UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, Washington 98101-3140

OFFICE OF THE
REGIONAL ADMINISTRATOR

DEC 14 2011

The Honorable Jeffrey Merkley
United States Senate
313 Hart Senate Office Building
Washington, D.C. 20510

Dear Senator Merkley:

The U.S. Environmental Protection Agency's Administrator, Lisa Jackson, has asked me to respond to your November 14, 2011, letter regarding the Portland Harbor Superfund Site. I appreciate your continued interest in this large and complex cleanup site. Your letter requested follow-up on some issues that were not fully addressed during an August 2011 briefing and tour of the Portland Harbor Superfund Site with myself and Dan Opalski, the EPA Region 10 Director of the Office of Environmental Cleanup, other agency representatives and key stakeholders. Responses to these issues are provided in detail on an enclosure to this letter.

The Comprehensive Environmental Response, Compensation and Liability Act cleanup of the Portland Harbor is part of a larger effort to reduce toxics in the Columbia River Basin and its major tributaries. The EPA's goal for the Portland Harbor Site is to develop and implement a plan to address risks to human health and the environment in the lower Willamette that are a result of contamination from the legacy of more than a century of assorted industrial activities. In addition to addressing human health and ecological risk we are also considering treaty fishing rights for Native Americans, recontamination from ongoing sources and the many diverse uses of the lower Willamette River (such as commercial shipping, recreational beaches, and subsistence fishing). Engaging communities in the decision-making is also critical in the development of the cleanup plan.

Americans have let the EPA know that they want both a healthy environment and a healthy economy. We are striving to develop a cleanup plan for Portland Harbor that achieves both of these objectives. We believe that achieving clean sediment and water, acceptable levels of contamination in fish and wildlife and acceptable levels of risk to humans from consumption of fish need not stifle economic activity and growth.

Balancing all needs is challenging under CERCLA, which mandates that selected remedies must be protective of human health and the environment, cost effective, and utilize permanent solutions or treatment technologies to the maximum extent practicable. The National Contingency Plan further requires that selection of remedial actions be based on nine criteria, comprised of protectiveness and compliance with applicable or relevant and appropriate requirements (threshold criteria); long- and short-term effectiveness; reduction of toxicity, mobility, or volume; implementability; and cost (balancing criteria); and state and community acceptance (modifying criteria).

Cost effectiveness is determined when the detailed analysis of alternatives is completed. If all alternatives examined in the Feasibility Study are equally effective, implementable, provide the same level of protection and can all achieve Applicable or Relevant and Appropriate Requirements,

determining the most cost-effective alternative can be clear. We anticipate the draft Feasibility Study for Portland Harbor to include alternatives presented with varying degrees of long- and short-term protectiveness, implementability, and costs that will need to be balanced and weighed carefully. We are eager to complete the studies and turn everyone's energy and efforts to cleanup. The draft Feasibility Study is scheduled to be submitted by the Lower Willamette Group by the end of March 2012. This will be an important milestone in the cleanup process and is expected to provide an objective evaluation of alternatives using the CERCLA criteria.

Again, thank you for your interest in the Portland Harbor Superfund Site. I hope that you continue to follow the progress and look forward to your support for a cleanup that protects people and the environment while supporting the economic vitality of the Lower Willamette River.

If you have any further questions regarding the Portland Harbor Superfund Site, please feel free to contact me or have your staff directly contact the EPA's Remedial Project Managers Chip Humphrey, who can be reached at (503) 326-2678, or Kristine Koch, who can be reached at (206) 553-6705. All legal inquiries should be directed to Lori Houck Cora of our Office of Regional Counsel, at (206) 553-1115.

Sincerely,

Dennis J. McLerran
Regional Administrator

Enclosure

cc: The Honorable Ron Wyden
United States Senator

The Honorable Earl Blumenauer
House of Representatives

The Honorable Kurt Schrader
House of Representatives

EPA Response to

Congressional Follow-up Issues

November 23, 2011

1. *What risk scenario is this preliminary cleanup goal based on? If multiple preliminary cleanup goals are being used, please describe each risk scenario separately, including what type of fish, who is eating them, how often are they eating them, over how many years, and how they are eating them. What studies or information about fish consumption patterns does EPA rely upon for these assumptions?*

   Preliminary remediation goals (PRGs) are established once remedial action has been initially determined to be necessary. PRGs have been developed for the Portland Harbor Site for the contaminants and exposure scenarios where significant risk (defined as an excess lifetime cancer risk greater than 1×10^{-4} or non-cancer hazard index greater than 1 for human health) was quantified at the site by the risk assessments for both human and ecological receptors. A cumulative risk level of 1×10^{-6} is used as a point of departure for PRGs because the National Contingency Plan (NCP) states that preliminary remediation goals should start at the more protective end of the risk range [40 CFR Section 300.430(e)(2)(i)(A)(2)]. These PRGs are used to develop remedial alternatives.

