actions.

I will be glad to present more of this information before the PSP, the Leadership Council and/or the Science Panel.

The views expressed here are solely those of the writer and do not connote NOAA policy.

References

O'Connor, T.P. and G.G.Lauenstein. 2006. Trends in chemical concentrations in mussels and oysters collected along the US coast: Update to 2003. *Marine Environmental Research* 62(2006): 261-285.

Mearns, A.J. 2001. Long-term trends and patterns in Puget Sound, the Straits of Juan de Fuca and the Pacific Coast. Paper 5A. *Proceedings of Puget Sound Research 2001: The Fifth Puget Sound Conference*. Puget Sound Water Quality Action Team,

Olympia, WA.

Lefkovitz, L.F., V.I. Cullinan and E.A. Crecelius. 1997. Historical trends in the accumulation of chemicals in Puget Sound: NOAA Technical memorandum NOS ORCA 111. National Ocean Service, National Oceanic and Atmospheric Administration, Silver Spring, MD. 60 pp+ append.

From: Jacqui Brown-Miller

Date: 05/05/2008

Comment: This Comment is submitted for the Washington Oil Spill Advisory Council. A better formatted and footnoted version of this comment is being submitted to the Partnership via e-mail and is also being placed on the Council's web site at www.governor.wa.gov/osac.

II. (S1) What is the status of water quality in Puget Sound?

Qualitatively speaking, water quality in Puget Sound should support:

- o Thriving populations of plants and animals that are important for the web of life.
- o Human health, wellbeing, and welfare.
- o Local industries and economies that depend on well-functioning ecosystems and pristine resources.

Specifically, water quality in Puget Sound should be clean enough to support:

- o Flourishing populations of fish, bird, and marine mammal species, none of which are threatened or endangered.
- o Maintenance of uncompromised ecosystem services that Puget Sound gives and which support the health of various species, humans, and our local economies.
- o Ample opportunity for local people to swim and fish in Puget Sound and to eat Puget Sound's bounty without accumulating toxic body burdens, the long-term affects of which we still do not know.
- o An environment in which marine recreation is safe and appealing.
- o Shellfish growing, fisheries, tourism, and indigenous population subsistence.
- o The psychological and spiritual tranquility that comes from knowing we are living in harmony with our surroundings.
- o Future generations, our grandchildren's grandchildren, who can enjoy the same healthful and supportive Puget Sound our grandparents did.

A healthy Puget Sound would contain no more oil-related toxins than our local ecosystem can tolerate and still support the above values. Currently, we can not say oil-related toxins in Puget Sound are low enough to support the above values.

A. What are the documented threats to fresh and marine water quality, in particular from toxic oil spills?

1. Risks associated with directly-to-water oil spills.

The Initial Discussion Draft of the Water Quality Topic Forum paper, in science question one, makes the following observations: The total amount of reported oil and petroleum products from reported spills directly to surface waters in Puget Sound was about four percent of the amount estimated to enter via surface runoff. When the relatively rare large spill occurs, it often has a large local impact, including acute toxicity to organisms and plants. Shellfish and other types of marine commercial and recreational harvest are usually curtailed. Thereafter, aside from treating any oil that may be a part of storm water, the paper makes no mention of the need for the Partnership to address oil spills to water.

The paper vastly understates the threat in-water oil spills pose to the Sound-- in terms of how often they can occur, how large they can be, and the potential long-term toxic impact. The Council recognizes that oil as a component of storm water is an important and challenging issue and believes the Partnership should address this issue. However, addressing spills directly to water is equally important.

2. How often should we expect serious spills and in what volume?

In 2000, the U.S. Coast Guard commissioned a study to assess the risk of oil spills in the United States. Table 2.2 of the report provides the number and volume of oil spilled by vessel type for the period from 1985-1999 using an overall input from a spilled volume of 42,301,810 gallons. The data in the table shows tankers are the major contributor of spilled oil into U.S. waters in terms of volume spilled, followed closely by barges. Freighters (including bulk carriers and container ships) are the third largest contributor, and fishing vessels are fourth in volume contributed.

Table 2.2 Volume of Oil and Number of Spills by Vessel Type in U.S. Waters, 1985-1999.

Vessel Type/	% by Volume/	Volume (gal)/	% by Number/	Number
Tanker	55.4	23,435,203	8	4,640
Barge	27.6	11,675,300	17	9,861
Freighter	8.7	3,680,257	10	5,801
Fishing	4.3	1,818,978	23	13,341
Passenger	0.5	211,509	5	2,900
Recreational	0.3	126,905	15	8,701
Other vessel	3.2	1,353,658	22	12,761

Source: ERC data compiled for this study (2001).

The table shows tankers responsible for over 4,500 spills, barges for over 9,800 spills, and freighters for over 5,800 spills. This is an average of 1,450 spills per year nationwide. Regarding anticipated trends from 2000 to 2010, the report noted the following about the serious risks cited in the table:

- o For tanker spills, there is a possible increase of a major spill from what was reported.

- o For barges and freighters (cargo vessels) the threat is expected to remain stable. The amount of oil that could be spilled in one accident ranges between one gallon and 630 million gallons (the biggest tank ships that come into Puget Sound can carry over 1.5 million barrels (630 million gallons) of combined crude oil and fuel oil). The 2007 Cosco Bussan accident and resulting spill to San Francisco Bay -- just over 53,000 gallons-- was widely labeled a "moderate sized spill." Another thing to consider is that with increasing international commerce, cargo vessels are getting much, much bigger. This means the size of the bunker tanks is growing, increasing the risk of larger spills.

The above information pertains to a nationwide threat. What about the Sound? What are the chances each year of a mid-level to a catastrophic-level spill in Puget Sound? This question was somewhat answered by the Coast Guard in 1999. In a study relating to Puget Sound, the Coast Guard provided baseline spill analysis for the "probable" case, given the various planned risk mitigations (programs and laws designed to reduce risk) such as double hulled tankers. The study projected risk from the years 1997 to 2025. Table 32 shows this probable estimate per year, for all tankers, tank barges, and cargo vessels combined, as follows.

Total No. of Accidents

1997 3.79239

2010 4.97091

2025 6.65715

Total Accidents with Oil Outflow

1997 0.20240

2010 0.230189

2025 0.28136

Total Outflow in barrels

1997 1,016.1

2010 737.0

2025 725.3

Table 32 Baseline-Projected Spill Volumes and Number of Accidents per Year
(reference case based on "probable" estimate of spill frequency)

In essence, the probable case shows the number of collision and grounding accidents increasing by 71% over the study period. This is primarily due to a predicted increase in vessel traffic. The number of collision and ground accidents which result in spills greater than 10,000 gallons increases by 37% over the study period. The more gradual growth in spills as compared to accidents has to do with the transition into double hulls for tank vessels and by the expectation that crude oil receipts will remain flat over the study period.

This indicates the following:

- o In 2010 there will be almost five accidents per year, .23 of which will lead to the outflow of 737 barrels of oil-or almost 31,000 gallons.
- o In 2025 there will be over six accidents per year, .28 of which will lead to the outflow of 725 barrels of oil-or almost 30,500 gallons.

Certainly, many things will affect these numbers. However, this is an oil spill risk in Puget Sound that should not be ignored.

This is especially true given that oil spills do not necessarily "evaporate" shortly after it occurs. As described below, thick and viscous oils persist in the environment, sometimes for decades-even indefinitely. If Puget Sound saw one thick goopy and toxic oil spill- like thick bunker fuel-each year, or even every decade, it is likely that the Sound would sustain very serious cumulative impacts.

3. How long do oil spill toxics persist in the environment?

Oil released into marine waters may be comprised of various materials, including crude oil, refined petroleum products (such as gasoline or diesel fuel) or by-products, ships' bunkers, oily refuse, or oil mixed in waste. Scientists have made significant progress in determining how oil impacts the environment. However, the answer depends on the oils chemical composition and where it lands in the marine environment.

Tracking oil's sources, fates, and effects is challenging. First, oil is a complicated mixture of hundreds, or thousands, of chemicals. Every oil source, even among similar types of oil (such as crude or fuel oils, for example), can have distinctive compositions depending on the oil field they are from and how they are refined.

Second, when spilled into marine waters, this varying and complex mixture of chemicals enters a complex chemical stew of seawater, mud, and marine organisms. The oil is stirred by currents, tides, is altered by other physical processes, and

changed by chemical reactions and interactions with organisms in the sea.

The lighter fractions of oil, such as benzene and toluene, are highly toxic, but are also volatile and evaporate quickly. Heavier components of crude oil, such as polycyclic aromatic hydrocarbons (PAHs) appear to cause the most damage. While they are less toxic than the lighter volatiles, they persist in the environment much longer. A heavy oil spill can also blanket estuaries and shoreline ecosystems such as salt marshes and tidal pools or lagoons, preventing gas exchange and blocking light. The oil can mix deeply into pebble, shingle or sandy beaches, where it may remain for months or years.

This is a result of the fundamental chemistry of oil compounds. They do not dissolve in water. Therefore, they adhere to particles in the water or get incorporated into biological debris. From there, they settle from the water column and become part of the sediments on the bottom. Once mixed into the sediment, oil and its chemical constituents can persist for decades, depending on the environment. In areas swept by high energy current, the material may be dispersed. But in areas where sediments accumulate, contaminated sediments are an environmental concern-both when lying on the bottom where organisms can expose themselves to it and when dredged.

There are several examples of toxic oil elements persisting indefinitely in the marine environment, even though surface sediments may appear healthy. Still today after nineteen years, oil from the 1989 Exxon Valdez spill persists in an only-slightly weathered form below the surface at some beaches along the Gulf of Alaska. National Oceanic and Atmospheric Administration's scientists analyzed subsurface oil at 10 beaches, selected at random from among oil-contaminated areas included in earlier studies.

Earlier research demonstrated buried oil could retain toxic components for years if buried in anoxic (oxygen-depleted) sediments where little decomposition from weathering occurs. The new study identified a newly discovered mechanism that allows oil to be preserved in sediments that do contain oxygen. Oil can persist if it exists in a thick, emulsified "oil mousse" that resists weathering. Their researchers concluded that it can stay there for decades and "pose a contact hazard to inter-tidally foraging sea otters, sea ducks, and shorebirds, create a chronic source of low-level contamination, discourage subsistence in a region where use is heavy[,] and degrade the wilderness character of protected lands."

