United States Environmental Protection Agency
Region 10

Comment on the Proposed Harbor Oil Cleanup Plan by December 14, 2012

Harbor Oil Superfund Site

Portland, Oregon November 2012

The Environmental Protection Agency invites you to comment on our proposed plan for the Harbor Oil Superfund site in Portland, Oregon. The Harbor Oil proposed plan is part of our public participation responsibilities under the Comprehensive Environmental Response, Compensation, and Liability Act - CERCLA or Superfund. The proposed plan summarizes the extensive information in our remedial investigation and administrative record. We encourage you to review this proposed plan and supporting documents. Please send us your comments by December 14, 2012.

Proposed Plan

The remedial investigation and risk assessments for the Harbor Oil Site show that cleanup is not needed because the contamination we found does not pose an unacceptable risk to people's health or the environment.

From our investigation, we know that past chemical releases at the site did not leave significant levels or areas of contamination. We know that the chemical levels in the groundwater are within federal standards. We also know that there are no significant environmental impacts to Force Lake or the surrounding wetlands. Finally, our risk assessment shows us that the health risks for industrial workers and recreational users of Force Lake are within our acceptable risk range.

Only if this site were built with homes could it pose an unacceptable health risk for people. However, this is an industrial site within an Industrial Sanctuary designated by the city of Portland. This site is also surrounded by protected wetlands and open space. We expect that this site will continue to be used for industrial and open space and that future residential use is unlikely.

Based on our remedial investigation, our review of all available data, and the current and future site use, we propose that no cleanup is required under CERCLA for the Harbor Oil site.

EPA invites community members to attend a public meeting on **December 6,** to learn about the proposed plan and to submit comments for the record. EPA staff will be available to answer questions during the open house from 6 p.m. to 7 p.m. At 7, we will give a presentation on the proposed plan and hear public comments for the record.

Comments are due by December 14	Public Meeting
We welcome your comments on the Harbor Oil proposed plan. Comment at the public meeting or send your comments by **December 14** to: **Christopher Cora** U.S. EPA Region 10 1200 Sixth Ave, Ste. 900, ECL-115 Seattle, WA 98101-3140 Tel: 206-553-1478 Email: **cora.christopher@epa.gov**	EPA is holding a public meeting to explain the Harbor Oil proposed plan and hear your comments. EPA staff will be available to answer questions at the open house. **December 6, 2012** 6 p.m. – Open House 7 p.m. – Presentation & Public Comments **Historic Kenton Firehouse** 8105 N Brandon St. Portland, Oregon

Harbor Oil History

The Harbor Oil site is located at 11535 North Force Ave, on about 4 acres next to Force Lake, in an industrial area of northeast Portland. The surrounding area was once a World War II neighborhood called Vanport. Vanport was destroyed in a 1948 flood. The Harbor Oil facility began cleaning tanker trucks in the 1950s and began oil recycling in 1961. A fire destroyed the facility in 1979, which released chemicals into the wetlands and Force Lake. After the fire, the facility was reconstructed and expanded. The facility also constructed a dirt wall to prevent the flow of stormwater or other pollution into the wetlands.

Since the early 1970s, the facility has had multiple state and federal inspections and permits for its discharges and operations. Those inspections found problems or violations that required the facility to install pollution controls like oil/water separators and pay fines. In 1975, the facility received an industrial stormwater permit for discharges to the facility's north ditch. In the 1980s, the stormwater discharge moved to the west corner of the facility. The facility is now operating under state permits and approvals including an air permit, spill prevention plan, and a stormwater permit. The current operator is American Petroleum Environmental Services Inc., who recycles used oil at the site. The facility's stormwater and industrial wastewater once drained to low lying areas in the south and southwest. These low-lying areas were later filled in. In the 1970s, the facility constructed a drainage ditch along the northeast boundary to discharge stormwater to the wetlands.

The facility was unpaved and covered with gravel until it was paved in 2011. The current stormwater treatment system collects, treats, and discharges all facility stormwater to the wetlands south of the facility. The facility monitors its stormwater discharges as required by the stormwater permit.

EPA put the Harbor Oil site on the Superfund National Priorities List in 2003. In 2007, EPA negotiated with some of the potentially responsible parties to conduct a remedial investigation/ feasibility study.