   While the Human Health Risk Assessment (HHRA) for Portland Harbor is not finalized, the underlying analysis and calculations accepted so far by EPA demonstrate unacceptable risks associated with consumption of fish caught in Portland Harbor. The HRRA was done using actual contaminant concentration data from fish taken from Portland Harbor. Contamination impacting fish in Portland Harbor is primarily found in river sediments and to a lesser degree in the water column. Bioaccumulation though the food chain and exposure via consumption of fish caught in the river is the most likely route of human exposure. In order to assess different cleanup options for the river sediments, it is necessary to derive PRGs for sediment that are protective of benthic and aquatic organisms as well as accounting for the potential to bioaccumulate in the food chain and exposures to humans and ecological receptors that depend on the Lower Willamette River as a source of food. Water quality standards already in existence provide the quantified, protective levels in water. To develop the PRGs in sediment, the Lower Willamette Group (LWG) is using a number of methods. The results of direct toxicity testing will be used to derive ecological PRGs for benthic organisms. To assess exposures that occur via bioaccumulation through the food chain, the LWG is using a food-web model that relates the concentration of selected organic contaminants (e.g., PCBs and DDT compounds) in fish and other wildlife organisms to concentration in sediment.

The baseline HHRA evaluated a number of different exposure scenarios. These were selected to assess potential exposures that can occur at Portland Harbor through direct contact with contaminants in sediment and surface water, indirectly through the consumption of both resident and non-resident fish caught within Portland Harbor, and a combination of both direct and indirect pathways when both types of exposure are likely to occur. Direct exposures to contaminants in beach and in-water sediments and surface water were evaluated for those who may work in business located along the river (including dockworkers and those individuals whose job responsibilities may include diving or dredging), people who use the river for recreational activities and transients who are known to camp on the shores of the Lower Willamette. Given the nature of the most prevalent contaminants in Portland Harbor, direct exposures are considered those that occur when small amounts of soil or sediment are incidentally swallowed, or there is direct contact with sediment so that contaminant absorption through the skin is likely to occur. Indirect exposures are most likely to occur through bioaccumulation in the food chain, specifically fish and other aquatic organisms that reside in the harbor, and exposures from recreational, subsistence, and ceremonial fishing uses of the river. Specifically, the exposure scenarios evaluated in the risk assessment are as follows:

- Dockside worker–exposure to beach sediment at specific locations designated as industrial areas.
- In-water worker–exposure to in-water sediments encountered in the course of maintenance dredging or repairing structures located in the river, such as docks.
- Transients–exposure to beach sediment and surface water. In addition, exposure to a groundwater seep that discharges contaminated groundwater from an upland source was also evaluated .
- Recreational beach users–exposure to beach sediments and surface water while swimming at specific locations where access for recreational use is considered likely.
- Tribal, subsistence, and recreational fishers–exposure to beach or in-water sediments while fishing, exposure to contaminants bioaccumulating in the food chain through consumption of locally-caught fish.
- Divers–exposure to in-water sediments and surface water.
- Domestic water users–exposure to surface water if used as a source of drinking water.

Several fish and shellfish consumption scenarios were evaluated in the baseline HHRA to determine whether adverse health effects could occur via these indirect exposures to contamination at the site. To assure that risks from contamination released to the environment at Portland Harbor are what are quantified, this evaluation focused largely