Toxic oil impacts also persist in Massachusetts, 38 years after a barge ran aground off Cape Cod, rupturing its hull and spilling 189,000 gallons of number two fuel oil that winds and waves pushed onto the beaches and marshes of West Falmouth. As of 2007, oil still persisted in the marshes. Bacteria had degraded the most easily eaten

oil compounds soon after the spill, but then moved to their more typical fare. Therefore, the bacteria were no longer eating the oil, leaving it to do continuing damage.

PAHs were found to still be present, indicating life in the marsh is still affected by toxins from the spill. One particular species was quite dramatically affected. The observations of scientists showed that where oil concentrations were present, there were fewer crabs and they moved more slowly as if they were intoxicated from exposure to residual oil. Worse, observations showed that in the areas of the highest concentrations, crabs stopped burrowing downward when they ran into oil and then moved sideways through the sediments.

This left them vulnerable to predators and prevented the crabs from tilling the salt marshes so that the marsh grasses could grow better.

We can expect that well over half of every oil spill that has persistent characteristics will remain (with its toxic constituents) in some portion of the environment, just like the Exxon spill and the Cape Cod spill. It is generally accepted that once an oil spill happens, it is almost impossible to completely clean up-- experts generally call it a success when able to recover 36 percent of the spilled oil. Of the 53,500 gallons of bunker fuel spilled into San Francisco Bay, almost 40,000 gallons remained in the environment. Chemical analysis of the oil spilled in San Francisco Bay showed high levels of PAHs and three other carcinogenic chemicals: Pyrene, at 1100 parts per million, phenanthrene, at 2000 parts per million, and another called two-methylnaphthalene, at 1800 parts per million. Along with the heavy bunker fuel, these chemicals could easily remain in the ecosystem by finding their way from the water column into the sediments where they will interact with animals and organisms.

Again, if Puget Sound saw one thick gooey and toxic oil spill- like thick bunker fuel- each year, or even every decade, it is likely that the Sound would sustain very serious cumulative impacts.

Below is a discussion of some of the specific ways that oil spills threaten the values we need Puget Sound to support.

4. Toxic impacts to species, including humans.

A particularly deadly fraction of oil, polycyclic aromatic hydrocarbons or PAHs, cause long-term injury at minute levels of parts per billion. Scientists have linked PAH exposure from lingering oil to long-term injury in a variety of fish, birds, and mammals. A team of scientists summarized decades of oil spill studies in the magazine Science in December 2003. The team wrote that PAHs are deadly actors

linked to long-term injury, including reproductive failure, disruption of cellular function, and death. Other constituents can include the carcinogenic chemicals Pyrene, phenanthrene, and two-methylnaphthalene. Again, there are thousands of chemicals that can be part of oil.

a) The resident killer whale and other marine life.

For the Southern Resident killer whale, a huge spill (the size of the 450,000-gallon spill like the Tenyo Maru in 1991 or the 11 million-gallon Exxon Valdez spill in 1989) would spell disaster. This population is listed as endangered under the U.S. Endangered Species Act. The proposed Recovery Plan for the whale identifies oil spills as a primary threat for the endangered Southern Residents. Also, available evidence suggests killer whales are unlikely to detect and avoid spilled oil.

We understand, as it was widely reported, that the Valdez spill killed 25 killer whales. Numerical estimates of the Puget Sound resident population range from between 90 and 176. A loss of 25 individuals could cause the elimination of resident population in Puget Sound. Yet, even smaller spills are bad for whales because they irritate eyes and skin, and contaminate prey.

Oil spills are also potentially harmful to other threatened and endangered species, such as salmonids with navigational systems that can be affected by toxics, as well as wild seabirds such as the Marbled Murrelet, which feeds on forage fish.

b) Impacts to humans.

Humans, of course, are negatively affected by toxics that find their way into our marine environments, including those from oil spills. In recent years, several studies have been done, including several studies by the Center for Disease Control, to track the accumulated body burden of industrial and synthetic chemicals and to study the potentially serious long-term affects of this exposure. It would take a study to determine whether the bio-accumulating chemicals include the chemical constituents found in oil. Needleless to say, however, exposure to these chemical constituents, whether from dermal exposure or through ingestion, is not healthy to humans.

5. Economic damage.

Part of the Partnership's mandate is to provide for the economic well being of the Puget Sound population. What would be the economic costs of an oil spill? There is no definitive answer to this question. Experts calculate, however, that significant oil spills in Washington waters could result in hundreds of millions, if not billions, of dollars of socioeconomic impacts. This is at a minimum.

Yet, this measure -- socioeconomic damages-- does not incorporate a spill's impact on several other things. These include economic measures of a loss of longer-term quality of life, psychological impacts, and spiritual values. These also include economic measures of the ability of a damaged natural environment to provide us with valuable ecosystem services.

(a) Socioeconomic costs-damages measure one.

To the tune of hundreds of millions, if not billions, of dollars, socioeconomic impacts would be felt by the region, local communities, residents, the state, and the federal government. These impacts include damages to real and personal property, loss of use of natural resources (parks and recreation areas), and loss of income and expenses (fishing, tourism, recreation, shipping and other commerce). As a major shipping port and tourist and recreation area, Puget Sound is particularly vulnerable to socioeconomic impacts from oil spills. Reduction in tourism, commercial fishing, and blocking the shipping port could have widespread impacts. There can also be serious impacts on the Tribal Nations, particularly with respect to subsistence fishing. A spill could also disrupt the state's transportation system as ferry traffic could be suspended or rerouted.

Socioeconomic costs are based on the real and perceived impacts, which are related to the degree of oiling, the oil type and persistence, the degree to which cleanup operations can mitigate the oil impacts, and the time of the impact.

(b) Loss of longer-term quality of life, psychological impacts, and spiritual values-damages measure two.

How does one place a value on a loss of life's quality for the people of Puget Sound as a result of oil spills? What about a loss of elements within the environment that give us spiritual inspiration? And what of the psychological impacts of a people who no longer are to be connected to nature-no longer able to swim in Puget Sound or eat its bounty without fear of being harmed?

(c) Lost ecosystem services-damages measure three.

Modern economic thinking is beginning to incorporate the loss of ecosystem services into damages calculations. When portions of the commons that belong to all humanity are lost, the ecosystem services provided by those resources are no longer available to humanity. An oil spill would damage the environment's ability to provide us with valuable ecosystem services.

Generally speaking, ecosystem services include provisioning, such as the production

of food and water; regulating, such as the control of climate and disease; supporting, such as nutrient cycles and crop pollination; cultural, such as spiritual and recreational benefits; and preserving, which includes guarding against uncertainty through the maintenance of diversity. The services of ecological systems and the natural capital stocks that produce them are critical to the way the Earth's life-support systems function. These directly and indirectly contribute to human welfare and represent part of the total economic value of the planet.

Coastal systems, including estuaries, coastal wetlands, river deltas and coastal shelves, are particularly rich in ecosystem goods and services. They provide widely ranging and highly valued resources that include fisheries, open spaces, wildlife habitat, nutrient cycling, and recreational opportunities.

Economists are working to develop better frameworks for assessing and valuing the goods and services provided by coastal systems. If we add the loss of ecosystem services to previous socioeconomic damages assessments, damage amounts exponentially increase.

B. What are the sources of toxic oil spills to Puget Sound water bodies? Variability between catastrophic and chronic small.

Both large and small spills threaten and have harmed Puget Sound. One major spill from an oil tanker, a refinery, or a pipeline, could significantly impact the accomplishments made toward the 2020 goal. Additionally, the 2020 goal could be thwarted by the fact that Puget Sound is slowly being fowled by small, chronic spills that add up.

The threat of large oil spills come principally from high-volume commercial activities. An oil spill large enough to cause catastrophic impacts to our natural resources and economy could happen at any time. A very large oil spill, such as one from an oil tanker or a refinery, would be devastating to almost every value mentioned above that we want the Sound to support.

Yet, small, chronic spills continue in Puget Sound with an unknown number of spills releasing an unknown number of gallons of oil into Puget Sound each year. Experts agree that these spills add up over time to be a big problem, and they are very damaging to the Sound's ecology. Sources of these include point source pollution from near-water activities (above ground storage tanks, gas stations, railroads) and sources associated with small scale water related activities (marinas, recreational boaters, fishing vessels, small work boats, two-stroke engines, and derelict vessels).

On October 12, 2006, the Seattle Post Intelligencer ran a story on oil spills and published the map below to show how the many small spills in Puget Sound

accumulate to represent a major problem. The map was based on data provided by the United States Coast Guard.

In general, oil spill threats include, but are not limited to:

- o Ship collisions and groundings.
- o Oil processing, storage, and transfer facility failures.
- o Failures of shipboard equipment, often due to the failure to do proper maintenance.
- o Failure to implement proper procedures.
- o Intentional disregard of regulations.
- o Sinking of derelict or abandoned vessels.
- o Small spills from recreational boaters and fishing boats on which navigation and fuel bunkering are ancillary to recreation and fishing.

From: Art Castle

Date: 05/05/2008

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theme in every document. Low Impact Development techniques, especially bioretention cells and pervious pavement, are very effective in providing dramatically enhanced water quality treatment. They naturally treat or dramatically reduce a wide range of stormwater pollutants including hydrocarbons and dissolved metals. The Department of Ecology currently considers bioretention cells as "enhanced water quality treatment facilities" and we believe that pervious pavement where the stormwater goes to soil should also be approved as an "enhanced water quality treatment facility." The research clearly shows the performance and results.

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Voluntary or Required

We believe that Low Impact Development should remain a voluntary stormwater mitigation strategy. Certainly incentivized to encourage its use where appropriate, but should not be required. Low Impact Development practices are not appropriate for all sites. LID practices are important, but only a partial solution to proper stormwater management. Other stormwater techniques such as regional or area management are other parts to the stormwater puzzle. In areas where soils are unsatisfactory for infiltration, there should be surface or piped conveyance to "regional" or "area" management. This could be on a fee basis to support these activities, and at these regional or area management facilities low impact development, detention, and other techniques could be used to clean the stormwater

before infiltration or its use to supplement the hydrology of wetlands and streams.

We know that low impact development is very effective in removing stormwater pollutants. With fair flow credits it will also reduce development costs for stormwater mitigation, provide additional amenities to the development projects and reduce private and public maintenance costs.

Encouragement of its use by consistent standards for design and approval. Assistance in eliminating its use as an "exception" (exceptions take lots of time and money for approval.. "no good deed goes unpunished") in local codes. As these occur, low impact development will become the desired stormwater mitigation strategy for most future development - providing benefits for all interests without requiring mandates.