The potentially responsible parties, known as the Harbor Oil Voluntary Group, are Avista Corp., Bonneville Power Administration, Chevron USA Inc., North Western Corp., Portland General Electric Co., Texaco Downstream Properties Inc., Texaco Downstream LLC, The Montana Power Co., Union Oil Co. of California, and Waste Management Disposal Services of Oregon Inc.

In 2007, EPA ordered the previous operator, Energy and Materials Recovery Inc. to sample a 320,000-gallon metal tank containing water, oil, and solids. The tanks contained petroleum wastes. In 2008, the facility emptied, cleaned, and later dismantled the tank.

Investigating Harbor Oil

Superfund remedial investigations study the type and amount of contamination at a site and the possible risks to people's health or the environment. Before EPA's Superfund investigation at Harbor Oil, there were eight earlier investigations by federal, state, and private entities. EPA included data from one of the earlier studies in 2001 in our Superfund remedial investigation. The other studies did not meet our data quality requirements, however, they helped us determine sampling locations for the remedial investigation.

Under EPA's oversight, the Harbor Oil Voluntary Group conducted the Superfund remedial investigation in 2008-2009. The remedial investigation covered a 19-acre area that includes the Harbor Oil facility, Force Lake, and wetlands west and south of the facility that drain to Force Lake. The Voluntary Group sampled facility soil at 61 locations, wetland and ditch soil at 52 locations, Force Lake sediments at 11 locations, surface water at three locations, and groundwater in 16 monitoring wells.

Based on past and current facility activities, the Voluntary Group tested the soils, sediments, groundwater, and surface water to identify the chemicals of concern and the extent of contamination.

Investigating Harbor Oil

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EPA also surveyed Force Lake in 2009 to identify the different fish types, and their size and abundance.

For each type of sample, like soils or surface water, we predicted how people or wildlife could contact the contaminants in the soil or surface water at this site. For instance, an industrial worker could be exposed to chemicals in the soil by digging on the site. Someone who fishes in Force Lake could be exposed to the chemicals in the lake sediments.

Wildlife such as shrews or birds could also be exposed to chemicals in the soil. With this information, we calculated the highest exposures that people or wildlife could get at this site, based on the site use now and in the future. These calculations are called the "reasonable maximum levels" of possible current and future exposure.

This comparison helped focus our study on the contaminants at the Harbor Oil site. The Voluntary Group analyzed all of the samples for these contaminants:

- total petroleum hydrocarbons or TPHs
- polycyclic aromatic hydrocarbons or PAHs
- carcinogenic PAHs or cPAHs
- semi volatile organic compounds or SVOCs
- volatile organic compounds or VOCs
- polychlorinated biphenyls or PCBs
- pesticides, including dichlorodiphenyltrichloroethanes or DDTs
- metals, including arsenic, copper and chromium

With this list of contaminants, we compared the predicted exposure levels to our screening levels for health or ecological risk. We also compared these levels to the existing or natural local "background" levels of the chemicals. It is important to note that the screening levels we use are much lower than our "cleanup action levels." Cleanup action levels would usually trigger an EPA cleanup.

Finding a chemical above the screening level indicates that further evaluation is necessary, not that cleanup is required under Superfund, depending on the use of the site and other considerations.

Table 1 and **Table 2** show where we found contaminants at the site, the chemical concentrations, and how often the contaminants were detected.

Soils at the Facility

The Voluntary Group collected 139 soil samples within the facility boundary beneath the gravel surface, which is now paved. The results are shown in **Table 1**. There were five metals of concern, because their concentrations exceed Oregon's state background concentrations and exceed screening values. Most metals were highest in the soils just below the gravel. Arsenic, chromium, and copper were found at higher concentrations in intermediate soils, five to seven feet below the ground surface, in areas that used to be sumps or ponds, and were later filled in. However, all of the metal concentrations were below levels that would usually trigger an EPA cleanup.

Concentrations of PCBs were highest in the driveway area of the facility, likely due to historical application of oil to the roads for dust suppression. Only three of the facility soil samples had concentrations above levels that would usually trigger an EPA cleanup, and they were all in the facility driveway. The highest concentrations of DDT were within the southern boundary of the facility. All of the samples were below levels that would usually trigger an EPA cleanup. In one soil sample next to the tank farm, benzene was above a level that would usually trigger an EPA cleanup. All other benzene and VOCs concentrations were below levels that would usually trigger an EPA cleanup.

