

Appendix B

DEQ Identification of Potential Upland Contaminant Sources

This document provides information and technical assistance to the public and employees of the Department of Environmental Quality regarding the Department's cleanup program. The information should be interpreted and used in a manner that is fully consistent with the state's environmental cleanup laws and implementing rules. This document does not constitute rulemaking by the Environmental Quality Commission, and may not be relied upon to create a right or benefit, substantive or procedural, enforceable in law or equity, by any person, including the Department. The Department may take action at variance with this document.

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Appendix B DEQ Identification of Potential Upland Contaminant Sources

B.1 Background

This Appendix describes the Oregon Department of Environmental Quality's (DEQ) process for identifying potential sources of contamination to Willamette River within the Portland Harbor Superfund site and is provided for informational purposes only.

Under the Memorandum of Understanding (MOU), DEQ is responsible for the identification and control of contaminant sources to Portland Harbor. The United States Environmental Protection Agency (EPA) is responsible for investigating the nature and extent of in-water contamination, estimating the risks to human health and the environment from exposure to the in-water contamination, identifying and evaluating remedial action alternatives, and selecting a remedial action to address in-water contamination.

The EPA has entered into an Administrative Order on Consent (AOC) with a group of responsible parties known as the Lower Willamette Group (LWG). Under the terms of the AOC, the LWG is responsible for the performance of a remedial investigation and feasibility study (RI/FS) that addresses the in-water portion of the site. The work plan for the RI/FS was approved by EPA in April 2004.

This Appendix supports the Joint Source Control Strategy and identifies how DEQ will identify potential upland sources of contamination threatening the river as required by the MOU. DEQ will require individual upland potentially responsible parties (PRPs) to identify, evaluate, and control, to the extent feasible, the release of contaminants to Portland Harbor. This appendix contains the framework for identifying sources. Appendix B describes DEQ's expectations for characterization of sites identified as potential sources.

B.2 Sources of Contaminants in Sediment

Potential sources of hazardous substance that may impact the river include but is not limited to:

- Upland sites being investigated under DEQ Cleanup Authority (ORS 465);
- Overwater activities;
- Permitted and unpermitted storm water discharges;
- Other permitted discharges;
- Overland run-off and other non-point sources;
- Direct discharges resulting from spills and other over or in-water releases; and
- Upstream releases, emissions and discharges.

Examples of Potential Contaminant Sources

- Historic Waste Disposal: Historic waste disposal practices (e.g., spills, disposal ponds, land filling). Hazardous substances that may reach the Willamette River via bank erosion, storm water runoff, or leaching to groundwater.
- Spills and Leaks: Releases from pipelines, tanks, or drums are examples of unpermitted sources that may occur at any time and enter the river through a variety of pathways.
- Ongoing and Historic Harbor Operations: Releases during loading and unloading, refueling, or ship maintenance activities may result in the direct discharge of petroleum products and other materials.
- Point Sources: Permitted and unpermitted discharges through pipes to the river. Permitted discharges include storm water, industrial process water, non-contact cooling water, boiler blowdown water, and treated groundwater discharges.
- Non-Point Sources: Non-point sources are limited within the harbor. Contaminants from non-point sources within the boundaries of Portland Harbor are generally from riverbank erosion or sheet flow across properties located directly on the river.

B.3 Contaminants Detected in Portland Harbor Sediment

Contaminants that have been detected in sediment samples from Portland Harbor, prior to completion of the Round 2A sediment sampling performed by the LWG in the Summer of 2004, include but is not limited to the following:

- Metals: Arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc have been detected throughout the harbor. Elevated metal concentrations have been detected in ship berth slips, adjacent to current and historic ship maintenance operations (e.g., Mar Com Marine, Willamette Cove, and Portland Shipyard), and near some of the municipal outfalls. Elevated levels of organo-tin compounds were detected adjacent to current or former ship maintenance operations.
- Polynuclear Aromatic Hydrocarbons (PAHs) and Semivolatile Organic Compounds (SVOCs): SVOCs (primarily PAHs) have been detected throughout Portland Harbor. The highest concentrations are generally found downstream of RM 7.5. Facilities in this reach of the river that may have contributed to PAH sediment contamination include McCormick and Baxter, GASCO, and numerous bulk fuel facilities that line the Willamette River from RM 4 to RM 8. PAHs are also common constituents in urban storm water runoff and are associated with oil, coal, creosote, and a variety of petroleum products.
- Chlorinated Pesticides: DDT and its breakdown products, DDE and DDD, are the most commonly detected chlorinated pesticides within Portland Harbor. Although they have been detected throughout Portland Harbor, sediment concentrations are highest downstream of the ATOFINA and Rhone Poulenc sites, both former pesticide manufacturers.