Currently stormwater mitigation is the single most costly mitigation for development projects. As the Phase II implementation occurs with dramatically great volume and quality mitigation requirements, low impact development is the most cost effective solution for nearly all projects, and the only solution for many projects to be financially viable. Let nature work with us to address stormwater quality issues rather than continuing to work against nature.

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Voluntary or Required

We believe that Low Impact Development should remain a voluntary stormwater

mitigation strategy. Certainly incentivized to encourage its use where appropriate, but should not be required. Low Impact Development practices are not appropriate for all sites. LID practices are important, but only a partial solution to proper stormwater management. Other stormwater techniques such as regional or area management are other parts to the stormwater puzzle. In areas where soils are unsatisfactory for infiltration, there should be surface or piped conveyance to "regional" or "area" management. This could be on a fee basis to support these activities, and at these regional or area management facilities low impact development, detention, and other techniques could be used to clean the stormwater before infiltration or its use to supplement the hydrology of wetlands and streams.

We know that low impact development is very effective in removing stormwater pollutants. With fair flow credits it will also reduce development costs for stormwater mitigation, provide additional amenities to the development projects and reduce private and public maintenance costs.

Encouragement of its use by consistent standards for design and approval. Assistance in eliminating its use as an "exception" (exceptions take lots of time and money for approval.. "no good deed goes unpunished") in local codes. As these occur, low impact development will become the desired stormwater mitigation strategy for most future development - providing benefits for all interests without requiring mandates.

Currently stormwater mitigation is the single most costly mitigation for development projects. As the Phase II implementation occurs with dramatically great volume and quality mitigation requirements, low impact development is the most cost effective solution for nearly all projects, and the only solution for many projects to be financially viable. Let nature work with us to address stormwater quality issues rather than continuing to work against nature.

From: Brad Tower

Date: 05/05/2008

Comment: I would expand upon the comments from the Oil Spill Advisory Council with respect to derelict vessels. We do need to find a way to 'better deal' with derelict vessels, and oil is not the only contaminant that can be kept from the waters of the Sound in doing so.

The difficulty currently is that large vessels must either be
a) dismantled on a large ramp after being stripped to a minimum while still afloat, which the Department of Ecology dislikes due to the possibility that some material

may enter the water during the ship breaking, or
b) dry docked

Dry docking facilities are at a premium for large vessels. To ‘better deal’ with derelict vessels, we either need to find a way to make a dry docking facility available to those contractors who can dismantle and recycle derelict vessels, or find protocols for ship breaking that do not require dry docking and still protect water quality during the process of ship breaking.

I believe that one of these two courses of action should be included as a strategy for protecting water quality.

From: Jacqui Brown-Miller

Date: 05/05/2008

Comment: This Comment is submitted for the Washington Oil Spill Advisory Council. A better formatted and footnoted version of this comment is being submitted to the Partnership via e-mail and is also being placed on the Council's web site at www.governor.wa.gov/osac.

III. (P2) What strategies and actions must be taken to improve water quality and reduce oil-related toxics in Puget Sound?

In general, to achieve a healthy Puget Sound we must eliminate enough oil spills to assure toxic concentrations do not exceed what a healthy ecosystem can support. There are numerous areas of Puget Sound that can tolerate no level of oil pollution--such as shellfish beds, eel grass, and herring spawning areas. Some areas of Puget Sound - industrial areas and areas with considerable flushing-- may be able to withstand some level of oil pollution. However, even for these areas, we are beyond the time when dilution can be the solution to pollution. This will become even truer as populations around Puget Sound increase. We must get a handle on this problem now by taking effective steps to better prevent large catastrophic spills, moderate sized spills, as well as the smaller chronic spills that add up. Also, when spills do occur, we must have a system in place to rapidly assess and clean up spills, particularly moderate to large spills.

Oil spill prevention, response, and remediation programs are in place already--both at the federal and state levels. Many describe these systems as being very good. But there is room to improve and there is much to learn.

Washington State agencies and entities with oil spill responsibilities include:

- o The Spills Program within the Washington Department of Ecology.
- o The Oil Spill Team within the Washington Department of Fish and Wildlife.
- o The Derelict Vessel Program within the Washington Department of Natural Resources.
- o The Oil Spill Advisory Council.
- o The University of Washington Sea Grant Funded Boater and Marina Education program.

The Council finds it to be critical that the Partnership do the following:

1. Include in the Action Agenda the goal of preventing all oil spills, small and large.
2. Include in the Action Agenda the goal of rapidly and effectively responding to oil spills.
3. Bring the state agencies with responsibility for preventing spills and/or effectively responding to spills into the Partnership's accountability structure. This should also include state agencies' cooperative interactions with other entities, including federal agencies, facility operators, oil industries, and transportation industries.

More specifically, the Council recommends considering adopting the following items into the action agenda. These recommendations should result in better prevention of both large and small oil spills.

A. Generally agreed upon additions to state's oil spill program.

In a 2006 report, the Council made the following recommendations for programmatic changes to the oil spill program.

1. Fully fund a year-round dedicated rescue tug at Neah Bay.

The Council recommended permanently stationing a year-round rescue tug at Neah Bay. Rescue tugs are designed to prevent large oil spills from happening when ships find themselves drifting to shore with no power or steering. Since 2006, Washington has made a great deal of progress toward getting a year-round tug at Neah Bay. With Governor Gregoire's support, the Legislature provided year-round funding for the 2008-2009 fiscal year. The funding source is not permanent, however. The State is hoping Congress will create a permanent federal tug funding plan. The Council is hopeful that Congress will come through and that if it does not, the Legislature will find a permanent source of funding for the year-round Neah Bay tug.

2. Identify locations where we may need other rescue tugs and fund them.

The Council recommended creating an Ecology-managed tug fund to place rescue/response tugs in other critical locations on an as-needed basis, such as in a storm. Again, this would be to prevent large spills due to drift groundings. The Legislature has not acted on this recommendation.

3. Better deal with issue of derelict vessels that leak oil.

The Council recommended eliminating the backlog of abandoned and derelict vessels in Washington. This backlog resulted largely from funding to the derelict vessel program being inadequate to handle large, previously commercial, vessels. The goal in eliminating this backlog, and figuring out ways to stop the pipeline of small and large derelict vessels alike, is to reduce the amount of smaller oil spills being dumped into Puget Sound.

The Legislature took critical first steps in 2007 by providing a temporary revenue stream to assist Department of Natural Resources (DNR) with moving through the backlog of derelict vessels, as well as making it easier for local governments and marinas to participate in derelict vessel removal. The Legislature also directed DNR to convene a working group to, among other things, examine new revenue stream options for managing large, previously commercial, vessels. DNR has made considerable progress in this work. The Council is hopeful that the Legislature will act on DNR's recommendations in the 2008 session.

4. Adequately fund the Oil Spill Advisory Council.

The Council serves as a nexus between "oil spill insiders" and the outside citizen world. As Governor Gregoire said, "It's so important. Only if public engagement continues are we going to make sure we don't have complacency [;] The public has to be engaged and involved." To this end, the Legislature tasked the Council with numerous interrelated objectives that include early consultation with government decision makers and providing independent advice, expertise, research, monitoring, and assessment in relation to oil spill prevention, preparedness, and response.

In 2006, one year after its creation, the Council hired an independent consultant to evaluate what the Council would need in order to achieve its mandate. This consultant made the conservative recommendation that the Legislature should fund the Council at \$1.75 million per biennium. The Legislature has not yet acted on this recommendation.

Nonetheless, the Council has proven that it adds considerable value to the state's level of oil spill prevention and preparedness. Through its continued conversation with Ecology over the implementation of the oil transfer and oil spill contingency planning rules, the Council has gained several incremental improvements to oil spill prevention and preparedness. The Council is proud of its work in moving the state to the point where it now funds a year-round tug at Neah Bay. Similarly, the Council is pleased that its work on derelict vessels lead to statutory changes to improve the

derelict vessel program.

Additionally, the Council is in the process of conducting several very important studies that could lead to significant improvements. First, the Council is conducting a study to find out if there are ways to improve Washington's ability to respond to a large-scale spill. Second, the Council is initiating a study to find out if there are programmatic improvements that can be made to intervene early in the error chain before incidents that lead to spills can occur on cargo and tank vessels while they are underway. Doing just these things, however, has stretched the Council's budget and staff to their limits.

Other advisory bodies similar to the Council are funded well beyond the Council's current level of funding. For example, the Prince William Sound Regional Citizens Advisory Council (RCAC) receives biennial funding above \$6 million and the Cook Inlet RCAC is funded at over \$1.6 million biennially. This funding allows them to reach their full capacity as citizen advisory bodies.

Until Washington's Council is funded beyond its current biennial budget of \$715,000, it will be difficult for the Council to effectively conduct the long list of important duties set forth by the Legislature in RCW 90.56.130. For example, the Council has set forth modest goals in its 2007 work plan, but may not be able to achieve all of them due to resource issues. Also, the Council is limited in how much it can expend to conduct important education and outreach, to participate in several key working groups, and in developing expertise and capacity to monitor drills and other important activities.

B. Move forward on a much-needed overhaul to funding for oil spill programs.

In addition, the Council made recommendations for funding that were specific about the source of the revenue collection and the amounts needing to be collected. These are important given the dire straights in which oil spill programs have been placed due to the way Washington funds its oil spill programs.

All oil spill programs in Washington are funded from two taxes charged on crude oil brought to Washington's refineries via vessels. The first tax is a one-cent per barrel tax that feeds the Oil Spill Response Account. When that account reaches \$9 million, the tax turns off. The second tax is a four-cent per barrel tax that feeds the Oil Spill Prevention Account. This account feeds oil spill related programs run by the following entities:

- o The Spills Program within the Washington Department of Ecology.
- o The Oil Spill Team within the Washington Department of Fish and Wildlife.
- o The Derelict Vessel Program within the Washington Department of Natural

Recourses.

- o The Washington Oil Spill Advisory Council.
- o The Oil Spill Prevention Education program at Washington Sea Grant, University of Washington.

Exclusive of any programmatic additions recommended by the Council in its 2006 report, the Council predicted in 2006 that Ecology would have a revenue shortfall of \$1.6 million in the 09-11 biennium. In 2007, Ecology affirmed this shortfall, citing that current level expenditures have risen to exceed revenue. Ecology wrote that the Oil Spill Prevention Account is insolvent and that we are currently mining fund balance carried forward from previous years. The barrel tax that funds the program was not tied to inflation and has not kept pace.

It gets worse. By adding the programmatic additions recommended by the Council in 2006, this revenue shortfall would be about \$6.2 million after 07-09 biennium. With proposed additions for DNR's derelict vessel program, the deficit would grow to \$9.6 million after 07-09 biennium.