Soils in the Wetlands

The Voluntary Group tested 72 soil samples from the wetlands. The results are shown in **Table 1**. For earthworms, insects, birds, and mammals, the contaminants in wetland soils are chromium, copper, zinc, total PAHs, total DDTs, and mercury.

The chemical concentrations in wetland soils are higher than our ecological screening levels and higher than background levels.

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Investigating Harbor Oil

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Overall, the soil areas that have higher chemical concentrations do not cover a large area and are scattered. Chromium concentrations are higher throughout the ditch area. We did not find concentrations of PCBs, SVOCs or chlorinated VOCs high enough to be a risk for wildlife.

Sediments in Force Lake and North Lake

The Voluntary Group collected 14 sediment samples from Force Lake. They collected three samples from North Lake, directly below the culvert, which drains Force Lake to North Lake. The chemicals TPH, total PAHs, PCBs, DDT, arsenic, chromium, copper, mercury, and zinc were all detected in Force Lake sediments. The results are shown in **Table 1**.➡

PCBs were in two-thirds of the sediment samples and DDTs were in all of the sediment samples in Force Lake. Arsenic, chromium, copper, mercury, and zinc concentrations were elevated. Concentrations in North Lake were either lower or similar for copper and arsenic, and within background ranges.

Force Lake

The Voluntary Group collected three surface water samples from Force Lake and three surface water samples from North Lake. Only arsenic and copper were detected. Arsenic was detected in all three samples, but the concentrations were below the federal water quality standard. Copper was detected in just one sample above the federal water quality standard. The results are shown in **Table 2** on Page 6

Groundwater

The Voluntary Group collected 34 groundwater samples from 16 monitoring wells within the facility boundary. Contaminant concentrations were generally low and infrequently detected.

TPH, PAHs, benzene, metals, TCE, and DDTs were detected at elevated levels. The results are shown in **Table 2**.

Arsenic was detected at concentrations greater than the federal drinking water standard. However, similar concentrations of arsenic were detected in groundwater across the facility, including shallow groundwater at the upgradient property boundary near the northeastern corner of the facility. These results are very similar to arsenic concentrations throughout the area, and they do not indicate they are due to activities at the site.

Lead was found above the federal drinking water standard in only one sample in one well in 2001. Lead was not detected in samples collected from the same well in 2008 or 2009. All other metals were detected infrequently at lower levels.

During the 2008 sampling, the Voluntary Group found a thin layer about an inch thick of floating petroleum product in one well. After more sampling and water level measurements, the floating product was less than a quarter of an inch.

We did not find floating petroleum product in any other monitoring wells, or in any of the soil borings, indicating it is very isolated and not impacting groundwater. We believe that the floating petroleum product is just a small isolated area that does not pose a risk.

DDTs were detected in four shallow and intermediate groundwater wells. The maximum DDT concentration was below the human health screening level for DDT. Chlorobenzene was detected above the federal drinking water standard in only one sample from one well.

In 2000, trichloroethylene or TCE was detected barely above the federal drinking water standard in a deep well located in the northeastern corner of the facility. However, since no TCE was detected in shallow or intermediate monitoring wells, or in the same well in 2008, we concluded that the TCE is not site related. In 2008, benzene was detected in one well above the federal drinking water standard. However, in 2009 the benzene concentration was again below the standard in the same well. Benzene was not detected in any other well above drinking water standards.