- Chlorinated Herbicides: Limited data are available for chlorinated herbicides within Portland Harbor. 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4-dichlorophenoxy butyric acid (2,4-DB) were detected downstream of the Rhone Poulenc site, a former herbicide manufacturer.
- Polychlorinated dibenzo-p-dioxins and furans (PCDD/PCDF): These compounds have been detected in Portland Harbor sediment. Most samples have been collected adjacent to the Rhone Poulenc and McCormick and Baxter sites, which are known upland sources of PCDD/PCDF contamination.
- Phthalates: Phthalates are found throughout the harbor. They are associated with plastics and may be associated with urban storm water runoff.
- Total Petroleum Hydrocarbons (TPH): Facilities in the ISA that may be contributing to TPH sediment contamination include McCormick and Baxter, GASCO, and numerous bulk fuel facilities that line the Willamette River from RM 4 to RM 8. TPH is likely a constituent in urban storm water runoff and is associated with gasoline, diesel, oil, coal, creosote, and a variety of other petroleum products.
- Polychlorinated Biphenyls (PCBs). PCBs have been detected throughout Portland Harbor.
- Other. Additional contaminants have been detected in soil or groundwater at upland facilities, including perchlorate, benzene, toluene, chlorobenzene, and hexavalent chromium. As additional contaminants are identified through the upland investigations, additional in-water sampling be needed to assess potential impacts to the Willamette River.

Detailed information on sediment data, including location maps, is available in the Portland Harbor RI/FS Work Plan (LWG., 2004a) and the Field Sampling Plan (LWG., 2004c). Additional sediment samples will be collected by the LWG as the in-water remedial investigation continues. Data from those samples may result in an expansion of the contaminant list summarized above.

B.4 Contaminants Detected at Upland Sites

Contaminants of interest (COIs) for the upland investigations include any hazardous substance that may have been used, stored, or generated during current or historic operations at site. COIs are identified during site investigations and are based on current or historic use of hazardous substances at a facility and on existing upland soil, groundwater, or other environmental data. Sediment data collected adjacent to upland sites as well as chemical fate and transport properties (e.g., breakdown products, geochemistry) will also be considered when identifying COIs.

COIs, at upland sites¹, detected to date include PAHs, PCBs, PCDD/PCDF, pesticides, phenols, phthalates, total petroleum hydrocarbons (TPH), aromatic and chlorinated volatile organic

¹ The latest update of this table is available on DEQ's Website at <http://www.deq.state.or.us/nwr/phsummary.pdf>.

compounds (VOCs), herbicides, organo-tin compounds, and metals. Some COIs are present at a limited number of upland sites and may still pose localized risks in Portland Harbor. These COIs include, but are not limited to:

- Perchlorate;
- Hexavalent chromium; and
- Trichloroethene (TCE) and its associated breakdown products.

B.5 Upland Site Investigation Process

In general, DEQ's site discovery (i.e., site identification process) process started by broadly looking at current and historic facilities with the Portland Harbor Basin. Facilities with current or historic business operations or processes that could potentially release hazardous substances into the environment are captured as "potential sources." DEQ staff examines sites where releases of hazardous substances have occurred or may have occurred, to determine if these sites have the potential to impact human health or the environment. DEQ's site identification process is described in the following sections.

DEQ's Site Assessment Components Are:

- Discovery
- Site Screening
- Preliminary Assessment
- Expanded Preliminary Assessment
- Remedial Investigation
- Entry into DEQ ECSI Databas

B.5.1 Site Discovery

Discovery refers to how DEQ staff learns of contaminated or potentially contaminated properties. DEQ evaluates many property types, from small commercial lots to roadside chemical spills to large industrial facilities. DEQ assesses all hazardous substances that can contaminate soil, surface water, sediments, groundwater, or air.