To make matters even worse, each year the barrel tax paid on oil exported from the state is refunded. This year, the refund resulted in a hole bigger than \$2 million in the Oil Spill Prevention Account. The Council understands Ecology was faced with having to lay off nineteen people from its oil spill prevention program.

Additionally, other agencies funded from the Oil Spill Prevention Account were also threatened-WDFW and the Oil Spill Advisory Council.

Luckily, the Legislature patched the hole. But next year, this problem will be back as oil companies are refunded the barrel tax paid on oil that is ultimately shipped out of state after being refined. This is a refund for oil that will often be transported by water out of the state-a refund for a second risk being posed to state waters.

There is a clear need for the Legislature to fundamentally change the tax structure-to significantly increase the amount of revenue raised, to assure that the revenue is designed to automatically keep pace with inflation and necessary programmatic augmentation over time, to assure that the system is set up so that refunds from the revenue stream do not continually disrupt programmatic continuity, and to assure that the amount charged (and kept by the state) reflects the risk that is posed to state waters.

In addition, many have argued that the state should consider:

- o Increasing the cap on the Oil Spill Response Account (OSRA) to adequately reflect resources needed by the state when a spill occurs.

- o Allowing the OSRA fund to be more easily opened to pay for small oil spill events.

The Council's 2006 recommendations were in line with these goals. However, the Legislature did not act on the Council's recommended funding sources and amounts. Rather, it asked the Joint Legislative Audit and Review Committee (JLARC) to study the issue further and release a report this fall. In particular, JLARC is to examine funding mechanisms for oil spill prevention and response programs and compare sources of oil spill risk with the funding mechanisms. The Council is hopeful that the Legislature will act in 2008 to fix the quite dire funding situation.

C. Other important elements to spill prevention and rapid assessment and response.

1. Council studies and activities to explore needed improvements.

In addition to the suggestions above in Section III A 4, the Council can play the following role in enhancing Washington's ability to prevent spills, both large and small, and to quickly clean them up when they do happen. The Council is hopeful that the Partnership will support the following work that is geared primarily toward preventing and responding to medium to large spills from mostly industrial sources. More information is available about each of these in the attached two-page handout.

1. Study whether there are ways to make programmatic improvements to address underlying root causes of mishaps that lead to oil spill pollution events.
2. Study whether Washington is ready to effectively and rapidly respond to a large-scale oil spill.
3. Review the use of escort tugs and review manning issues relating to articulated tug and barge systems and integrated tug and barge systems.
4. Determine if current escort tug regulations are sufficient in light of human and other factors that cause oil spills.
5. Study additional rescue/response tugs as risk interventions in key locations.
6. Track and evaluate Ecology's implementation of its new Contingency Planning rule.
7. Track and evaluate Ecology's implementation of its new Oil Transfer rule.
8. Work in conjunction with other relevant groups, in addition to other state agencies, such as the Puget Sound Harbor Safety Committee, the Regional Response Team and Northwest Area Committee, and the Pacific States/ British Columbia Oil Spill Task Force.
9. Examine whether there are ways to improve the oiled wildlife program.
10. Evaluate methods of calculating natural resources damages assessments.
11. Conduct public education around oil spill issues.

2. Education and outreach about oil spill issues to prevent small, chronic spills from

recreational and fishing activities.

With the advent of the Puget Sound Partnership, saving Puget Sound is the topic of the day, year, and decade. The Partnership has a huge educational mandate, which includes public education about oil spills-preventing big spills and small spills, reporting spills, and rapidly assessing and cleaning up spills.

As indicated earlier, we must focus not only on large oil spills, but on small, chronic spills that add up, such as those from fishing vessels, recreational boats, small work boats, and other small vessels. Indeed, for spills of 25 gallons or more, spills from these vessels make up one third of the total volume of oil spilled directly into Washington waters. Yet, this does not include a significant amount of oil that is likely released daily from boats that leak fluids and pump their bilges into the water.

It is likely that many citizens allow oil to enter Washington waters because either they do not understand the cumulative impacts of small oil spills, or they have not been given basic tools and assistance to prevent spills. Additionally, there is perhaps a culture of "it is not my fault and there is nothing I can do to fix it." If success is in its future, the Partnership must work toward changing this culture. The first step is embarking upon a massive educational effort.

There are several organizations that partner to conduct public education around preventing small spills. This was done under the premise that small oil spills can add up to significant environmental and economic harm, and are a regional problem that can be remedied more effectively through collaborative projects drawing from existing talent and resources. The main focal point of this partnership is the Pacific Oil Spill Prevention Education Team, or POSPET, which operates under the sponsorship of the Pacific States/ British Columbia Oil Spill Task Force. Learn more about POSPET at <http://www.oilspilltaskforce.org/pospet.htm>. Local (Washington) participants include the Department of Ecology, Washington Sea Grant, the Puget Sound Keeper Alliance, the Coast Guard Auxiliary, the Oil Spill Advisory Council, city marinas, and more. There are also POSPET participants from British Columbia, Oregon, and California.

A centerpiece of POSPET's effort is the "Spills Aren't Slick" campaign which produces and distributes materials to marinas and other partners across Washington, Oregon, California and British Columbia.

Additionally, those entities that partner in POSPET conduct their own independent education. For example, the Washington Sea Grant is funded to support an outreach position that addresses the recreational boating community and commercial fisherman. Program staff also participates on a steering committee focused on the

development and outreach of Washington's new Clean Marina Program.

Additionally, Ecology distributes public news releases identifying the causes and preventive measures that can be taken to avoid oil spills from recreational and commercial boaters.

The Puget Sound Partnership, with the huge amount of public focus it enjoys, could play a crucial part in this educational partnership by coordinating with and supporting their efforts in Washington.

In addition, Ecology has posited that there are additional tools needing to be developed or funded and provided to state entities that are funded by the Oil Spill Prevention Account. These could enhance POSPET's work. These items include:

- o A small vessel program geared toward recreational and commercial vessels under 300 gross tons. This would include public education/outreach to small vessels and fishing vessels and the recreational boating community. The emphasis would be on preventing spills when refueling, bilge pumping and routine engine maintenance.
- o Develop and implement an educational and outreach strategy to prevent spills similar to the anti-litter or the click-it or ticket programs. This would be geared toward educating industry, commercial fisherman, recreational boaters, and citizens about spills and their impacts to Washington waters.
- o Work to increase participation in the Clean Marina program that was created in 2005 as an expansion of the EnviroStars program.
- o Expand the oil transfer inspection program to Class 4 facilities that transfer fuel and oils to non-recreational vessels that do not hold more than 10,500 gallons.

3. Work with Recreation and Conservation Office and the Washington State Parks to pursue small vessel objectives.

Ecology came up with the idea of coupling educational programs, like those of POSPET, with additional recreational boater education and resources. This would be done through the Washington State Recreation and Conservation Office and Washington State Parks and Recreation Commission. Additional resources geared toward assisting recreational boaters with oil spill prevention could include:

- o Head pump-out stations.
- o Waste oil and bilge water receptacles.
- o New and efficient engine incentives.
- o Business rebates.
- o Exhaust incentives.
- o Fuel filling port design changes.
- o Fuel tank vent design changes.
- o Derelict vessel removal.

4. Increase number of oil and bilge receptacles at ports and marinas; petition for Puget Sound to be a federal "no discharge zone."

Ecology also came up with the idea of working with ports and marinas to establish bilge water and oil reception facilities around Puget Sound. This will likely require grant funds to assist ports and marinas with this work.

In addition to providing these resources, so that boaters have alternatives to polluting Puget Sound, it would be possible for Washington agencies to petition the US Environmental Protection Agency to designate Puget Sound as a "no discharge zone" under 33 USC Sec. 1322 B(2)-(4).

5. Storm water pollution and local point source pollution.

Oil products are part of storm water. The Council supports the Partnership addressing storm water management systems as a whole, rather than peeling off individual groups of toxics to be addressed separately. Of course, the Council recognizes that public education on how to keep oil out of storm drains, along with other toxics, could be enormously beneficial.

It would also be helpful to develop methods that make it easier for emergency responders and law enforcement to track spills back to the source through the storm water collection systems. Ecology came up with the idea to add GIS layers for all storm drain systems that empty to Puget Sound available for responders. It would be necessary to partner with local governments to accomplish this.

In addition, Washington must strengthen efforts to engage those in the community that have the potential to spill oil from point sources when that oil has the potential to be transported to marine waters. Members of the community that meet this description include hydro-electric projects, rail roads, and tanker trucks. This would be something that could be coordinated in conjunction with Ecology's Spills Program and its water quality program.

Ecology has indicated it would like to develop an expanded program to perform spill prevention inspections for oil handling facilities that do not transfer over water, but pose a risk of contaminating waters of the state when spills occur. Apparently, there are almost 5,000 oil handling facilities in Washington that are not regulated by Ecology, but could be.

6. Increase investigations of small spills.

Spills are less likely to occur if there are thorough investigations for those that do happen. This is particularly true if those investigations lead to lessons learned and also lead to penalties that deter future spills. Investigations also serve to educate government and the public about the impacts of spills and, thus, have a preventative future effect.

7. Department of Ecology's oil spill program.

Key to preventing oil spills in Washington waters are the following Ecology programs (this is not an exhaustive list). Assuring that these programs are well-funded and effectively administered is important to assuring the health of Puget Sound. Additionally, however, as indicated below, there are ways to augment these programs.

a) Prevention from vessels and oil-handling facilities

Prevention activities include:

- o Implementing the new oil transfer rule.
- o Boarding vessels to educate and monitor compliance with federal law.
- o Requiring, reviewing and granting approval of operation manuals, prevention plans, and training and certification programs.
- o Maintaining the Neah Bay tug.
- o Implementing protocols from the Memorandum of Agreement with the U.S. Coast Guard.
- o Administering voluntary programs for vessels: Voluntary Best Achievable Practices (VBAP) and Exceptional Compliance Program (ECOPRO).

b) Response preparedness.

Preparedness for rapid spill assessment and response is done through the following:

- o Implementing the new oil spill contingency plans rule.
- o Administration of drills.
- o Distribute spill response equipment to communities.

c) Rapid response.

Assistance with rapid spill assessment and response is done through the following:

- o Maintaining constant spill response capability.
- o Responding to all oil spills from vessels and facilities.
- o Working with Incident Command in the event of a spill.

d) Areas needing further development.