Table 1. Summary of significant chemical concentrations in soils and sediments

Chemical	Unit	Concentration or Toxic Equivalent Range (Mean Concentration or Toxic Equivalent)			Area(s) with Highest Detected Concentrations
		Facility Soil	Wetland Soil	Force Lake Sediment	
TPH – gasoline range	ppm	5.6 U – 3,800 (260) DF = 62%	9.4 U – 58 U (nc) DF = 4%	7.7 U – 80 U (nc) DF = 9%	central part of facility near former tanker truck cleaning
TPH – diesel range	ppm	8.0 – 13,000 (1,700) DF = 100%	7.4 U – 4,000 (400) DF = 90%	16 – 270 (98) DF = 100%	central part of facility near former tanker truck cleaning and along nearby southwest facility boundary
TPH – motor oil range	ppm	38 – 12,000 (2,200) DF = 100%	15 U – 6,600 (1,200) DF = 94%	130 – 2,000 (760) DF = 100%	
Total TPH	ppm	46 – 25,000 (4,100) DF = 100%	15 U – 9,300 (1,500) DF = 94%	150 – 2,300 (840) DF = 100%	
cPAH Toxic Equivalent	ppb	14.0 – 4,900 (565) DF = 93%	38.0 – 5,200 (438) DF = 96%	11.6 – 118 (61.9) DF = 100%	central part of facility near tanker truck cleaning and tank farm, and in one sample collected from soil berm in the west corner of facility
Total PAHs	ppb	36 J – 360,000 (13,000) DF = 98%	200 J – 28,190 J (3,000) DF = 98%	104 – 1,060 (560) DF = 100%	
Benzene	ppb	1.0 U – 6,400 (140) DF = 38%	1.6 U – 56 (6) DF = 51%	1.1 U – 8.2 U (nc) DF = 0%	central part of facility near tank farm
Total PCBs	ppb	4.9 J – 32,000 (2,000) DF = 80%	32 U – 4,200 (400) DF = 62%	32 U – 131 (80) DF = 64%	east corner of facility near entrance, central part of facility near tanker truck cleaning, along U-shaped roadway extends from facility entrance around truck cleaning area
Arsenic	ppm	0.7 – 20.6 J (3) DF = 100%	1.5 – 53.1 (9) DF = 100%	2.6 – 7 (6) DF = 100%	west corner of facility, area of former unlined holding pond/C-shaped area, and former drainage ditch to west of facility
Chromium	ppm	4.0 – 63 (20) DF = 100%	6.6 – 149 (30) DF = 100%	7.7 – 34 (30) DF = 100%	west corner of facility and former drainage ditch to west of facility
Copper	ppm	9.23 – 1,070 (100) DF = 100%	10.3 – 162 (60) DF = 100%	16.2 – 72 (53) DF = 100%	west corner of facility and area of former unlined holding pond/C-shaped area
Mercury	ppm	0.03 – 6.69 (0.2) DF = 45%	0.06 – 0.4 (0.2) DF = 90%	0.06 U – 0.3 U (nc) DF = 9%	area of former unlined holding pond/C-shaped area
Zinc	ppm	35 – 718 J (200) DF = 100%	37 – 748 (230) DF = 100%	80 – 229 (200) DF = 100%	west corner of facility, area of former unlined holding pond/C-shaped area, former drainage ditch west of facility, and area near current and former stormwater treatment system discharge points near southwest corner of facility
Total DDTs	ppb	0.6 U – 78,000 J (8,000) DF = 95%	2.7 J – 46,000 (3,000) DF = 98%	22 J – 250 (160) DF = 100%	central part of facility near former truck cleaning, in the C-shaped area west of the former truck cleaning, along southwest facility boundary
TCE	ppb	1.0 U – 2,400 (66) DF = 11%	1.5 U – 15 U (nc) DF = 5%	1.1 U – 8.2 U (nc) DF = 0%	central part of facility near former truck cleaning

DF: detection frequency, J: estimated concentration, U: not detected (concentration shown is reporting limit), nc: not calculated, ppm: parts per million (mg/Kg), ppb: parts per billion (ug/Kg)

Table 2. Summary of significant chemical concentrations in groundwater and surface water