on "resident" fish, those that spend their entire lives in the site. Contaminant concentrations were measured in four target resident fish species; smallmouth bass, black crappie, brown bullhead, and common carp. In addition, at the request of tribal stakeholders, samples of salmon, lamprey, and sturgeon were also collected and analyzed because those species are significant for tribal dietary and ceremonial uses. Contaminant concentrations in resident fish species and salmon were analyzed as whole body and fillet samples, lamprey were analyzed as whole body only, and sturgeon were analyzed as fillet only. Exposures to recreational anglers and subsistence fishers were evaluated in 17 separate fish consumption scenarios, each assuming three different consumption rates. These evaluations consisted of assuming that the entire portion of a person's diet that is fish consists of locally-caught fish of a single species, and using the contaminant concentrations measured in either the whole body or fillet only. Also assumed is that fish are caught over 4-mile long stretches of the river, or in the case of smallmouth bass (which have been shown to have a small home range in Portland Harbor), based on each river mile along the site. Each single-species diet was also evaluated by averaging concentrations over a harbor-wide basis. Finally, a harbor-wide analysis was done assuming that the portion of fish in the diet is comprised of equal portions of each of the four resident fish species.

Superfund risk assessment guidance recommends the evaluation of the Reasonable Maximum Exposure (RME), which is defined as the highest exposure reasonably expected to occur in the absence of any institutional controls such as consumption advisories. EPA recommended that site-specific fish consumption studies not be conducted for the Portland Harbor risk assessment because such studies can often be very time-consuming and expensive. EPA's experience with other sediment sites indicated that readily available published studies and guidance would sufficiently describe the range of reasonably expected fish consumption rates relevant to the different populations known to occur in the Portland Harbor area. Therefore, three fish consumptions rates were evaluated in the human health risk assessment: 17.5 grams per day (2 eight ounce meals per month), 73 g/ day (10 eight ounce meals per month) and 142 g/day per day (19 eight ounce meals per month). The consumption rates of 17.5 g/day and 142 g/day represent the 90th and 99th percentile consumption estimates of freshwater/estuarine finfish and shellfish for individuals 18 or older from a national study (EPA 2002). The value of 73 g/day represents the 95 percent upper confidence limit on the mean consumption rate from a creel study conducted in the Columbia Slough (Adolfson 1996). Additionally, consumption of shellfish was evaluated using two consumption rates: 18 g/day (2 eight ounce meals per month) and 3.3 g/ day (less than 1 eight ounce meal every two months), representing the 50th and 95th percentile ingestion rates for shellfish consumption from freshwater and estuarine systems for individuals of age 18 and older in the United States (EPA 2002).

Sources:

US EPA Estimated Per Capita Fish Consumption in the United States, EPA 821-C-02-003; 2002.

Adolphson Associates, Inc, Technical Memorandum on the Results of the 1995 Fish Consumption and Recreational Use Surveys, Amendment Number 1, April 19, 1996.

The dietary consumption rates of tribal members were assessed in the risk assessment using data from the Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin (CRITFC). A consumption rate of 175 grams per day, which represents approximately the 95th percentile fish consumption rate from the CRITFC Survey (CRITFC 1994), was used to estimate ceremonial and subsistence intakes for adult tribal fish consumers. At the request of the involved tribes, tribal fish consumption was evaluated considering a multi-species diet, not a single species as for non-tribal recreational and subsistence fishers, and only on a harbor-wide basis.

Source: A Fish Consumption Survey of the Umatilla, Nez Perce, Yakama, and Warm Springs Tribes of the Columbia River Basin. Columbia River Inter-Tribal Fish Commission (CRITFC). Technical Report 94-3. October, 1994.

It is important to note that on June 16, 2011, the Oregon Environmental Quality Commission approved a fish consumption rate of 175 grams per day, referenced from the CRITFC (1994) survey, as the basis for ODEQ to revise state human health protective water quality standards. EPA approved Oregon's new standards on October 17, 2011.

The use of daily consumption rates in the risk assessment should not be construed to mean that it is assumed that fish are consumed on a daily basis. Rather, the daily consumption rates represent a simplified mathematical technique used to calculate annualized intakes by presenting the values as average daily values although seasonal variability and other specific consumption habits may mean that actually daily consumption rates vary a great deal from the actual values used in the calculations. Because cancer risks are also dependent on the overall duration of the exposure, the risk assessment must also consider the duration over which the annualized intakes occur. RME evaluations in Superfund risk assessments typically assume a duration of 30 years, which has typically represented approximately the 95th percentile of the length of continuous residence in a single location in the U.S. population. More recent studies described in EPA's 2011 Exposure Factors Handbook show the 95th percentile value is closer to 33 years, data from the U.S. Census Bureau indicate that 32 years represents the

best estimate of residence time at the 90th percentile. However, for the sake of consistency, the 30 year value was used in the Portland Harbor risk assessment, and is consistent with other Superfund risk assessments nationwide. Although data on Native American populations is less readily available, input during the scoping of the Portland Harbor risk assessment indicated that this population should be considered less mobile for a variety of reasons. Hence, the evaluation of exposures to Native Americans was based on the premise that they spend their entire lives in the area, and a typical lifetime was evaluated as being 70 years.