The following items represent areas where support from the Puget Sound Partnership could be vital to achieving augmentations to Ecology's oil spill prevention, preparedness, and response program. These augmentations would enhance prevention and containment of medium to large sized spills:

- o Federal delegation -- Support delegated authority from the U.S. Coast Guard to conduct vessel and facility inspections and conduct reviews of federal oil spill contingency plans.
- o Vessels of opportunity - Assist with identification and designation of vessels (such as fishing vessels) that could be designated to assist with deployment of spill response equipment in the event of a spill. This is in addition to assuring that appropriate industry-funded work boats are designated under the oil spill contingency planning rule.
- o Volunteer responders - Assisting Ecology (and WDFW) with programs to bring pre-trained volunteers into spill response and to more effectively handle convergent volunteers in spill events.
- o Developing green ports - Support Ecology's coordination with public ports to create incentives to discharge waste oil in port.
- o Local response equipment - Help to enhance grant programs for communities and marinas to have spill response equipment on hand.

From: Pete Schroeder

Date: 04/25/2008

Comment: I find what may be an important gap in the April, 2008, initial discussion draft, Water Quality Topic Forum. The sea-surface microlayer (SML) or the air water interface are not mentioned as a source of bacteria, virus and fungi that may be detrimental to water quality, human health and the endangered Southern Resident Killer Whale, and therefore should be monitored for status and trends.

Over 63 species of marine wildlife in the Puget Sound/Georgia Basin marine ecosystem are listed as endangered or are candidates for inclusion on the endangered species list due to declining populations (Brown and Gaydos, 2005). The exact causes of these declines are unknown but likely reflect complex, multifactorial ecologic processes, often culminating in degenerative, infectious or inflammatory processes.

Importance of the SML as a potential source of pathogen exposure and infection in susceptible or debilitated hosts in aquatic environments has been demonstrated

(Franklin et al., 2005, Buck et al., 2006,) and may represent a source of new microorganisms (Agogue et al., 2005). Many at-risk species within Puget Sound/Georgia Basin transit this zone during their normal activities and behaviors, and the pathogen composition, rate of recruitment and possible contribution to morbidity or mortality of susceptible species are largely unknown.

Our current study, under NOAA Permit#965-1821-00 and partially funded by NMFSC-Western Region Statement of Work NFFP7100-7-23894, has identified pathogenic and antibiotic resistant microorganisms in both killer whale breath samples and SML samples during 2006 and 2007 field trials, around the San Juan Islands.

Our 2006 work is published in the 2007 Proceedings, Volume 38, International Association for Aquatic Animal Medicine, Ed. D.W. Stremme, Camden NJ 08103, pp 97-98.

From: Naki Stevens

Date: 04/24/2008

Comment: Initial Draft Comments on Water Quality Issue Paper Including Recommended Management Benchmarks Puget Sound Environmental Caucus April 23, 2008

Note to Reader: This paper represents the preliminary work and initial consensus of the Puget Sound Environmental Caucus to answer questions posed on nutrients, pathogens, and toxics in the Puget Sound Partnership's "Initial Discussion Draft Water Quality Topic Forum," April 14, 2008. The key element of our comment paper is recommended management benchmarks for each pollutant "pathway" to the Sound. By law, the Action Agenda is to include measurable benchmarks, and we focused more of our work on identifying which benchmarks would be most effective in producing results than we did on the status and threats questions.

The management benchmarks in this paper are the equivalent of the Topic Forum Water Quality Paper recommendations listed in Policy Question 2: "Strategies to Improve Water Quality in Puget Sound." We recognize that the PSP water quality paper is an initial discussion draft. Our overarching comment is that the management

benchmarks in our paper be considered by the Partnership for inclusion in the next draft of the Water Quality Topic Forum Issue Paper, the Synthesis Paper, and the 2020 Action Agenda.

The Caucus Water Quality Committee will be refining this paper into a more finished product to submit to the Partnership prior to the Synthesis Workshop on May 28, 2008. We have also prepared a preliminary comment letter on the Topic Forum Discussion Draft, and that is appended at the end of this document.

Water Quality Overview

Preventing contaminants (toxics, nutrients, pharmaceuticals, and pathogens) from entering Puget Sound must be our highest priority for restoring water quality in Puget Sound. Source control and prevention are the most critical actions we can take to restore the health of Puget Sound, and we need to reverse current spending priorities to place a much greater emphasis on prevention. The largest and most critical sources of pollutants to the Sound must be addressed first. Cleanup of legacy toxics must also continue, but clean-up efforts alone are inadequate to restore Puget Sound to health.

Existing laws should be fully implemented and existing regulations must be fully enforced, but additional measures are needed to adequately address water quality threats. All sources of pollutants in the Puget Sound basin - from individuals, businesses, industries, and governments- - must be identified, monitored, and reduced.

Significantly increased investments are needed for implementing current laws and meeting existing standards, as well as for new approaches to water quality sampling (for example, caged mussels, harbor seal blood chemistry) and new technologies for treatment and source control. New investments will also be needed for the behavioral changes that are necessary to accomplish our water quality goals in Puget Sound. Education, technical assistance, research and development, and regulation are needed to replace harmful processes and practices with sustainable practices that restore and protect water quality.

I. Nutrients (Nitrogen/Phosphate)

I.A. What is a healthy Sound?

Water quality standards for dissolved oxygen are met throughout Puget Sound Region and there is no impairment of biological or human uses.

Examples of key indicators: No eutrophication in streams, rivers, lakes or enclosed bays; dissolved oxygen standards achieved in Hood Canal, South Sound, lakes, and other areas currently impacted.

I.B. What is current status of Puget Sound's Health and what are the biggest threats?

Status: Hood Canal, Quartermaster Harbor, Penn Cove, Henderson Inlet and Budd Inlet are among the Sound's impaired waterbodies. Some enclosed bays are close to impaired. Some rivers, creeks and lakes are under threat. Of the 237 impaired waters for low dissolved oxygen, only 11% had approved cleanup processes in place (2007 State of the Sound). Current stormwater programs and permits are inadequate to protect either water quality or ecosystem health. Many local jurisdictions have little in the way of stormwater programs and fewer still have integrated land use planning with water quality objectives. There is little or no monitoring of agricultural waste, boater waste, and other important sources. Septic system laws are unevenly implemented. Aging treatment plants need retrofits to meet water quality objectives, and CSO's remain a serious concern. Enforcement of laws is weak to non-existent in many areas.

Threats: Septic systems, sewage treatment plants, combined and sanitary sewer overflows, animal waste, boater and cruise ship waste, fertilizer runoff, and stormwater

I.C. Nutrients Action Plan: What actions must be taken that will move us from where we are today toward a healthy Puget Sound?

MANAGEMENT BENCHMARKS FOR EACH NUTRIENT PATHWAY BY 2020:

Sewage treatment plants and industrial wastewater:

- . Significant resources and incentives are used for prevention and source control. .
- . Cap total pollutant loads in wastewater discharges at 2008 levels and put plants on a strict reduction schedule. Most STPs bypass treatment now when it rains too much due to infiltration and inflow issues. We need to build the infrastructure to reuse reclaimed water.
- . Institute advanced water reclamation at all sewage treatment facilities and industrial dischargers; develop requirements and incentives to use reclaimed water.
- . Upgrade, where needed, small and medium-sized sewage treatment plants that are

poorly functioning due to old infrastructure or out-of-date technology.

- . Amend Memorandum of Understanding, incorporating it into berthing agreement with the Port, between NW Cruise Ship Association, Ecology and Port of Seattle to voluntarily prohibit discharges between Elliot Bay and Admiralty Inlet, and have sewage sludge offloaded at the Port of Seattle.

- . Require advanced treatment such as denitrification, membrane technology or other technologies, in areas where we have existing or emerging dissolved oxygen problems

Septics:

- . Failing septic systems have been identified and corrected in key marine areas by 2012 in the 12 Puget Sound counties. Fully fund HB 1438 to allow local governments to implement their septic system correction plans.

- . Pass legislation to require new and replaced septic systems to treat for nitrogen removal where dissolved oxygen is an issue.

- . Where appropriate individual on-site septic systems have been replaced by sewer lines and community septic systems.

Waste from Vessels:

- . All marinas have well maintained pump-out stations. Pump-outs are well distributed throughout Puget Sound.

- . Puget Sound is designated as a vessel No-Discharge Zone.

- . Boater education and compliance programs are expanded.

- . Cruise ship sewage sludge offloading and disposal facilities are provided for cruise ships at Port Terminals.

Surface Runoff

Animal waste:

- . All farms, including hobby farms, with potential water quality problems are identified and required to develop and implement farm plans that will ensure compliance with water quality objectives.

- . Net pens are carefully monitored to ensure compliance with water quality standards;
- . Animal waste-related ambient and onsite monitoring programs are expanded to ensure farms are in compliance with water quality objectives.
- . Pet waste programs are developed and enforced throughout the Puget Sound region.

Fertilizer:

- . Agricultural use of fertilizers is monitored and ensured to be protective of water quality objectives. Best management practices are reviewed and updated as necessary.
- . Homeowner and gardener education programs are significantly improved using behavior modification techniques.
- . Restrictions on use of fertilizers are put into place in buffers along Puget Sound shorelines, creek, river and lake riparian areas.

Stormwater:

[Note: to avoid redundancy, this section is written to address all pollutants found in stormwater].

Municipal permits

- . Expand geographic coverage of municipal stormwater permits to include all 12 Puget Sound Counties.
- . Develop requirements that ensure that local stormwater programs meet or exceed water quality standards and ecosystem needs.
- . Require mandatory basin planning to identify opportunities and correct problems in each subbasin.
- . Integrate water quality objectives into land use planning decision-making. Conduct full build- out analysis of water quality impacts associated with planned development.
- . Require mandatory Low Impact Development for all new development and redevelopment.

- . Incorporate new source control programs, including incentives, to address persistent toxic pollutants, fertilizers, and other pollutants commonly found in stormwater.
- . Require identification and protection and restoration of urban forests, soils, and other features of the landscape that are critical in the natural hydrologic cycle.
- . Establish a major retrofit program to begin addressing stormwater problems associated with existing development.
- . Establish a regional monitoring system to track both environmental impacts as well as program effectiveness. This program should be linked to an adaptive management system.
- . Eliminate CSOs, primarily by increasing onsite retention and infiltration.

Industrial

- . Insure that industrial sites, cleanup sites, and other areas of concentrated contamination are controlled and that runoff does not violate water quality standards. (Stormwater permits currently do not regulate the discharge of nutrients except for total phosphorus, nitrate/nitrite from SIC codes 28xx and 20xx - Chemical and Allied Products, Food and Kindred Products, in the industrial permit.)