Chemical	Water Concentration or Toxic Equivalent Range Mean Concentration or Toxic Equivalent)				Area(s) with Highest Detected Concentrations
	Unit	Groundwater (Shallow)	Groundwater (Intermediate and Deep)	Force Lake Surface Water	
TPH – gasoline range	ppm	0.25 U – 0.81 (0.22) DF = 23%	0.25 U (nc) DF = 0%	not analyzed	near tank farm and former C-shaped area
TPH – diesel range	ppm	0.25 U – 0.26 J (nc) DF = 0%	0.25 U (nc) DF = 0%	0.25 U (nc) DF = 0%	detected in only one groundwater sample from well A-18 near former C-shaped area
TPH – motor oil range	ppm	0.5 U (nc) DF = 0%	0.50 U (nc) DF = 0%	0.50 U (nc) DF = 0%	not detected
Total TPH	ppm	0.27 – 1.07 J (0.33) DF = 23%	0.50 U (nc) DF = 0%	0.50 U (nc) DF = 0%	near tank farm and former C-shaped area
cPAH Toxic Equivalent	ppb	0.0910 U – 1.50 U (nc) DF = 0%	0.0910 U – 1.40 U (nc) DF = 0%	0.0910 U (nc) DF = 0%	not detected
Total PAHs	ppb	0.10 – 6.3 (1) DF = 43%	0.10 U – 3.8 U (nc) DF = 0%	0.10 U (nc) DF = 0%	near facility exit and in area of base oil refining plant
Benzene	ppb	0.20 U – 140 (6) DF = 29%	1.0 U (nc) DF = 0%	1.0 U (nc) DF = 0%	near tank farm
Total PCBs	ppb	0.10 U – 0.96 U (nc) DF = 0%	0.10 U – 0.92 U (nc) DF = 0%	0.10 U (nc) DF = 0%	not detected
Arsenic	ppb	0.8 – 32.2 (10) DF = 100%	0.2 U – 6.3 (3.4) DF = 80%	0.9 – 1.0 (1) DF = 100%	near tank farm
Chromium	ppb	5 U (nc) DF = 0%	5 U (nc) DF = 0%	5 U (nc) DF = 0%	not detected
Copper	ppb	2 U – 5 (nc) DF = 0%	2 U (nc) DF = 0%	2 U – 4 (nc) DF = 33%	low variability in concentrations
Mercury	ppb	0.1 U (nc) DF = 9%	0.1 U (nc) DF = 0%	0.1 U (nc) DF = 0%	low detection frequency in groundwater
Zinc	ppb	10 U – 80 (nc) DF = 9%	10 U – 9,870 (nc) DF = 20%	10 U (nc) DF = 0%	plant well (PW-01), located in east corner of facility
Total DDTs	ppb	0.0071 J – 0.24 J (0.030) DF = 43%	0.01 U – 0.048 (0.015) DF = 50%	0.010 U (nc) DF = 0%	detected in shallow groundwater samples in some areas where DDT concentrations in soil samples were highest (exit driveway, along south-west boundary of facility)
TCE	ppb	0.20 U – 1.0 U (nc) DF = 0%	1.0 U – 6.1 (nc) DF = 17%	1.0 U (nc) DF = 0%	detected only in plant well (PW-01) in east corner of facility

DF: detection frequency, J: estimated concentration, U: not detected (concentration shown is reporting limit), nc: not calculated, ppm: parts per million (mg/Kg), ppb: parts per billion (ug/Kg)

Assessing the Site Risks

In EPA environmental investigations, "risk" is the possible harm to people or wildlife from exposure to chemicals. We assess two types of health risks for people: the risks that can cause cancer and the risks that can cause other health effects. We evaluate only non-cancer risks to wildlife.

The risk assessment is designed with a wide margin of safety to be sure that we protect people's health and the environment. There is some uncertainty involved, but we use conservative assumptions and calculations to make sure that we do not underestimate the risks. Real life exposures and health risks are probably less than our risk calculations because of these conservative assumptions.

Calculating risk under Superfund

We use our risk assessment to determine if the contamination at a site poses an unacceptable risk to human health or the environment. The CERCLA regulations give us a range of risk numbers to use in deciding if federal cleanup is necessary. EPA established an "acceptable" extra cancer risk range, from one in ten thousand (1 in 10,000) to one in one million (1 in 1,000,000) over a person's lifetime.

An extra cancer risk means that one more person could get cancer from the chemicals at a Superfund site than we would normally expect from all other causes of cancer over that person's entire lifetime. For example, a 1 in 10,000 risk means that if a person was exposed to the chemicals at the site for 25 years, we would expect that one extra person could develop cancer over their lifetime, out of 10,000 people.

For non-cancer health effects, we calculate a hazard quotient or hazard index. The hazard index combines the hazard quotient for several chemicals that have the same or similar effects. The hazard quotient estimates a person's exposure to a single chemical at a site compared to a daily exposure level that would have no health effect. The non-cancer hazard index has a threshold below which we do not expect any non-cancer health effects. If the hazard quotient or hazard index is 1 or higher, it is possible that exposure to site contaminants could be a risk to people's health.