2. *What is the decision-making process and criteria for determining the scenarios of fish and shellfish consumption by EPA nationwide? Are there special circumstances which would require a stricter standard for the Portland Harbor Superfund Site?*

   Consumption rates of locally-caught fish vary greatly across different regions of the United States. For this reason, EPA guidance generally recommends that fish consumption be evaluated to account for these known regional differences. In practice, EPA may use the consumption rates obtained from the national studies described above as a starting point, but where site-specific information indicates local consumption rates are higher, nationally-derived values may not be protective of the actual exposed population. This is a particular concern where Native American populations use the resource. At Portland Harbor, six tribal governments are involved, including four Columbia River Treaty tribes, and two Oregon tribes with usual and accustomed fishing rights in the Willamette River basin. Other site specific information is also considered, like the Public Health Assessment report, which is a written report produced by the Agency for Toxic Substances and Disease Registry (ATSDR) that reviews available information about hazardous substances at a site and evaluates whether exposure to them might cause any harm to people. The Public Health Assessment report for Portland Harbor (ATSDR 2002, 2006) indicated that eight resident species in the lower Willamette River are abundant and easily caught, and subsistence use by the local population appears to occur, especially of carp by Asian and Eastern European communities.

   Source: Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Assessment for Portland Harbor. U.S. Dept. of Health and Human Services. March 22, 2006.

3. *The "tribal scenario" was mentioned as one scenario for fish consumption. It is our understanding from the 2004 Oregon Department of Health fish advisory that the concern is about eating resident fish (like carp and bass) and that salmon are safe to eat. Does the "tribal scenario" EPA used assume that a tribal fisher is consuming bass and carp, or more traditional native species such as salmon and lamprey?*

It is correct that the 2004 fish advisory recommended limiting consumption of resident fish (like carp and bass) and that no consumption limits were placed on migratory fish like salmon or steelhead. The Tribal Fish Consumption scenario in the human health risk assessment evaluated a multi-species diet on a harbor-wide basis using the fish consumption data from the CRITFC Survey. According to information provided in that survey, salmon, lamprey, and sturgeon comprise approximately half of the tribal diet of fish, with a variety of anadromous and resident species comprising the remaining portion. The risks associated with a tribal fish consumption scenario were assessed by assuming equal portions of salmon, lamprey and sturgeon representing approximately half of the 175 g/day tribal consumption rate, with the remaining half of the diet apportioned equally between the four resident fish species (bullhead, crappie, bass, and carp) for which tissue data were available.

4. *How are the risk scenarios underlying EPA's preliminary cleanup goals similar to, or different from, the assumptions used by the Oregon Department of Health for the 2004 fish advisory?*

   The 2004 fish consumption advisory was based on fish tissue data that were collected as part of the Portland Harbor Remedial Investigation and information in the initial 2002 Public Health Assessment report that was updated in 2006 (ATSDR 2006). The fish advisory for Portland Harbor recommends limiting consumption of resident fish to no more than one 8 ounce meal per month, which is equivalent to a daily consumption rate of 6.5 g/day. Of the current PRGs for Portland Harbor based on consumption of resident fish by humans, the highest values are based on a 17.5 g/day consumption rate used in the risk assessment, which represented the lowest of the four consumption rates evaluated. It is important to note that the fish advisories represent recommendations based on 2004 information and seek to protect the current known state of the harbor, and thus inform the public of actions they should take to protect themselves. EPA's cleanup plan and the final cleanup goals are intended to protect for all reasonably expected current and future uses of the lower Willamette River.

   Source: Agency for Toxic Substances and Disease Registry (ATSDR), Public Health Assessment for Portland Harbor. U.S. Dept. of Health and Human Services. March 22, 2006.