All stormwater permits

- . Create a major new funding source to address these needs.

All Pathways

See funding, assessment and regulatory sections at the end of this document.

I.D. Where Should We Start?

Funding - Placeholder

See management benchmarks.

II. Pathogens

II.A. What is a healthy Sound?

Pathogens that cause disease or illness to host animals and plants do not impair human health and the Puget Sound food web.

Examples of key indicators: Historic shellfish beds closed due to sewage and animal waste are reopened when free of toxins; water quality standards for fecal coliform

and enterococcus are met throughout Puget Sound, shellfish or fish die-offs, swimming beach closures are rare.

II.B. What is current status of Puget Sound's Health and what are the biggest threats?

Shellfish closures throughout the Sound are frequent (nearly 30,000 acres are closed at any one time), but fecal coliform is a poor measure. Inadequate sampling occurs to determine extent of problem.

Release of untreated sewage into Puget Sound waterways is a major source of pathogens. Pathways include, run off or output from inadequate sewage treatment plants, including cruise ship mishaps (rare), untreated combined sewer overflows, or septic systems, and direct release into an open body of water from farm land (land animals, farmed animals, or crops). Biosolids spread on farmland and in gardens are another potential source for how pathogens from sewage recycle into ground water, then surface water or directly to surface water.

Stormwater and wash-out from storm drains can carry pathogens into the Sound, contaminating swimming beaches and shellfish beds.

II.C. Pathogens Action Plan: What actions must be taken that will move us from where we are today toward a healthy Puget Sound?

MANAGEMENT BENCHMARKS FOR EACH PATHOGENS PATHWAY BY 2020:

For all pathways, See Section IC. Nutrients Action Plan. In addition to the management benchmarks identified in the Nutrients section, the following strategies are required:

. Counties should keep records of pathogenic bacteria caused infections and Department of Health should collect and publish these annually and take steps to reduce these.

In addition:

Sewage:

. Application of sludge to land surfaces is only allowed when it is proven to have no pathogens, prions, viruses, harmful bacteria, pharmaceuticals, and other contents harmful to soil, wildlife and humans.

Drinking Water:

By 2010, all drinking water systems and sewage treatment plants should be upgraded to test for all pathogens, medicinals, viruses, and infectious particles including prions, and emerging contaminants.

Stormwater: see Stormwater Action Steps under Section III.C. Nutrients and Section II.C. Toxics

II.D. Where should we start?

Funding - Placeholder

See Management Benchmarks for Nutrients and Pathogens.

III. Toxics

III.A. What is a healthy Sound?

Toxic chemicals in Puget Sound and sources are reduced to a level where food web populations thrive and human health and well-being is protected.

Examples of key indicators:., blood samples collected from harbor seals around the Sound are not full of toxins, fish/shellfish is safe to eat, swimming and recreation is safe, fish populations are healthy and sustainable, air quality in key areas no longer is a chronic health threat, bioaccumulation tissue tests (caged mussels or similar).

III.B. What is current status of Puget Sound's Health and what are the biggest threats?

Toxic chemicals, both legacy and from new and ongoing sources, impair wildlife and human health throughout Puget Sound basin, especially in urban bays and segments of certain rivers. Current approaches to addressing toxic chemicals in the Puget Sound basin do not adequately address source control - at a regulatory or a funding level. Navigational dredging is occurring within Superfund sites but outside of Superfund guidelines. Experts believe that many contaminated sites have not yet been identified, let alone cleaned up. Areas that have been cleaned up are being recontaminated by stormwater and other sources of pollution.

The state legislature has established a "Zero Spills" policy for Washington, but state and federal programs need many improvements before we can claim that we have done all that we can do to achieve that goal. Strengthened programs are needed in oil spill prevention, preparedness, and response.

III.C. Toxics Action Plan: What actions must be taken that will move us from where we are today toward a healthy Puget Sound?

MANAGEMENT BENCHMARKS FOR EACH TOXICS PATHWAY BY 2020:

Toxics Source Control:

- . Improving Toxics Use Reporting: Ecology must improve the public's right-to-know and improve agency knowledge of toxic chemical loading by requiring priority pollutant scans for all NPDES individual permittees and by establishing lower thresholds (20% of EPA requirements) for toxics reporting by chemical user/emitter facilities in the Puget Sound basin and for air discharges authorized by the Puget Sound and the Olympic Regional Clean Air Agencies and the WA State Department of Ecology.

- . Eliminating all sources of persistent bioaccumulative toxics on Ecology's PBT list in accordance with the state's PBT Strategy.

- . Requiring companies to choose the safest chemicals for their consumer products to protect humans and wildlife.

- . Complete at least seven chemical action plans under Ecology's PBT program.

- . Reform existing laws and regulations to require companies to use the safest chemicals when producing consumer products and to capture and recycle all source effluents.

Sewage treatment plants and industrial wastewater:

- . Pretreatment programs are significantly strengthened.

- . Significant resources and incentives are used for prevention and source control. Cap discharges of toxics at current levels.

- . Phase out mixing zones for persistent bioaccumulative toxics in discharge permits.

- . Reduce the size of mixing zones for other toxic chemicals.

- . Address pharmaceuticals and other emerging chemical contaminants.

- . Adopt water quality standards and requiring AKART to remove toxic chemicals from discharges.

- . Implement programs that detox and minimize sludge and landfill what is left.

- . Adjust permit fees to recover full cost of implementing NPDES permit program.

- . Reduce dependence on general permits and move towards individual permits where appropriate to better control pollutants
- . Conduct compliance monitoring more frequently to ensure compliance with permits.

Marine Vessel/Boater:

- . Review recommendations made in EPA's 2007 Draft Cruise Ship Discharge Assessment Report for potential inclusion in MOU or recommendations to Congress.
- . Enact a discharge ban in Puget Sound to reduce potential for toxics release.
- . Require the use of non-PBT boat paints.
- . Address oily wastes.
- . Increase education programs for bilge water and small spills issues.

In-water:

- . Complete creosote pilings removal and replacement program
- #### Surface Runoff

Nonpoint Source Pollution

- . Nonpoint source pollution has a significant impact on water quality in the Puget Sound region. While source control and similar measures are important to protecting the Sound, the Department of Ecology has tools available to prevent and enforce against nonpoint source polluters. For example, the State water quality regulations give the Department of Ecology the authority to prevent degradation of high quality water sources and to enforce against point and nonpoint source polluters through an "Outstanding Resource Water" or "Tier III" designation under WAC 173-201A-330.

Agriculture

- . Address pesticide runoff and overspray.
- . Reduce runoff of fertilizers to ensure compliance with water quality standards.
- . Remove toxic contaminants in sludge used for spreading, with focus on source control.

Stormwater: see Section IC. Nutrients Action Plan. In addition to the management benchmarks in the Nutrients section, the following strategies should be employed::

- . Non-toxic building and surfacing materials are required and incentivized.
- . Focus on pollution prevention including product bans - copper brake pads, zinc in tires, coat zinc fences and roofs, etc.
- . Require all permit holders, including stormwater permit holders, to comply with water quality standards and phase out mixing zones for PBTs and dissolved metals.
- . Prioritize the development of low cost, effective stormwater treatment technologies that have been independently tested by third parties.

Air (mobile and fixed):

- . Enhance both ambient monitoring and monitoring of individual sources of these pollutants and address cumulative impacts.
- . Significant resources and incentives are used for prevention and source control.
- . Reduce loads from air sources.
- . Improve and assure implementation and enforcement of the NW Ports Clean Air Strategy, including removal of the loophole that currently allows cruise ships to use high sulfur fuels.
- . Support the US Marine Vessels Emissions Reduction Act (S. 1499).
- . Encourage Washington State Ferries to invest in clean air technology for their new ferries.
- . Air operating permits should mandate capture and recycling of pollutants and elimination of mal odors from toxic sites by 2012.

Contaminated sediments:

- . Accelerate toxic sediment site identification and cleanup, with all sites cleaned up by 2020.
- . Identify and cleanup all upland toxic sites within a quarter mile of Puget Sound by 2020.
- . Require the use local tribal seafood consumption rates for risk assessment.
- . Accurately determine "area background" for sites that don't assume less than full source control.

- . Require "Superfund level" sampling for navigational dredging projects in or adjacent to Superfund sites.
- . Fully implement source control for all cleanup sites.
- . Improve dredge management program to include bioaccumulation and cumulative effects.
- . Utilize opportunities to clean up sediments during navigational dredging.
- . Develop a regional treatment facility and ensure that treatment is a preferred cleanup technique for all Puget Sound cleanup actions.

Groundwater:

- . Investigate and address all sources that are contaminating ground waters that flow into surface water in the Puget Sound basin.
- . Ensure all landfills have high quality leachate capture systems that protect local ground and surface waters from contaminants.
- . Determine where landfills are leaking into groundwaters that eventually access the Sound.
- . Determine where toxicity of landfill stormwater is running off site into streams that empty into the Sound and, where toxic, develop other means of capturing this stormwater.

Oil Spills:

Prevention:

- . Require a year round rescue tug at Neah Bay.
- . Require standby tugs in other locations such as the San Juan Islands if the need is demonstrated.
- . Maintain and expand state and federal tug escort requirements, including escorts for tank barges, refined product tankers and double hull crude tankers in Puget Sound.
- . Limit tanker and ship transfer operations in severe weather.
- . Expand and strengthen state and federal inspection programs.

- . Strengthen federal requirements on crew work hours, drug and alcohol testing, and manning requirements.
- . Strengthen federal requirements on vessel design, equipment, and maintenance.
- . Institute prevention planning for all vessels entering Washington waters.
- . Update the vessel traffic agreement between the US and the Canadian Coast Guard to insure reciprocal regulations across the boarder.
- . Maintain Magnuson Act protections involving refinery dock expansion.
- . Assure that the work plan developed between the State and Coast Guard MOU is completed.

Preparedness and Response:

- . Require that new Oil Spill Contingency Plans be tested with a series of no-notice drills in a variety of weather conditions.
- . Require that Contingency Plans show that adequate gear and personnel are available to address spills in a timely manner in a variety of weather conditions and for worst-case scenarios.
- . Ensure that Contingency Plans identify recovery systems likely to be used in the event of a spill.
- . Adopt a federal Salvage and Firefighting Rule.
- . Expand Cherry Point Vessel Traffic Risk Assessment to include an evaluation of risks posed by all vessels and appropriate measures to mitigate those risks.
- . Geographic Response Plans are updated and additional equipment is prepositioned to implement them.
- . Require the stockpiling of "current buster" boom and improve the level of skimming and storage capacity in the San Juan Islands.
- . Develop a dispersant use matrix accounting for seasonal occurrence of larval organisms for all waters in which dispersant use is permitted.
- . High volume port line is moved from Port Angeles to Neah Bay.