Risk and Superfund cleanup

Under CERCLA, cleanup is not required if the cumulative cancer risk, based on reasonable maximum exposure for current and future land use, is less than 1 in 10,000, and the non-cancer hazard index is less than 1. But if a site could hurt the environment, EPA can clean up the site under CERCLA. For wildlife,we use a "Low Observed Adverse Effect Level" hazard quotient to determine if cleanup is needed.

Human Health Risk

For the Harbor Oil site we assessed the possible risks to people's health in a "Human Health Risk Assessment." We estimated the health risks to people from chemicals in the site soil, lake sediment, lake water, groundwater, and fish caught in Force Lake.

We evaluated the different ways that people might be exposed to the chemicals, what concentrations they could be exposed to, and how often and how long they might be exposed. At Harbor Oil, we evaluated the risks for current and future workers and for people who use the wetlands and lakes for recreation.

Table 3 shows the results of the human health risk assessment. The risk assessment calculated the total extra cancer risk and overall hazard index for each of the possible ways people might be exposed to the contaminants. At Harbor Oil, we determined that all of the cancer risk estimates are within the acceptable risk range of 1 in 10,000 to 1 in 1,000,000.

Low risk for working and recreation

The overall hazard index for each chemical was less than or equal to 1 for all people, except if people could eat many fish from Force Lake. If a person could eat many fish from Force Lake, the hazard index would be 3.

But when we evaluated the specific health effects, and how the chemicals can cause those effects, the effects are not additive. In this case, the specific hazard quotient would be less than or equal to 1.

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Human Health Risk

Table 3. Human health risk summary of potential exposures

	Total extra cancer risk	Hazard Index
Industrial worker doing construction or trenching	3 out of 1,000,000 (3×10^{-6})	1
Future outdoor worker	2 out of 100,000 (2×10^{-5})	0.6
Industrial/commercial worker vapor intrusion	9 out of 10,000,000 ($9 \times 10^{-7)}$	--
Force Lake recreational user	1 out of 100,000 (1×10^{-5})	0.4
Force Lake fish consumer	2 out of 100,000 (2×10^{-5})	3*

*When we evaluate the specific health effects, and how the contaminants cause those effects, the effects are considered individually, the effects are not additive. Considering the specific types of health effects and their causes, the specific hazard is actually less than or equal to 1.

EPA's 2009 fish survey and a 1989 fish survey show that there is a small population of fish in Force Lake. We found only two fish larger than one foot in Force Lake.

Our risk assessment calculated the number of meals that an adult person might eat from Force Lake to determine the health risk to that person. The highest fish consumption rate used in the risk assessment assumed that a person would eat 28 meals (8 oz. serving) of fish from Force Lake every year for 25 years. The lowest fish consumption rate assumed that a person would eat three meals of fish from Force Lake every year for 25 years. If someone could eat 28 meals every year from Force Lake, the estimated extra cancer risk is 1 in 10,000.

Force Lake Fishing

EPA does not believe that the population of fish in Force Lake could really sustain this higher fish consumption rate. If we calculate that someone could realistically consume only three to six meals a year from Force Lake, then the estimated extra cancer risk is only 1 in 100,000.

The low number of fish in the lake is not a result of chemical releases from the facility. The shallow water, limited habitat, and lack of carnivorous fish result in a stunted fishery. Force Lake does not supply sufficient fish to justify the highest fish consumption rate in our risk assessment.

Public access to Force Lake is also limited by the surrounding wetlands and by the Heron Lakes Golf Club. Access to the lake is only along the east side and the southern corner of the lake. Based on the fish surveys and the limited public access, Force Lake cannot sustain a high level of fish consumption.

Nevertheless, EPA's risk assessment includes the health risk of eating up to 28 meals per year from Force Lake, the highest estimate. Even at this high consumption rate, contaminant levels in Force Lake do not pose an unacceptable risk.

Future Residents

The risk assessment included a screening-level estimate of the possible health risks if the site was changed to residential housing. The risk assessment compared chemical concentrations in soils and groundwater to regional screening levels.

We evaluated exposures from people breathing in, eating, and touching the site contaminants. For future residents at the site, the total extra cancer risks would be higher than 1 in 10,000, and hazard quotients for some chemicals would be higher than 1.