During site discovery, DEQ performs quick reviews of readily available site information and identify those sites with the greatest potential to threaten human health and/or the environment. At this time, DEQ adds new sites to DEQ's Environmental Cleanup Site Information (ECSI) database². ECSI is an electronic tracking system for contaminated or potentially contaminated sites, which is updated as sites progress through different stages of the cleanup process.

Potential upland sources of contamination within the Portland Harbor Basin are identified by using multiple sources of information, including but not limited to the following:

² ECSI can be searched using DEQ's website at <http://www.deq.state.or.us/wmc/ECSI/ecsiquery.htm>.

- Referrals from other DEQ programs or from other public agencies;
- Evaluation of Willamette River sediment data;
- Contamination appearing on adjacent properties;
- Data submitted voluntarily by property owners or their representatives;
- DEQ staff research to discover sites that could affect Vulnerable Areas including review of DEQ files and databases including but not limited to the following:
 - Identification of facilities immediately adjacent to the river;
 - Identification of facilities within private and municipal storm water drainage basins;
 - Cleanup Files; Site Assessment Files;
 - Water Quality files;
 - Spill reports;
 - Citizen complaints;
 - Hazardous Waste Generator files;
 - Solid Waste Files;
 - Underground Storage Tank files;
 - Air Quality files, and
 - Field Reconnaissance (visual identification);
- Other federal, state, or local government records including:
 - EPA CERLIS information;
 - Oregon State Fire Marshall List;
 - Historic maps or aerial photographs; and
 - City of Portland Storm water Inspection/monitoring reports.

Based on the results of DEQ's site discovery process, sites are selected by DEQ staff for further evaluation based on known information and best professional judgment of potential threats or current or historical releases from these facilities. Sites that are found to be or are suspected to be contaminated by hazardous substances are then prioritized for further DEQ assessment.

DEQ initiated an extensive site discovery program in 1998 and continues to identify potential sources through its Site Assessment (SA) and Portland Harbor Cleanup Sections. The discovery activities initially focused on facilities along the banks of the Willamette River within the boundaries of the 1997 Portland Harbor Site Investigation (Weston, 1997) and in the Rivergate district located downstream from river mile 3.5 on the east side of the river. Site discovery activities are currently focused on facilities within City of Portland municipal storm water conveyance basins within the ISA.

B.5.2 Preliminary Site Screening

Site Assessment's first documented action at a site is called a **screening**. A screening is a brief review of readily available information on site history, contamination, and ways that human or environmental receptors could be exposed to site contamination. Screenings are primarily "desktop" exercises that occasionally include site visits, but rarely involve DEQ sampling. Typically, at this stage, DEQ will issue an information request letter in accordance with its cleanup authority, to obtain information regarding current and historic use of hazardous substances. Screenings culminate in general recommendations for further site action that include

priority rankings. Screenings are usually documented in written DEQ Strategy Recommendations.

Strategy recommendations are based on a detailed review of existing information. The goal is to determine whether a specific hazardous substance release or a specific past operation at the site has impacted, has likely impacted, or has the potential to impact media at the site. For the purposes of this source control strategy, the evaluation is focused specifically on the potential for impacts to Willamette River sediments.

DEQ strategy recommendations include detailed information on the following:

- Site description;
- Operational and regulatory history;
- Evaluation of current and historical uses of the property (Note: the history of Portland Harbor sites is typically reviewed back to the early 1900's);
- Results of any environmental investigations performed at the site;
- Summary of DEQ program files;
- An evaluation of potential exposure pathways; and
- Recommendations for further action.

Conclusions and recommendations for next steps are also provided in the strategy recommendation. Sites are scored using DEQ's site assessment prioritizing system (SAPS) to determine their priority for additional investigation. Priorities (low, medium, or high) are assigned based on the threats posed by contamination and the urgency for implementing further remedial actions. Sites with the potential for contaminant discharges to Portland Harbor are identified as high priority sites. Those without the potential for ongoing contaminant discharges to the harbor are evaluated based on the potential threats to upland receptors.