Governance and Funding:

- . Expand funding for state oil spill programs. Current funding sources are inadequate to meet current needs, let alone achieve a "Zero Spills" objective.

- . Ensure public involvement in the development of new programs. The state Oil Spill Advisory Council plays an important role in this area. A dedicated funding source should be identified to continue the work of the Council.

III.D. Where should we start?

Funding - placeholder.

See management benchmarks

ASSESSMENT, MONITORING, STANDARDS AND ANTIDegradation

Issue: need to address bioaccumulation and biomagnification and include a focus on long-term chronic sublethal effects rather than just acute lethal effects:

Standards

- . Water quality and sediment standards need to be updated to address PBTs, freshwater sediments, chronic impacts, emerging contaminants such as phthalates, and simply to reflect current understanding of ecosystem and human health concerns.

- . Develop water quality standards for nitrogen for all marine waters

Assessment

- . Implement a coordinated regional monitoring program linked to adaptive management program

- . Expand caged shellfish monitoring program for the entire Puget Sound basin to more geographic coverage and to include toxic chemicals (marine and fresh water)

- . Expansion of harbor seal blood chemistry monitoring program with particular attention to areas adjacent to large industrial and municipal discharges

- . Expand and improve Puget Sound-wide air toxics monitoring network

- . Improve sludge monitoring program to include priority pollutants and emerging chemicals

- . Expand animal waste-related ambient and onsite monitoring programs to ensure farms are in compliance with water quality objectives.

- . Require wastewater dischargers to monitor outfall areas for impacts from and bioaccumulation of toxic chemicals, including pharmaceuticals, in aquatic species
- . Institute chronic bioassays for contaminated sediment (rather than just acute)
- . Update monitoring for sewage treatment plants should to include all pathogens, pharmaceuticals, viruses, and infectious particles including prions, and emerging contaminants.
- . Ensure adequate groundwater monitoring wells around landfills and hazardous waste sites
- . Improve air deposition load assessments. Quantify the aerial discharge of zinc, copper, lead and other metals that are ending up in stormwater.
- . Establish Osprey egg monitoring network (or other appropriate bird species)

Antidegradation

- . Implement, monitor, and enforce antidegradation regulations to prevent unnecessary degradation of lakes, rivers, wetlands, and marine waters
- . Designate high quality surface waters as an outstanding resource water (a.k.a. Tier III water under WAC 173.201A.330) to proactively protect remaining high quality waters and high priority aquatic habitat

ADDITIONAL REGULATORY FIXES

Examples

- . Full implementation of existing major laws such (Clean Water Act, Clean Air Act, ESA, GMA, SMA, etc.)
 - o Need to address cumulative effects
 - o Need to address smaller sources
- . Vesting Law is needed. WA State has among the weakest laws in the nation.
- . Require low to zero impact development standards be instituted Soundwide immediately.
- . Enhance Ecology's TMDL program to ensure that TMDLs actually correct problems in a timely fashion. Implementation Plans should provide specific requirements for regulatory programs and adaptive management schemes if

necessary to meet loading requirements in a timely fashion. Timeframes for compliance with plans should be clearly delineated. TMDL's should be based on best available science. A complete review of the program is necessary to determine whether these objectives and others are being met.

. Require "financial assurity" at agencies for polluting industrial facilities.

. Update DMMP protocols for PCBs and other PBTs.

Comments on "Initial Discussion Draft Water Quality Topic Forum"
Puget Sound Environmental Caucus, Water Quality Committee, April 23, 2008

The Puget Sound Environmental Caucus appreciates the work that went into the "Initial Discussion Draft Water Quality Topic Forum" paper. Our comments are meant to assist the authors flesh out the paper with additional information from the large body of work that has been undertaken over 30 years to understand and solve the many water quality problems that threaten Puget Sound.

The PSP paper contains a number of important recommendations. We commend the authors, for example, for their understanding that current water quality standards may not be protective enough, especially in the area of toxics, and that the standards should be evaluated in this light. The paper also provides good recommendations on the need to develop a stronger linkage between land use planning and water quality. We support the recommended near-term strategies, and many of them are indeed priorities, such as of retrofits of impervious surfaces and the general recommendations regarding on-site septic systems.

Having said that, we have many concerns with the paper, not the least of which is the overall format for the document, which leads to redundancies and makes it difficult to follow. Water quality is an enormous issue and probably would have benefited from being separated into several different issue papers. It was difficult, we are sure, to address all the issues in one paper.

More important that format challenges, however, we found major gaps in the analysis, conclusions, and recommendations. In numerous important areas, important sources of pollution and the current regulatory programs associated with them are not identified and described. There are few, if any, recommendations for improvement in these areas, many of which are enumerated below.

Obviously, simply filling the gaps will not enough if the goal is to restore the Sound to health by 2020. The paper should recommend important new strategies for improving the health of Puget Sound. We have recommendations for new strategies

on all the gaps we have identified that we hope will be incorporated in the next draft. These recommendations are the management benchmarks in the Caucus water quality paper. In addition, we will be providing more detailed comments regarding specific recommendations in these and other areas in advance of the May 28, 2008 synthesis workshop.

Major Gaps in PSP Water Quality Issue Paper

1. The "Limitations of existing programs" section (beginning on page 22) ignores the four major problems of (a) lack of full funding, implementation and enforcement of existing federal, state and local regulatory programs; (b) lack of adequately protective permit language and clean up plans; (c) lack of political will and attention to existing institutional barriers, public outreach and education by governments, including the legislature; and (d) an over-reliance on mitigation, which several local studies have shown to fail more often than succeed.

2. Lack of recommendations for stormwater LID (low impact development standards). While LID is addressed on page 17, instituting LID Soundwide is not included in the recommendations section of the paper. LID is widely accepted among experts in Puget Sound water quality as the most important strategy for solving stormwater problems in the region. King County and several other jurisdictions around the Sound have adopted LID. The 2007-09 Puget Sound Conservation and Recovery Plan states, "To protect Puget Sound, state and local governments and increasing numbers of developers are placing greater emphasis on innovative low impact development (LID) practices and other cost-effective solutions for new development, and on retrofitting outdated stormwater facilities" (page 21). The state of Maryland passed legislation several years ago mandating LID, and research on other jurisdictions taking this approach would be very useful. Instead, the paper suggests that LID is an unproven strategy (page 17, lines 11-12) that and we should stick to the "the known" strategies (page 28, last 2 bullets), which would imply we simply continue use of retention pond and other BMP's which are "known." Unfortunately, the reality is that they are known to be ineffective. The single most effective and necessary strategy going forward is to institute the use of low impact development standards immediately Soundwide, and this clearly should be included in the paper's recommendations as a top priority.

3. Lack of analysis and detailed recommendations on agricultural waste. While this is clearly a major source of pollution in the Puget Sound basin, the paper includes only brief references to agricultural waste issues, and includes only a general recommendation. The 2007-09 Puget Sound Conservation and Recovery Plan states on page 27, "Livestock and pet wastes contribute to nutrient and pathogen pollution when they are not properly managed. Some commercial livestock operations are

covered under the state dairy nutrient management program or the water quality permit program. Thousands of small-acreage operations are not regulated and may lack effective waste management practices. In addition, fertilizers that are applied in agriculture, forestry, or landscaping includes nutrients that are carried to streams and marine waters in surface and stormwater runoff. Some nutrients infiltrate to reach groundwater and can impair drinking water supplies." The state Department of Ecology has developed a CAFO NPDES permit, which is administered by the state Department of Agriculture. Conservation Districts also play a role, providing technical assistance in this area.

4. Lack of analysis and recommendations on oil spills. There is reference to the need for "funding" for the rescue tug, but no real analysis of the current regulatory system and areas that require improvement. Both Ecology and the Oil Spill Advisory Council have developed a great many materials on the effects of oil spills on Puget Sound and on spill prevention, preparedness and response programs, as well as the changes that must be instituted to strengthen them. The Coast Guard also has authority in these areas.

5. Lack of analysis and recommendations on other boater related wastes. The paper recognizes boater waste as a problem and describes the cruise ship MOU, but the treatment is limited, and there are no recommendations. The paper seems to suggest that we know nothing about ballast water discharge, which is incorrect. The state Department of Fish and Wildlife administers a program in this area and has conducted a fair amount of monitoring over the years. Boater-related waste represents a significant problem to the marine waters of the Sound. Washington State Parks administers a program in this area as well and the Washington Recreation and Conservation Office has done extensive work in this area as well. EPA has materials on line that may be of benefit.

6. No real analysis and recommendations on industrial sources of pollution. The paper seems to suggest that we have "solved" the problem of industrial pollution and that the real issue is cleanup of contaminated sediments, which is primarily a legacy of historical mismanagement of these sources (see p. 11, Industrial and Commercial Practices). Mixing zones, for example, are not addressed other than being identified under wastewater treatment section as an area for which the authors seek more information. The paper should provide a much more detailed analysis of the range of sources and how they are managed under NPDES permits.

7. Water quality problems stemming from contaminated sediment problems are addressed in one of two ways in the paper: 1) there are very few sites that violate standards; therefore, presumably, the problem is really not that serious (see p. 6, sediment quality); or 2) we really don't have a good understanding of these issues

and we need to revise the standards, which currently may not be adequate to protect ecosystems (see p.32, evaluate the role of sediment in water quality issues). We agree, to some extent, with the second statement, but there should be a complete description of the regulatory programs and areas that require improvement. Both the 2007-09 Puget Sound Conservation and Recovery Plan and Ecology's website address contaminated sediments in detail. Any review in this area should contain a description of the sediment standards, relationship to source control programs, and extensive description of both MTCA and CERCLA, and issues associated with dredging at a minimum.

8. Lack of recommendations on air deposition from land and marine-based sources. While the document identifies air borne pollution as an issue, it contains no information on regulatory and other programs, such as "Green Port" initiative and controls on vessel emissions.

9. Lack of attention to the tool of Outstanding Resources Water, in the federal (and state) Clean Water Act, which can be used effectively to prevent degradation of currently pristine waters.

From: Phil Cohen

Date: 04/23/2008

Comment: While LID may not be the silver bullet that solves the urban stormwater quality issues, I would like to think it has its place in the relatively sparse "toolbox" that comes with stormwater management, particularly in regard to urban site retrofits. I also see a need filled in the spring, summer, and fall seasons when considering the small precip events that have the potential for being captured. I'd like to see the PSP work toward getting us public work engineers good, solid, biddable contract language for LID installations. We could then provide LID installations suitable for additional monitoring if that's what is needed for greater acceptance by the stormwater science professionals and the policy makers they advise.