If there are homes on this site in the future, the contamination could pose an unacceptable health risk for residents since their exposures could be higher than for workers at the facility.

If homes were built at this site, only then could the site contamination pose an unacceptable health risk for people. To build homes at the site in the future would destroy the wetlands and would require significant changes in the current local land use laws, not to mention bringing in fill to build on.

Future land use

The current and anticipated future use of this site is industrial and open space. The site is within an area designated as an Industrial Sanctuary by the city of Portland. This site is surrounded by protected wetlands and open space.

All indications are that this site will remain in industrial and open space use. We expect this area to remain in industrial and open space uses in the future. Based on the current and future land use, the health risks for industrial workers and recreational users of Force Lake are within EPA's acceptable risk range.

Ecological Risk

For Harbor Oil we calculated the site risks to wildlife in an "Ecological Risk Assessment." We estimated how earthworms, insects, fish, and other wildlife could be exposed to site chemicals through their diet, from wetland soil, or from water or sediment in Force Lake. **Table 4** shows the results of the ecological risk assessment.

We used conservative levels, or reference values, to make sure that the risk estimates, despite the uncertainties, will protect wildlife. Reference values are similar to screening values. Reference values are not the same as cleanup levels. We use reference values only to estimate risk and help us focus our investigation. The risk assessment also considers other factors, such as whether or not we find insects or worms living in the soil, and how often we find contaminants higher than the reference values.

Risk to wildlife

The ecological risk assessment has a summary of hazard quotients for animals of concern on the site. For at least one animal the hazard quotients were higher than 1 for chromium, copper, zinc, mercury, DDTs, and total HPAHs. Insects that live in water and lake sediment had hazard quotients up to 7.2 for DDD and up to 22 for DDE. DDD and DDE are breakdown products of DDT. For earthworms and insects in soil, the hazard quotients are higher than 1 for metals and PAHs.

However, for exposure to zinc and total HPAHs, the hazard quotients are less than 10. The hazard quotients are 25 for copper and 75 for chromium. The higher hazard quotients for insects and earthworms from copper and chromium are probably overestimated. This is because for copper, more than half of the soil samples had less copper than is found naturally or in the "background" in that area.

Conservative Estimates

We probably overestimated the risk from chromium, because the reference value we used to calculate the hazard quotient was a highly toxic form of chromium, chromium VI, which is not at this site. Most of the soil samples had less chromium than background levels in that area.

Earthworms were present in most of the soil sample locations, even at the locations with the highest copper and chromium concentrations. This means that the risk assessment probably overestimated the actual ecological risks from these contaminants.

For fish, mammals and birds, most of the contaminants we detected did not exceed reference values. The effects from those contaminants are unlikely to have significant impacts on soil organisms. For contaminants that were above reference values, the hazard quotients were below 10, except for mercury.

However, for mercury, the hazard quotient is less than the risks from background mercury levels found in that area. We do not believe that these chemicals have unacceptable risks to wildlife because there is such a limited area impacted by these chemicals, compared to the available wildlife habitat.

Contaminants Below Federal Standards

We also compared the sample results to chemical-specific standards, such as federal water quality standards, to define acceptable risk levels for aquatic organisms. Only copper was above the federal water quality standard, but in only one surface water sample from Force Lake.

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Table 4. Ecological risks with Hazard Quotient above 1.0

Chemical	Matrix	HQ based on No-observed-adverse-effect level	HQ based on Lowest-observed-adverse-effect level	Background or Reference Area[a] HQ based on Lowest-observed-adverse-effect level
Aquatic Benthic Invertebrate Community				
DDD	surface sediment	**2.4 – 17**	1.0 – **7.2**	0.072 – 0.79
DDE	surface sediment	**6.4 – 110**	**1.3 – 22**	1.0 – 1.5
Terrestrial Invertebrate Community				
Chromium	wetland soil	**3.3 – 75**		**21**
Copper	wetland soil	0.21 – **25**		0.72
Zinc	wetland soil	0.31 – **6.2**		0.72
Total HPAHs	wetland soil	0.0056 – **3.2**		0.003 – 0.022
Fish – Pumpkinseed				
Copper	diet	**3.5**	**1.8**	0.30
Fish – Brown Bullhead				
Copper	diet	**2.1**	**1.1**	0.18
Birds – Red-Tailed Hawk				
Total DDTs	diet	**5.8**	**1.2**	0.020 – 0.47
Mammals – Eastern Cottontail				
Mercury	diet	**5.9**	**1.2**	0.54
Mammals – Shrew				
Mercury	diet	**65**	**13**	**5.7 – 15**
Total DDTs	diet	**9.2**	**8.5**	0.053 – 0.41