Depending on the amount of information available and the nature of site contamination, DEQ may recommend that the property owner conduct a Preliminary Assessment (PA), a PA with sampling (a.k.a., expanded PA or XPA), a site investigation (SI), a remedial investigation (RI), or an RI with a feasibility study (FS) to evaluate cleanup options. At some sites, all that is needed is further documentation or analysis to demonstrate that hazardous substances pose no significant threats. At a few other sites, DEQ staff may be able to determine from existing documentation that no further action is necessary. Depending on site conditions and the assigned priority, DEQ may offer facility owners and operators the following options for further action: 1) participate in DEQ's Voluntary Cleanup Program; 2) conduct further actions independently (i.e., without DEQ involvement); or 3) wait for DEQ's Site Response Section to initiate further action under the state's enforcement authority (high priority sites only).

Site screening efforts within Portland Harbor initially focused on shoreline sites located between RM 0.5 and RM 11. In order for sites that are set back from the Willamette River to be sources of contamination to the river sediment, a contaminant migration pathway must exist from the site to the river. As discussed in Section B.4.1, primary migration pathways to the river include storm water or surface water discharges, groundwater migration, and preferential pathways along utility lines. For sites set back from the Willamette River shoreline, the primary migration pathway is expected to be storm water. As a result, current DEQ site discovery activities are

focused on non-shoreline sites that discharge to public and private storm water conveyance systems.

B.5.3 Preliminary Assessments

At high priority sites where a release may have occurred or the threat of a release exists, DEQ staff will conduct or require a PRP to conduct a Preliminary Assessment (PA). This involves a detailed evaluation of the facilities current and historical operational history, waste management practices, identification of potential source area; past sampling data (if available), and potential exposure pathways. PAs incorporate site visits and sometimes include limited sampling. However, sampling at this stage more commonly occurs during an Expanded Preliminary Assessment (XPA), which is designed to confirm the presence of contamination when a previously completed PA lacks such information.

The information collected during a PA is used to reassess the potential for the site to adversely impact the Willamette River. If it appears that a site may be impacting the river, DEQ will assign a high priority to the site and require additional investigation by means of an XPA or a RI (described below). High priority XPAs or RIs are conducted either under voluntary agreements or enforcement orders as discussed in Sections B.5.4 and B.5.5, respectively.

Medium or low priority sites are allowed to perform the work independently or through the DEQ Voluntary Cleanup Program. DEQ will not typically take enforcement action at low or medium priority sites, if the responsible parties refuse to perform the necessary work. However, the DEQ will continue to re-evaluate these sites as more information becomes available and can change the site priority if warranted.

B.5.4 Preliminary Assessment with Sampling

If additional data are needed to determine if a facility is a current source of contamination to the river, DEQ will require the upland responsible party to perform a preliminary assessment with sampling (XPA). If an upland PRP refuses to perform a preliminary assessment, the DEQ will use its enforcement authority to compel the required work or will declare the site a DEQ orphan site, and then perform the work using its environmental contractors.

The XPA should identify all upland, in-water, and over-water activities that might have resulted in the release of hazardous substances. Sufficient samples should be collected to determine if a release of hazardous substances has occurred and if they pose a potential threat to the river and its sediment. If so, DEQ will assign a high priority for a RI as described in Section B.5.5.

If it can be demonstrated based on the results of the XPA that a facility is not an ongoing (i.e., current) source of contamination to the river, DEQ may reprioritize the site and issue a determination stating that source control measures are not required at this time. The site will then be referred to the DEQ cleanup program to address upland issues unrelated to Portland Harbor and to EPA for evaluation of potential historic sources of in-water contamination.

B.5.5 Remedial Investigation and Source Control Measures

A **remedial investigation** (RI) is a detailed study that may include groundwater, soil, sediment, or surface water sampling to determine the nature and extent of contamination at a site. The RI emphasizes data collection and site characterization including sampling and monitoring as necessary to gather sufficient information to determine the necessity for remedial action and to support the risk assessment which estimates risks to human health and the environment as a result of the contamination. The RI also provides site-specific information to evaluate cleanup alternatives evaluated in a Feasibility Study (FS) or Source Control Evaluation (SCE).

DEQ has initiated approximately 60 RIs in the Portland Harbor area. Upland RIs started since 2000 are generally performed under a Voluntary Cleanup Agreement and Scope of Work (SOW) developed specifically for Portland Harbor sites in accordance with the MOU. The RI agreement requires PRPs to perform an upland RI designed to characterize all sources and pathways of contamination to the Willamette River and to evaluate, design, and implement necessary source control measures (See Section 4.0 of the JSCS). Site characterization elements required by DEQ for Portland Harbor sites are discussed in Appendix C.