5. *We have also heard that EPA's scenario involves an assumption that someone consumes bass and carp from the river and always eats it without any preparation (no cleaning or cooking) and that they eat the whole fish (including the skin and internal organs). Is this correct?*

   It is correct that some of the scenarios are based on whole body consumption. There are valid reasons for doing this. Many of the contaminants that we are finding to pose

significant risk at this site (e.g., PCBs) are lipophilic, which means that they accumulate in the fatty tissue more than the muscle tissue (or skin, bones or other organs). Since many people cook the whole fish or fillet with skin and consume the fatty tissues, and some consume various internal organs, it is important to evaluate these consumption patterns in the RME scenario at this site. For example, interviews conducted as part of the Public Health Assessment found that whole body carp is used for soup and making fish paste (which is often fed to infants and children). However, analysis of individual organs and other parts of the fish sampled was not done for a number of reasons, including the increased costs of those analyses. As a result, any evaluation of consumption habits of those who consume more than just the fillet could only be done using the whole body data.

Additionally, it is important to remember that the risk assessment also evaluated the risks associated with consumption of fillet only for all resident fish species in addition to the evaluation of whole body fish. While the Public Health Assessment noted that preparation and cooking methods associated with fillet-only consumption tend to further reduce fat-soluble contaminants, such as pesticides and PCBs, and that removing the skin, head, eyes, organs and fat will reduce the amount of contaminants as well, such issues were not considered in the human health risk assessment because the overall reduction can't be accurately quantified and EPA can't control the preparation and cooking methods by the general population.

It is important to note that the conclusion of the baseline Human Health Risk Assessment for Portland Harbor shows that there is significant risk to humans consuming fish regardless of whether they consume the whole body or fillet, single species or multiple species, or consume a high number of fish from the river or just occasionally consume fish from the Lower Willamette River. The Oregon Department of Health fish advisory supports this in recommending that fish consumption be limited due to unacceptable contaminant concentrations in fish.

6. *There appears to be more emphasis on building riparian habitat rather than clean up or prevention of chemical contamination. Has any work has been done to establish the point of diminishing returns economically and environmentally for various clean up strategies?*

EPA's statutory mandate under the Superfund law is to address significant risks to human health and the environment by cleaning up contamination. The Natural Resource Trustees designated under the law will look at restoring loss of habitat as potential compensation for the damages to natural resources resulting from the release of contamination from the site.

EPA has requested that the analysis of alternatives in the draft Feasibility Study include the estimated costs of mitigation if any alternative is likely to result in the unavoidable loss of aquatic habit, which would be required under the Clean Water Act. Likewise, implementation of the remedy will also need to consider potential impacts to endangered species and their critical habitat under the Endangered Species Act (ESA). Federal and state natural resource agencies have developed guidance on habitat values for Portland Harbor which EPA will consider in evaluating mitigation requirements and potential ESA impacts from the remedy.

The draft Feasibility Study, which is due in March 2012, will provide key information on the environmental benefits of cleanup and the associated costs. This will include evaluations showing predicted reductions in sediment contaminant levels associated with increasing the number of acres of sediment that would need to be cleaned up. This type of information will allow reviewers to look at where cleanup could be focused to maximize environmental benefits, and where there would be diminished returns.

7. *We have also heard that other superfund sites have selected remedies, yet still have higher levels of PCB's and contaminants than the Portland Harbor has now. Is this correct?*

There are other superfund sites that have selected sediment cleanup levels that are higher than the site-wide average of current PCB levels at the Portland Harbor Superfund Site. However, PCBs are not the only contaminant of concern at this site. Cleanup level decisions are based on site-specific conditions and ARARs that cannot be easily extrapolated to another site. Unfortunately, there are too many differences between sites to have a presumptive sediment cleanup level for individual contaminants. CERCLA requires EPA to look at each site's unique circumstances and conditions to determine the appropriate clean up to protect human health and the environment at each specific site. Some sites have technical impracticabilities that make it impossible to meet risk-based goals and need to require continued restrictions on the use of resources while other sites can meet risk-based goals and restore the site to allow a healthy and varied use of the site. As such, different sites (including sediment sites) may have different cleanup levels. Therefore, it is more beneficial to look at the remedy selection process and the site-specific rational applied within this process when considering national consistency. Additionally, EPA has a national remedy review board that reviews all sites with remedies expected to exceed $25 million, and a Contaminated Sediment Technical Advisory Group (CSTAG) to review significant sediment sites nationally, like Portland Harbor to ensure national consistency at those significant sites. Both groups will be reviewing the remedy selected for Portland Harbor by EPA Region 10 prior to EPA presenting the selected remedy to the public for their input.