[a] Background and reference area concentrations are in Attachment 4 of the Ecological Risk Assessment (Appendix J). Metal concentrations are representative of background concentrations. Organic compounds concentrations are representative of reference area concentrations.

HPAH: high-molecular-weight polycyclic aromatic hydrocarbon. Bold identifies Hazard Quotients greater than 1.0.

Low Risk to Wildlife and Environment

There are uncertainties in our ecological risk estimate because we probably overestimated risk by using conservative screening levels for insects and worms.

We found earthworms in areas with metal concentrations higher than screening levels, which shows that the screening levels are conservative in predicting risk.

The risk assessment also did not account for the high organic carbon content of the Force Lake sediments, which limit the effect of some contaminants.

Based on the information gathered during the remedial investigation, EPA believes the contamination levels here do not pose unacceptable risks to the environment.

Working with Stakeholders

EPA is the lead agency for CERCLA at this site and the Oregon Department of Environmental Quality is the support agency. EPA has worked with the Oregon DEQ, the Nez Perce Tribe, the Yakama Nation, and the Harbor Oil Voluntary Group to complete the investigations, risk assessments, and evaluations leading to our proposed decision.

The Oregon DEQ has been involved with the site for many years, conducting inspections and issuing permits. At this time, Oregon DEQ does not consider contamination at the site to be severe, and likely not of Superfund caliber.

Oregon DEQ disagrees with our conclusion that site contamination does not pose an unacceptable risk, because concentrations of some contaminants are above Oregon's cleanup levels.

Although EPA is not proposing an action under CERCLA, this does not prevent Oregon DEQ from taking action at this site under its rules.

EPA participated in multiple meetings with stakeholders during the remedial investigation to share information and hear concerns. We shared early information and draft documents throughout our investigation to help inform and engage all stakeholders.

Community members formed the Harbor Oil Community Advisory Group to learn about the site and share issues and concerns with EPA. EPA awarded a technical assistance grant to the HOCAG to fund technical advisors to review our technical site documents.

Summary of our Investigation

We found no significant environmental impacts from the site contamination. Out of the hundreds of samples tested from over 140 locations in the lakes, sediments, wetlands and groundwater, few chemicals were near or above federal standards.

The chemicals we detected above the federal standards were on the facility and they were very infrequent or not related to the site contamination.

The few chemicals detected above the federal drinking water standard were all infrequent, or they were not connected or not related to contamination from the site.

Based on the information gathered during the Harbor Oil remedial investigation, EPA believes the site contamination does not pose unacceptable risks to people's health or to the environment. Based on our remedial investigation, our review of all available data, and the expected land use, we propose that no cleanup is required under CERCLA for the Harbor Oil site. All indications are that this site will remain in industrial and open space use. Because we expect this site to remain as industrial and open space, we do not need to implement land use restrictions, or other institutional controls, to prevent future residential use.

What Happens Next?

The public comment period on this proposed plan ends on **December 14, 2012.** We will make a final decision after considering all public comments we receive during the comment period. We will respond to public comments in our final record of decision.

If EPA's final decision is that no cleanup is required under CERCLA for the Harbor Oil site, we can propose to delete the site from the Superfund National Priorities List.

If we propose to delete this site from the National Priorities List, we will publish a notice in the Federal Register and the local newspaper for public comment. Oregon DEQ must concur with EPA before we can propose to delete a site from the National Priorities List.

For More Information

Information locations

Historic Kenton Firehouse
8105 North Brandon St.
Portland, OR 97217
☎ 503-823-0215

EPA Superfund Records Center
1200 6th Ave.
Seattle, WA 98101-3140
(Please Call for Appointment)
1-800-484-4372, ext. -1478

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TTY users please call the Federal Relay Service: (800) 877-8339 and ask for Suzanne Skadowski