From: Gary Minton

Date: 04/22/2008

Comment: The discussion at the bottom of page 16 on structural BMPs: The use of summations from the International Data Base (Geosyntec and Wright Engineers, Inc., 2007) is unfortunate and without technical merit. Totally inappropriate. For several reasons:

- first, the Data Base does not necessarily contain all appropriate studies;
- it contains many old studies in which the facilities that were evaluated were not

designed according to good design criteria.. some were not designed as treatment systems per se .. e.g. testing a small urban lake perceiving it to be a treatment pond

- a total mish mash of design criteria for any given system type
- in some cases the data base has had a facility placed in the wrong group.. e.g. a filter grouped with swirl concentrators - perhaps these have been corrected by now
- if a group of one type of treatment systems generates negative efficiencies.. we should not be parroting the information.. rather.. we should ask the simple question "why is negative removal occurring"

The proper approach is to be selective and judicious in the use of information available in the data base. To consider the relationship between design criteria and performance for each type of treatment system... and from this information identify the performance that is likely to occur given the design criteria used in our local manuals.. while also considering that many of our design criteria require updating to more cost effective criteria.. based in part from what one can learn from carefully examining the International Data Base.

As for LID.. the term "limited research" appears pejorative. Concur with Curtis on this one. Implies we have insufficient information to move forward with these design concepts. In point of fact with respect to any topic in stormwater.. no matter the aspect...research is limited.. There is sufficient information to move forward with LID while recognizing that as with any treatment system it has its limitations and that we always need to need to learn more.

Bottom of Page 19 ... "Measured effectiveness of stormwater retrofit approaches that ensure contaminants are effectively removed or contained and not inadvertently transferred to groundwater." What is the author implying? That if groundwater quality is changed than we should not infiltrate stormwater? If so, we should apply the same logic to streams, lakes etc, i.e. we should not discharge to surface waters if that results in changing the water quality of those water bodies. Why is groundwater commonly perceived as untouchable when surface waters are not? It is a simple reality that to protect our surface waters from direct discharge of pollutants as well as maintenance of summer flows we must infiltrate stormwater. We need to view the entire hydrologic cycle. Our goal is for new developments to mimic as closely as possible the predeveloped hydrologic cycle; our goal with existing development is to retrofit to alter the current hydrologic cycle back towards the predeveloped condition, while taking appropriate measures to minimize the impact on the water quality of both ground and surface waters with equal consideration to both. This strategy necessitates true source control.. e.g. getting copper out of brake pads, stop using exposed galvanized zinc surfaces, no copper downspouts, street and parking lot sweeping, etc. etc.

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our sound, our community, our chance

From: Art Castle

Date: 04/21/2008

Comment: I endorse the comments made by Curtis Hinman regarding low impact development and the water quality draft reports lack of accurate information. I endorse Mr. Hinman's comments below.

In progress is the development of the Puget Sound Partnership Topic Forum papers. The issue of stormwater is incorporated in the Water Quality Topic Forum. These are important papers that will guide future management and resource allocation for Puget Sound protection and conservation efforts.

We are all aware that land development and stormwater is one of the primary drivers (if not the primary driver) for marine and fresh water degradation. And we know that slowing and reversing that trend will require actions on many fronts including regional/watershed planning, transportation systems, education, and better site scale design and implementation.

I am stating what you already know to emphasize an omission in the Water Quality Topic Forum that can only be characterized as a spectacular omission. Low impact development provides one of the best design and implementation strategies for the site level. Better design, and water quality and quantity management at the site level is necessary to realize goals at the watershed scale.

Amazingly LID has been completely omitted from the Water Quality Topic Forum paper. Below is essentially all that is mentioned about LID:

“Low Impact Development methods: Low impact development techniques for stormwater management include the installation of features that attempt to mimic natural hydrologic conditions, such as porous pavement, infiltration facilities, rain gardens, and other techniques (Puget Sound Action Team, 2005). Limited research has been conducted on the effectiveness of low impact development techniques to improve water quality.”

That's it! Arguably the best set of tools we have for managing stormwater at the site scale is omitted from a document that is central to policy and action development.

April 25 is the last Water Quality Topic Forum meeting (Seattle) where there is opportunity for input. I believe the information gathering process ends early May.

I will be providing over 70 research papers on water quality and permeable paving (this is a short list of research on the subject) to the Partnership on Friday and by

June will have well over a hundred other research papers to provide on permeable paving and bioretention. The International LID Conference in Seattle this November received 210 abstracts. There is certainly more research needed in the field of LID; however, there is now a substantial and growing body of knowledge to support sound implementation.

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We are all aware that land development and stormwater is one of the primary drivers (if not the primary driver) for marine and fresh water degradation. And we know that slowing and reversing that trend will require actions on many fronts including regional/watershed planning, transportation systems, education, and better site scale design and implementation.

I am stating what you already know to emphasize an omission in the Water Quality Topic Forum that can only be characterized as a spectacular omission. Low impact development provides one of the best design and implementation strategies for the site level. Better design, and water quality and quantity management at the site level is necessary to realize goals at the watershed scale.

Amazingly LID has been completely omitted from the Water Quality Topic Forum paper. Below is essentially all that is mentioned about LID:

"Low Impact Development methods: Low impact development techniques for stormwater management include the installation of features that attempt to mimic natural hydrologic conditions, such as porous pavement, infiltration facilities, rain gardens, and other techniques (Puget Sound Action Team, 2005). Limited research has been conducted on the effectiveness of low impact development techniques to improve water quality."

That's it! Arguably the best set of tools we have for managing stormwater at the site scale is omitted from a document that is central to policy and action development.

April 25 is the last Water Quality Topic Forum meeting (Seattle) where there is opportunity for input. I believe the information gathering process ends early May.

I will be providing over 70 research papers on water quality and permeable paving (this is a short list of research on the subject) to the Partnership on Friday and by June will have well over a hundred other research papers to provide on permeable paving and bioretention. The International LID Conference in Seattle this November received 210 abstracts. There is certainly more research needed in the field of LID; however, there is now a substantial and growing body of knowledge to support sound implementation.

From: Art Castle

Date: 04/21/2008

Comment: Art Castle said:

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sound implementation.

From: Roger Erickson

Date: 04/21/2008

Comment: I think that there is an opportunity for "low impact development" in a revision of the current wastewater project by the City of Gig Harbor. It would be a convenient pilot study.

For example:there is a de facto moratorium on development the hiatus may be useful to discuss options other than the dumping of the waste from sewers and storm water into the Harbor or into the north bound current of the Colvos Passage Preserve. (dilution solution)

But there is a chance to create a more natural relationship to the ecology of the sound and watershed. Too often we create large projects that subtract from or add too much food to natural systems and damage our health. Here are some suggestions so we can together prosper naturally.

First, please consider conservation of water as an entry point strategy to reducing the out flow into the harbor. This strategy would also reduce the stress on the unknown amount of groundwater or the aquifers and wells. Some cities have been able to reduce consumption considerably. (25% to 35%) This would give us time to create a more healthy system and still allow for the intelligent improvement of the next environmentally sound step.

Secondly, consider tertiary treatment to reduce the damage to the marine and shoreline environment and ultimately to part of the human food system. This could be done with a combination of point of use residential and business filters and the finest exit filters. If not Gig Harbor threatens Puget Sound with the additions that would bio-accumulate to slimes of bacteria created by wastewater nutrients which aid the growth of the deadly bottom feeding simple organisms.

Third, use some of the borrowed funds and grants to take an accurate reading of all the current pollutants, an inventory of what is exiting. Based on my belief on what you will find the next step is:to create living machines (Eco-machines or reed gardens= bioremediation) natural water treatment on new developing lands that are decentralized. Especially the hospital.

Fourth, exam carefully the in-place current waste water treatment and conversion into a natural wastewater (living machine or bio-remediation system for the existing service area) See Woods Hole <http://www.toddecological.com/ecomachines.html>

Locate the living system away from wells, aquifers and wetlands.

From: Fred Felleman

Date: 04/21/2008

Comment: I found the paper failed to account for the amount of pollution that is legally discharged in to the Sound through the NPDES program. The fact that it is accounted for does not mean it is well addressed. However since it is reported it needs to be described in this paper.

The paper also lacked any sort of description of vessel based pollution. I provided a CD ROM of selected references at the first round of work shops in Seattle but found no reference to them here. There are three in particular that I would urge including in the next draft:

1) Ecology's annual report on the spills program - the funding of this entire program is in jeopardy due to the rebates the oil companies get on the barrel tax when they export refined products.

2) EPA 2007 Draft Cruise Ship Assessment Report (EPA 842-R-07-005) It is also worth noting that Senator Durban has introduced the Clean Cruise Ship Act of 2008 (S. 2881).

3) 2007 Puget Sound Maritime Air Emissions Inventory quantifies the pollutants associated with vessel and port activities.

In closing, the paper does recognize Puget Sound's limited flushing ability due to the Admiralty Inlet sill and its vulnerability to nutrient inputs June - Sept. However, no mention is made of merits of making the Sound a no discharge zone at least during the peak boater and cruise ship season. Mobile dischargers have the flexibility to hold or pump out. This idea needs further exploration as we work to reduce the inputs into the Sound from all sources.

From: Judy Pickens

Date: 04/17/2008

Comment: The paper accurately summarizes what is happening with algal blooms in Fauntleroy Cove and other embayments. We are hopeful that the state-funded project under way here and at Dumas Bay in Federal Way will cast more light on what can be done in the near term to reduce this threat to marine and human health and then what might be long-term actions that will significantly reduce nutrient loading.

PugetSoundPartnership

our sound, our community, our chance

From: Jim Hill

Date: 04/15/2008

Comment: Forty billion liters of untreated sewage is dumped into Puget Sound every year from a single source: the city of Victoria, BC. Can we stop pussyfooting at some point and deal with this?

From: Barbara Blowers

Date: 04/15/2008

Comment: I take exception to the comments about Victoria's sewage. Frankly, our own sewage treatment plants are dumping millions of gallons of pharmaceutical-laden and chemical-laden water into areas of the Sound where there is little flushing; at least Victoria's sewage empties into a fast-moving, very deep area of water. I would like to see a focus on these issues of our own sewage treatment plants and, if possible, removal of all outfalls as soon as possible. Victoria is not our problem. Our own plants are.