The Portland Harbor RI agreement distinguishes between the upland and in-water portions of the cleanup site and explicitly states that the portion of the site below the mean high-water mark of the Willamette River should be excluded from this work. The in-water portion of the investigation will take place under EPA oversight in accordance with EPA's AOC with the LWG for the Portland Harbor Sediment RI/FS.

Although many elements of the RI are focused solely on the upland portion of the site, the SOW requires the evaluation of all contaminant migration pathways at the site, particularly those related to the Willamette River. This may include the collection of sediment and/or pore water data from below the high-water mark³ to characterize and evaluate groundwater or storm water discharges to the river.

The RI should include two distinct elements: (1) the investigation and assessment of upland contamination unrelated to Portland Harbor, and (2) the identification and characterization of sources and pathways of contamination to the river and sediment. It is beyond the scope of this source control strategy to outline the process for upland investigations unrelated to Portland Harbor. However, specific site characterization elements required by DEQ for Portland Harbor sites are discussed in Appendix C.

High priority remedial investigations are performed under DEQ voluntary agreements or enforcement orders. If the PRP refuses to perform the RI, DEQ will issue a unilateral order for the performance of the necessary investigation and cleanup work, as discussed in Volume 2 of the JSCS. If the RP refuses to comply with the unilateral order, DEQ has the options of

³ For Portland Harbor upland projects, DEQ has chosen to provide an initial definition of an upland harbor site boundary using one elevation for consistency and to minimize gaps in river bank evaluations. DEQ's initial definition is 8 feet Columbia River Datum (9.85 feet National Geodetic Vertical Datum) as measured on the USGS Morrison Bridge river gauge. This starting point elevation definition should be combined with site-specific discretionary modifications.

enforcing the order, declaring the site an orphan site and performing the work itself, or referring the site to EPA. If DEQ performs the removal or remedial action, the RP will be liable for the cost of the action, plus punitive damages equal to three times the amount of the state's costs.

B.5.6 DEQ Environmental Cleanup Site Information (ECSI) Database

A site is added to DEQ's Environmental Cleanup Site Information (ECSI) Database when DEQ learns that it is contaminated or potentially contaminated with hazardous substances such as solvents, metals, PCBs, or petroleum hydrocarbons. Such site information comes from a number of sources, as described in Section B.5.1. Because ECSI includes *potentially* contaminated sites as well as sites known to be contaminated, appearance on the ECSI database does not necessarily mean that a site is contaminated.

For tracking contaminated sites, DEQ's ECSI database can be considered roughly equivalent to EPA's *CERCLIS* database. However, there are important differences between the two:

1. In contrast to ECSI, CERCLIS is a formal, statutory list that sets in motion certain required activities and timelines.
2. EPA generally adds sites with *confirmed* contamination to CERCLIS, while DEQ adds to ECSI sites with *suspected* contamination as well as those with confirmed contamination.
3. Unlike ECSI, CERCLIS specifically excludes sites with petroleum-only contamination.
4. All CERCLIS (or former CERCLIS) sites in Oregon are added to ECSI, but most ECSI sites are not added to CERCLIS.
5. EPA's cleanup process uses an "all or nothing" approach – following EPA evaluation, sites in CERCLIS are either proposed for the Superfund list or designated as No Further Remedial Action Planned ("NFRAP"), and transferred to the CERCLIS archives. On the other hand, Oregon recognizes a continuum of site cleanup needs and priorities and will often determine that federal NFRAP sites require further state action.

B.6 Identification and Control of Upstream Contaminant Sources

Existing sediment data and sediment data collected during the Portland Harbor RI/FS will be evaluated to determine if upstream sources are contributing significantly to contamination of the harbor sediment. Data to be evaluated include upstream and reference site sediment samples, and storm water and other discharge data generated through DEQ's Water Quality program. If it is determined that upstream contributions could result in the recontamination of Portland Harbor following remediation activities, or otherwise represent a threat to human health and the environment, DEQ will work with the appropriate regulatory authorities to identify and control specific sources of the contamination. Potential upland sources that will be considered include storm water discharges, DEQ cleanup sites, non-point sources, etc.

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